



STAKEHOLDER STUDY: RESOURCE MANAGEMENT OF WAIRARAPA MOANA

Identification and Analysis of Wairarapa Moana
Stakeholder Opinions Regarding the Management
of the Blundell Barrage Gates

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Abstract

This project aided the Greater Wellington Regional Council (GWRC) in collecting opinions from five stakeholder groups concerning management of the naturally flooding Lake Wairarapa in New Zealand. Our team conducted a total of twenty-nine interviews with the Rangitāne (Māori), Department of Conservation, South Wairarapa District Council, landowners, and recreational water users regarding the Blundell Barrage Gates which play a vital role in flood management. Interview discussions indicate that water quality, sources of pollution, water levels, flood management, and future operation of the barrage gates are controversial. We identified communication, collaboration, and education as three areas of focus for the GWRC as they continue to improve their management of the region.

Executive Summary

This project is concerned with Wairarapa Moana, a water system located in the Wairarapa region, situated on the North Island of New Zealand. Wairarapa Moana consists of the three main water bodies, shown in Figure 1; the coastal lake is Lake Onoke, the inland lake is Lake Wairarapa, and the main river is the Ruamahanga. The system is dynamic, which means water can flow in both directions. Both tidal movements and rainfall affect the direction of flow. The area is low-lying and sits between two mountain ranges exposing much of the land to seasonal flooding. The Greater Wellington Regional Council, the governing body for the Wellington region, developed the Lower Wairarapa Valley Development Scheme (LWVDS), to control flooding in the 1960s. This scheme includes the diversion of the Ruamahanga River around Lake Wairarapa and the implementation of the Blundell Barrage Gates as shown in Figure 1.



Figure 1 - The Lower Wairarapa Valley Development Scheme, which contains the diversion of the Ruamahanga straight into Lake Onoke and the Blundell Barrage Gates, dramatically reduced the extent of flooding, as shown in light blue (Google, 2015).

The Wairarapa community is currently experiencing a resource management conflict regarding the flood prevention scheme. The conflict involves many different stakeholders within the region. The tensions stem from the historic difference in lifestyle between the Pakeha and the indigenous Māori.

Pakeha refers to non-Māori individuals, primarily English colonists who began settling in the Wairarapa region in the 1840s. The British Crown and the Māori signed the Treaty of Waitangi in 1840, which established British sovereignty over New Zealand. Over the years, it became clear that the Māori and the Pakeha valued the land differently. Where the Māori value the land for its intrinsic value, the Pakeha generally value the land for its economic value. In Wairarapa Moana, the land would routinely flood and drain. Conflicts arose around ownership of the lake bed and who would control the flooding of the lake. The farmers desired flood control in order to protect their assets, land and animals, and the Māori desired higher water levels for catching eels. Inevitably, pressure from the British Crown to sell, left the Māori no choice but to gift their land to the Crown in 1896. In 1975, the government formed the Waitangi Tribunal in

order to hear claims of breaches in the Treaty of Waitangi. Rangitāne o Wairarapa, a local Māori tribe or *iwi*, initiated a settlement claim with the Office of Treaty Settlements and is currently working to settle overlapping claims with a second *iwi*, the Kahungunu ki Wairarapa. The outcome from this settlement may result in the Crown gifting the lake bed back to both tribes. This could lead to greater *iwi* involvement, affecting the scheme the Greater Wellington Regional Council currently uses to manage the lake.

The Greater Wellington Regional Council (GWRC) dramatically altered the landscape over the last fifty years with the implementation of the Lower Wairarapa Valley Development Scheme. The New Zealand Resource Management Act of 1991 mandates that most activities that affect the environment obtain a resource consent. The GWRC flood protection department is responsible for renewing their two resource consents for maintaining the entire scheme and operating the Blundell Barrage Gates. The resource consent that permits the usage of the barrage gates will be up for renewal in 2019 and the resource consent that permits the management of the entire Lower Wairarapa Valley Development Scheme will require renewal in 2025.

The aim of the Greater Wellington Regional Council is to utilize our team as a third party to investigate and discover the thoughts and opinions of the concerned stakeholders in the region. They tasked us with speaking to the Rangitāne o Wairarapa, the Department of Conservation, South Wairarapa District Council, landowners, and recreational water users so that they may better prepare for the resource consent renewal.

This project's focus was to detail the points of view of each stakeholder group and improve communication within the Wairarapa Moana community regarding the management of Lake Wairarapa. In order to achieve this goal, our team developed three objectives:

1. To observe and gain understanding of the current political, ecological, economic, and cultural situation in Wairarapa Moana
2. To identify the perspectives and needs of each stakeholder group regarding the management of Lake Wairarapa
3. To determine common interests, concerns, and major differences by highlighting recurring themes regarding the Blundell Barrage Gates.

To achieve our main goal of detailing the points of view of each stakeholder group, we utilized three methods: background research, interviews, and data analysis. Through observing Lake Wairarapa, a Wairarapa Coordinating Committee meeting, and a welcoming ceremony at the Kohunui Marae, the project group developed a thorough understanding of the region and community. We interviewed David Boone, the section leader of the Flood Protection Department at the GWRC, who provided us with intricate knowledge of the flood protection scheme. These activities allowed us to align our project objectives to better match the needs of the flood protection department.

After familiarizing ourselves with the region and its people, our team identified the perspectives and needs of each stakeholder group by conducting and transcribing twenty-four semi-structured interviews with twenty-nine individuals as shown in Table 1. *Semi-structured* interviews allow free discussion, containing a set list of questions, while offering flexibility to ask supplemental questions. Each stakeholder group had a unique interview protocol, which inquired about the same topics but the wording of the questions varied depending on the specific interest of the group interviewed.

Table 1 - Stakeholder Breakdown

Stakeholder Interviewee Breakdown (29 total):	
Department of Conservation:	7
Rangitāne o Wairarapa:	4
South Wairarapa District Council:	6
Landowners:	8
Recreational Water Users:	4

After we completed the interviews, we coded the information by recurring themes in the responses. Independently, three group members each coded roughly a third of the transcripts from the interviews and the last member reviewed, summarized and sorted the coded data into the respective topics. This allowed us to transform our qualitative raw data into quantitative data and draw conclusions regarding common and differing interests of each stakeholder group.

Our data and analysis highlights five key points of contention: water quality perceptions, sources of pollution, flood management, future operation of the scheme and water levels. For stakeholder perceptions of water quality, only two respondents indicated that the current quality of the water was good. The breakdown of responses by stakeholder is shown below in Figure 2, which indicates that generally, interviewees thought that the water quality was poor or neutral.

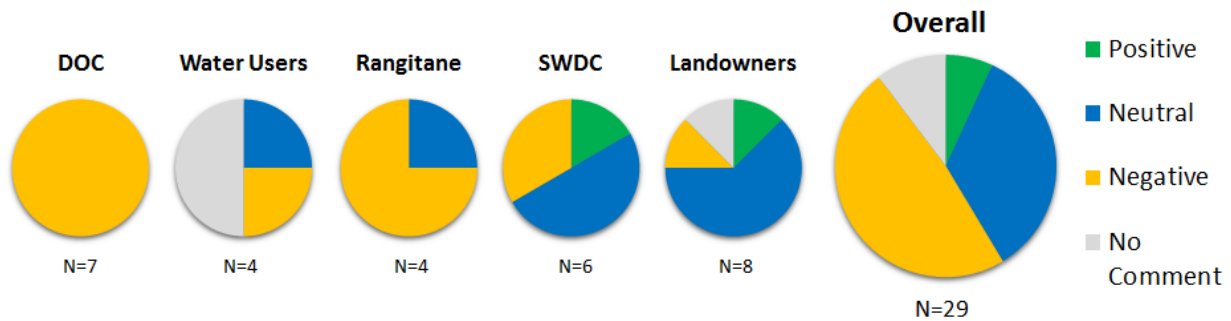


Figure 2 - Table of water quality perceptions

It was brought to our attention, before the start of the interviews, that the public generally considered farming practices as a main cause for the poor water quality in the region. However, the interviewees noted several other factors that affect the quality of the water. If at least fifty percent of a stakeholder group mentioned a factor of water quality, we noted it and included it in Figure 3, below. Nineteen out of the twenty-nine interviewees acknowledged the impact farming practices has, however they also noted that the natural behavior of the lake, reduced flow, and wastewater discharge have a significant impact.

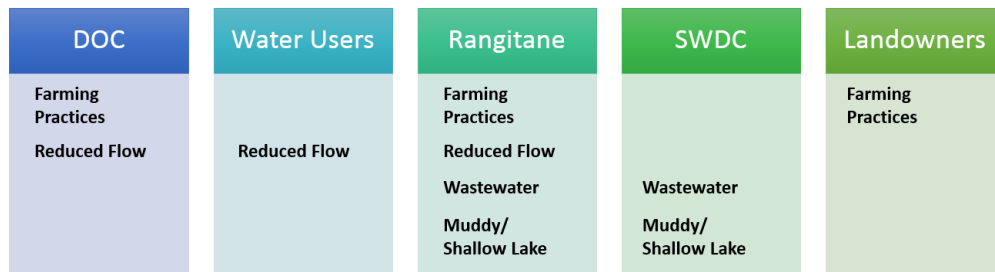


Figure 3 - Diagram of flood management perceptions

The team identified flood management as another point of contention. We analyzed whether each interviewee thought the GWRC well manages the scheme or not. The breakdown of responses by stakeholder is shown below in Figure 4, which shows that generally, interviewees thought that the GWRC manages flooding well. The only stakeholder with 50% or more who thought the GWRC did not manage the flooding well was the Rangitane.

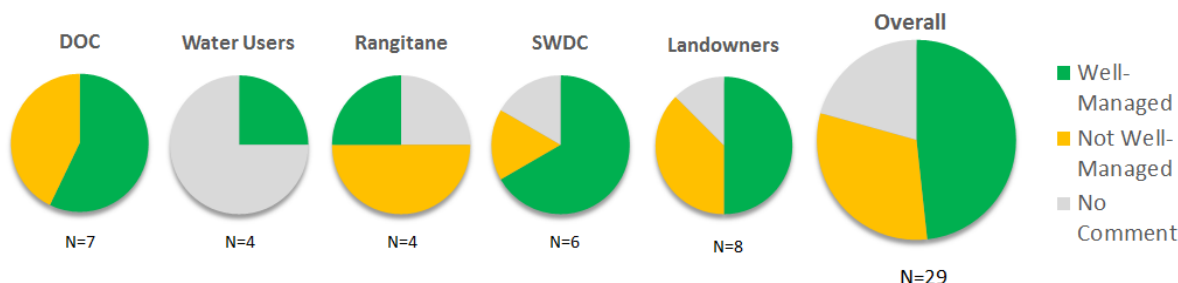


Figure 4 - Table of flood management perceptions

When asked how the GWRC could improve their management of the Lower Wairarapa Valley Development Scheme, the interviewees expressed different priorities for the future. Twenty-three out of twenty-nine interviewees expressed that they wanted the GWRC to address water levels. Eighteen of the respondents mentioned that they desired some alteration in the flow of water through Wairarapa Moana. Eleven interviewees were interested in the fish passage while four stated that they would like more technological improvements.

When discussing what changes the interviewees would like to see regarding the water levels of the lake, fifteen of the twenty-nine interviewees communicated flood protection as one of their priorities. This was the dominating response and not just among landowners, the primary beneficiaries of the scheme, but among the other stakeholder groups as well. The interviewees mentioned other topics for consideration when setting the water levels, including wetlands, natural flow, recreation and fish life. The GWRC should take these ideas into account when considering water levels for the upcoming resource consent.

We asked the interviewees what changes they would like to see occur with the way the GWRC manages the lake. Overall, eleven out of the twenty-nine interviewees stated that they would like more attention towards scientific research going forward. Seven out of the twenty-nine interviewees thought that the GWRC should focus more on improving iwi relationships. The data suggests that 75% of the Rangitane interviewees share this view, and would like the GWRC to increase Rangitane involvement with the decision making process.

Our stakeholder study highlighted three sources of contention in the region: communication, collaboration, and education. We first experienced the communication issues during the Wairarapa Moana Coordinating Committee, when two farmers resigned due to

inaccurate media representations of farming practices and water quality. Later, our interviews and results further stressed that the Wairarapa community felt there was a lack of communication between stakeholders and the Greater Wellington Regional Council.

Collaboration is the second source of contention. Even though relationships between the Rangitāne and management groups such as the GWRC and DOC are improving, there is little co-management involving the iwi. Additionally, both Rangitāne and farmers believe that the GWRC does not take their input into account when making decisions. Interviewees stated the need for people in management who understand the area, are passionate, and are “good people.”

The third source of contention is education. Our responses show on average 43% of the interviews did not provide a response for some of our topics. This, combined with the qualitative data we collected, suggests that many individuals are not aware of the current management practices of the Lower Wairarapa Valley Development Scheme. The GWRC should make efforts towards amending this.

An important finding from our study involves the Ruamahanga Cutoff. The cutoff is a stagnant body of water that used to connect the Ruamahanga River and Lake Wairarapa. The implementation of the Lower Wairarapa Valley Development Scheme indirectly left this body of water stagnant. This is optimal as a practice location for select interviewees of the recreational water users group. In an effort to improve water quality, one farmer plans to remove part of the barrier between the cutoff and lake. This will ultimately render the cutoff unfit for skiing, due to the fluctuating water levels. From our interviews, we found that water-skiers did not know about the farmer’s activity and that the farmer did not know the implications of activity on the water-skiers. Although the cutoff will gain a flushing effect from the lake, it is important that all concerned stakeholders have a voice in this matter before it proceeds.

Through this project’s qualitative analysis, we determined the stakeholder’s primary concerns. Rangitāne interviewees stressed the current lack of flowing water and natural processes as well as co-management of the lake. The Department of Conservation’s main focus was the protection of native wildlife. The South Wairarapa District Council tended to regard tourism as a priority. Landowners emphasized that they need the flood protection maintained. The data suggests that the recreational water user interviewees require the preservation of the barrier between the cutoff and the lake.

The Greater Wellington Regional council sponsored this two-year project that ultimately four teams will complete. Although this project does not reflect the values of all of the stakeholders in the region, we acknowledge the similarities, differences, and concerns between the stakeholders given to us. Overall the people of Wairarapa want what is best for Wairarapa Moana. Behind the differing opinions, they share the same core values in preserving and cherishing what the region has to offer. We felt that one quote by Tony Silbery nicely summarized these ideas.

“It’s a big water store in times of flood so it’s got its role as part of the lower valley and central valley’s flood protection systems... It’s got its role as a recreational asset, fishing, shooting, birdwatching. It’s got its role as a natural asset. Different people in the community will latch onto one of those. But when you talk to them, you’ll find that they recognize all of them. For Wairarapa people, Wairarapa Moana really is the heart of the whole place and if you identify with Wairarapa, one of the first things you’ll identify with is that body of water.”

- Tony Silbery

Acknowledgements

We would like to thank everyone who influenced the outcome and success of our project. First, we would like to thank the twenty-nine total interviewees: four Rangitāne o Wairarapa, four recreational water users, six of the South Wairarapa District Council, seven of the Department of Conservation, and eight lower Wairarapa valley landowners. Specifically, we would like to show our appreciation to Ian Gunn, our project liaison, for providing us with essential resources such as interview contacts, transportation, and beneficial insight and constructive suggestions. We would like to additionally thank Ra Smith for being a cultural advisor and organizing our visit to the Kohunia Marae. Furthermore, we would like to thank Jean Gunn, Ian's wife, for transportation, photography, and hospitality. Moreover, the advice, explanations, and feedback provided from David Boone and Shawn Andrewartha has proven to be invaluable. We would like to thank Professor Beth Eddy and Professors Robert Kinicki, our on-site project advisors, for their instrumental guidance and support throughout the entire study. Furthermore, we wish to acknowledge the assistance provided by Professor Stephen McCauley, our ID 2050 professor, in preparing our preliminary (PQP) report and Laura Hanlan for providing assistance with research and citations. The knowledge and cooperation provided by each interviewee was beneficial to the success of this project. Finally, we would like to thank Greater Wellington Regional Council and Worcester Polytechnic Institute for providing us with this opportunity.

Disclaimer

This Interactive Qualifying Project was written as a requirement for the completion of a Bachelor's of Science degree from Worcester Polytechnic Institute. The authors are not experts or professionals on stakeholder research and analysis. This document was written for the Greater Wellington Regional Council and Wairarapa community. This document does not represent the opinion of the Greater Wellington Regional Council or Worcester Polytechnic Institute.

The opinions stated in this report by each of the stakeholder groups, are only a fraction of the total community. Therefore the data shown in this report does not reflect on the stakeholder group as a whole but as a majority of the individuals we interviewed.

The text that depicts the values of the Māori is our best effort at summarizing their ideas into our own words, and readers should not interpret these statements as the absolute meaning of their words. This paper includes the transcriptions of all of the interviews, so that the raw data of all of their responses can be found there.

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Chapter 1: Introduction

Resource management conflicts revolve around multiple groups desiring to control a valuable asset. Often times, these resources are necessary for life and a culture's sustainability. For instance, water is essential for life, and many communities base their entire livelihoods on the location of water (Klare, n.d.). The Olympic Peninsula in Washington houses a forest of old growth trees that is the subject of a resource management conflict. Lumbering in the region reduced most of the trees outside the protected park into tree plantations. The underlying problem revolves around the differences in the way people value resources. One party values the presence of ancient trees, whereas the other values the commodity of cutting and selling the trees. There is a disparity in how groups value the forest. Some view it as an ecological treasure, and others view it as an economic opportunity (Lambert, n.d.).

In the Wairarapa region, located on the northern island of New Zealand, the Greater Wellington Regional Council is currently dealing with a resource management conflict on a political, economic, ecological and cultural scale. The main problem revolves around the management of Lake Wairarapa, and the competing interests of those who live around the lake. Flood control is a major part of the controversy, polarizing different stakeholders in the community.

This started in the 1840s when Europeans initiated settlement around Wairarapa Moana, which consists of the three main water bodies in the region: Lake Onoke, the Ruamahanga River and Lake Wairarapa. The British Crown breached an agreement with the Māori (indigenous people) by unlawfully buying and selling Māori land. This stemmed from a conflict of livelihoods between the *Pakeha* (Europeans) and the Māori over the lake resource. The argument was essentially over “fish vs. sheep” where the Māori required high water levels for fishing and farmers required low water levels for sheep grazing. The government ultimately worked in the best interest of the farmers and developed a flood prevention scheme to keep the lake water levels low, much to the detriment of the Māori fishermen (Grant, 2012).

The resource consent that details the management plan for the lake is up for renewal in 2019. This resource consent permits the operation of the barrage gates that control the lake levels in the flood protection scheme. The Greater Wellington Regional Council, the governing body in charge of the flood prevention, is responsible for renewing the resource consent. This requires

the approval of a council, who bases their decision on the consensus of the affected stakeholders. Ultimately, the GWRC should take into consideration the points of view of each stakeholder, so that they can develop an effective compromise.

The Greater Wellington Regional Council wants to introduce a resource consent regarding the management of the Blundell Barrage Gates that accurately portrays and meets the needs of the community they serve. We worked closely with the GWRC in order to detail the points of view of affected community members. We accomplished this by interviewing a set of five stakeholder groups including Rangitāne o Wairarapa (a Māori tribe), the Department of Conservation (DOC), landowners located at the southern end of the lake, recreational water users and the South Wairarapa District Council (SWDC). We held a total of twenty-four interviews with twenty-nine interviewees: four from the Rangitāne, seven DoC representatives, eight landowners, four recreational water users and six from the SWDC. Our project team then transcribed each interview and coded each transcription in order to highlight key phrases and topics. From the coding, we were able to understand the common interests, concerns and major differences in the region.

Our data and analysis highlights five key points of discussion: water quality perceptions, sources of pollution, flood management, future operation of the scheme and water levels. The analysis provided insight into areas where stakeholders currently disagree, such as water quality, water levels, and future operation. Overall, results show communication, collaboration, and education are three main areas upon which the community and the GWRC can improve. Collectively, interviewees want to maintain the health of the region as Wairarapa Moana is a valuable treasure. Going forward, the Greater Wellington Regional Council will use this information to develop an operation plan for the barrage gates that best addresses the needs of the individual stakeholders in the region.

Chapter 2: Literature Review

Lake Wairarapa is a shallow lake in New Zealand situated on the southern end of the northern island. The Wairarapa Moana Region, shown in Figure 5, regularly flooded until the Wairarapa Catchment Board, consisting of local residents, developed a flood prevention scheme called the Lower Wairarapa Valley Development Scheme (LWVDS) in 1960. This enabled farmers to harvest more land, however, the flood prevention measures caused Lake Wairarapa to become one of the ten most polluted lakes in New Zealand.



Figure 5 - The Wairarapa Moana region includes Lake Wairarapa and Lake Onoke (Google, 2015)

The Lower Wairarapa Development Scheme established a set of barrage gates that control water levels in Lake Wairarapa. A resource consent gives the Greater Wellington Regional Council permission to manage the barrage gates. This resource consent is up for renewal in 2019. The goal of the Greater Wellington Regional Council is to assess the conflicting expectations and needs of each stakeholder in the region concerning the lake's current management. This study concerns the following stakeholders:

- The Greater Wellington Regional Council, our sponsor, manages the water level of the lake via six barrage gates.
- Rangitāne o Wairarapa is one of the two local tribes, also known as iwi, who live in the area surrounding Lake Wairarapa.
- The Department of Conservation is responsible for conserving New Zealand's natural and historic heritage.
- The Landowners around the Ruamahanga Cutoff who significantly contribute to the economy of the region and maintenance cost of the Lower Wairarapa Development Scheme. They are mostly farmers and this paper refers to landowners and farmers interchangeably.
- The South Wairarapa District Council aims to serve and welcome residents and visitors alike in the district and manages parks and reserves.

2.1 Land Conflicts in Wairarapa Moana

2.1.1 History of the Treaty of Waitangi

The British Crown and over five hundred Māori chiefs signed the Treaty of Waitangi in 1840 to establish the Crown's sovereign rule over New Zealand. The Māori people supported the treaty because of the promised regulations on settlement and land sales. They were in favor of the potential economic benefits and the reduction in inter-tribal warfare. Māori also assumed that the Crown and the Māori chiefs would share authority (Orange, 2012). However, there were many complications associated with its signing, enforcement, and maintenance that are still without resolution today. Discrepancies between the English and Māori versions of the treaty

prevented a mutual understanding between both parties. This led the chiefs to believe that they were maintaining more of their power than in actuality. The Crown felt that the Māori leadership threatened Crown authority. Just four years after the signing of the Treaty of Waitangi, Crown officials began limiting the rights of the chiefs, which breached the signed agreement (Orange, 2012).

The ambiguity surrounding the treaty resulted in warfare between the government and the Māori tribes. The Crown's sovereign rule forced all chiefs to comply with the rules of the treaty, including many chiefs who did not agree to sign. Initially, a stronger Māori authority lingered because the Crown did not enforce sovereign rule in many remote areas of New Zealand. Over time, the Crown gained influence and excluded Māori from national government decisions. Tension between the Māori and Crown inevitably led to the British invading Waikato in the 1860s. There is argument over whether this war functioned as a means to suppress the Māori rebellion or for the Crown to assert supremacy. Regardless, the Māori felt the Crown did not respect their rights and freedoms under the Treaty of Waitangi (Orange, 2012).

Acknowledgement of Waitangi Day instilled a greater understanding between the Māori and the Crown by increasing treaty awareness among the public. The Crown began reconciliation with the creation of the Treaty of Waitangi Act 1975. This established the Waitangi Tribunal, a commission that evaluates Māori claims about breaches in the treaty (Orange, 2012). To this day, the Waitangi Tribunal works diligently to correct many land disputes between the Crown and the Māori tribes by assessing settlement claims among many tribes. The treaty failed to protect the Māori people from falling victim to unruly land sales, which the Crown often encouraged. Native tribes all across New Zealand felt the grievances experienced by the Māori tribes in the Wairarapa region (Orange, 2012).

2.1.2 Breaches in the Treaty

The economic interests of the Crown brought the settlers to the Wairarapa Moana region, which led to breaches in the Treaty of Waitangi. The British desired to recreate a settlement similar to their homeland. The Māori wanted the treaty to prevent the settlers from overwhelming their land, however British settlers began farming only four years after the signing of the Treaty of Waitangi. The Crown wanted to purchase Wairarapa Moana land from the Māori tribes when the settlers pressured for the installation of a ferry service. The Crown promised

benefits to get the Māori to sell the land at a cheap price. These included using the Crown's influence to create land reserves and reap the benefits of the local settlers by participating in the market economy. The Māori sold millions of acres to the government with the expectation that the settlers would not develop land below the *tehakupu* (high water mark) (Grant, 2012). Ultimately, the settlers acquired more land from the Māori than the Māori were willing to sell.

The Crown never properly surveyed and documented the land, which led to issues determining how large the lake was and how much land the settlers could claim (Grant, 2012). In 1855, an earthquake dramatically altered the landscape, which allowed British settlers to acquire more land without further sale. "The earthquake lifted parts of the shallow lake out of the water, enabling settlers to graze more pasture, and allowing the government to sell land it had not purchased, much to the chagrin of local Iwi" (Grant, 2012: Pg 71). The dotted line in Figure 6 shows the land that the 1855 earthquake uplifted, and Figure 7 shows how the sand bar lengthened and closed the spit at Lake Onoke due to the earthquake of 1855 (Grapes, R., & Downes, G., 1997; p.g.s 56-57).

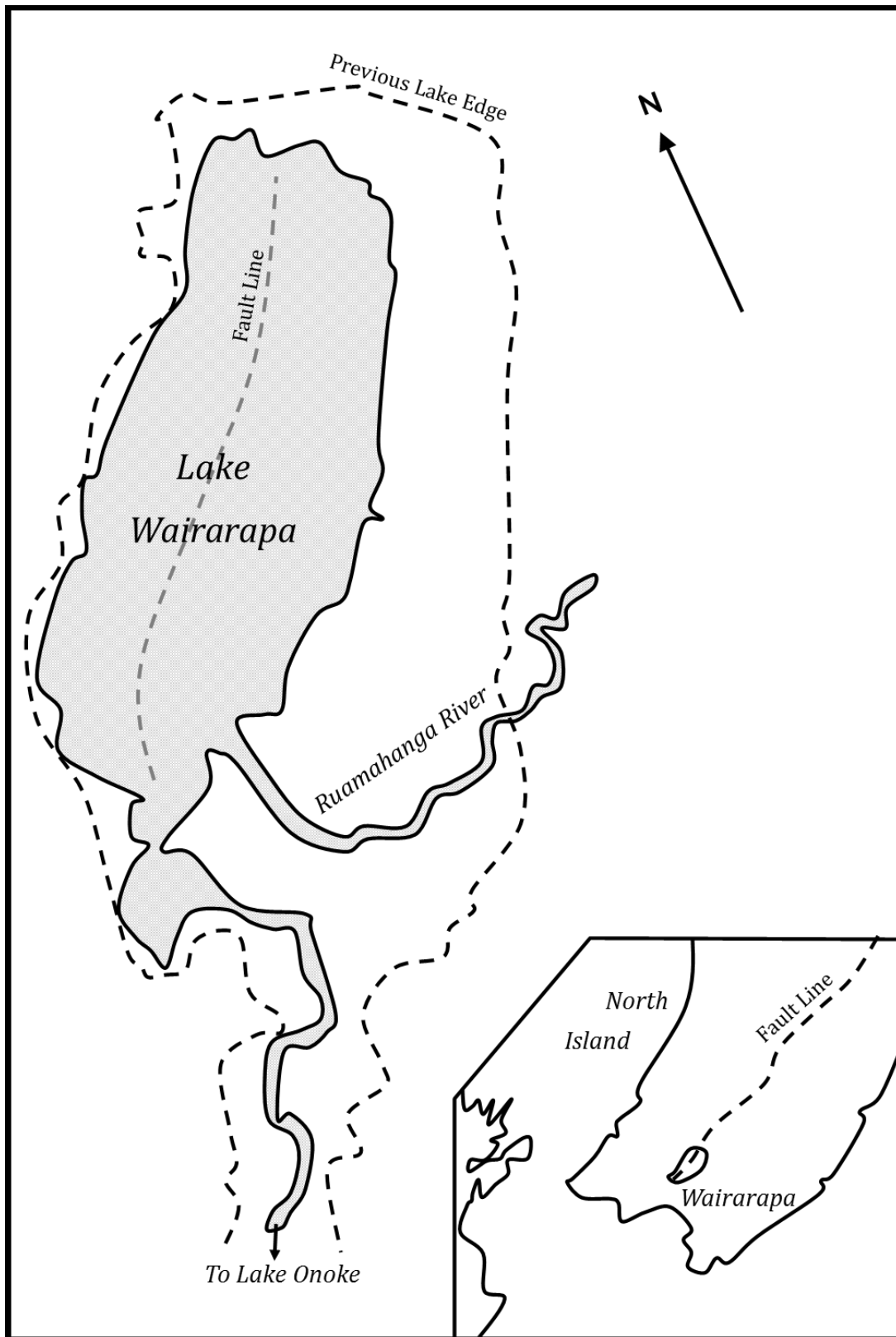


Figure 6 - shows a dotted line that represents the area uplifted by the 1855 earthquake. The uplifted land fell to Crown ownership, as they failed to properly survey the land before the earthquake occurred (Grapes, R., & Downes, G., 1997; pp 56-57).

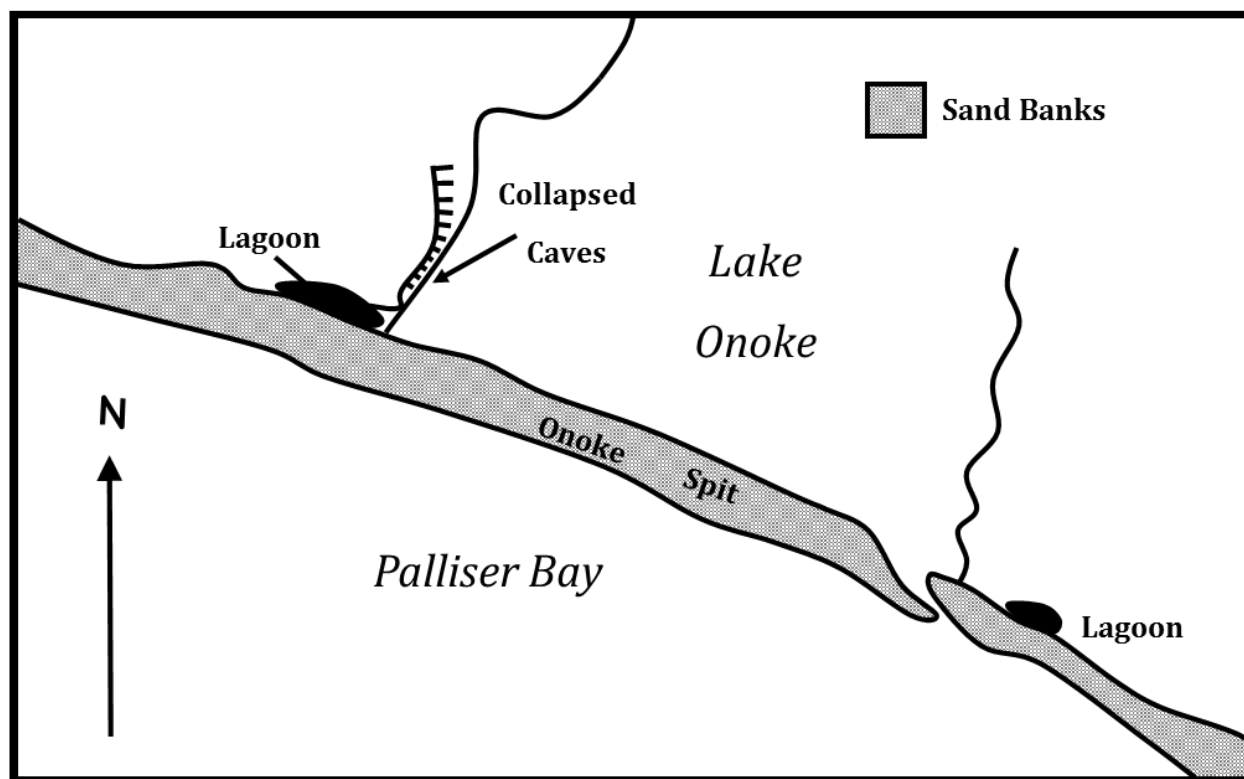
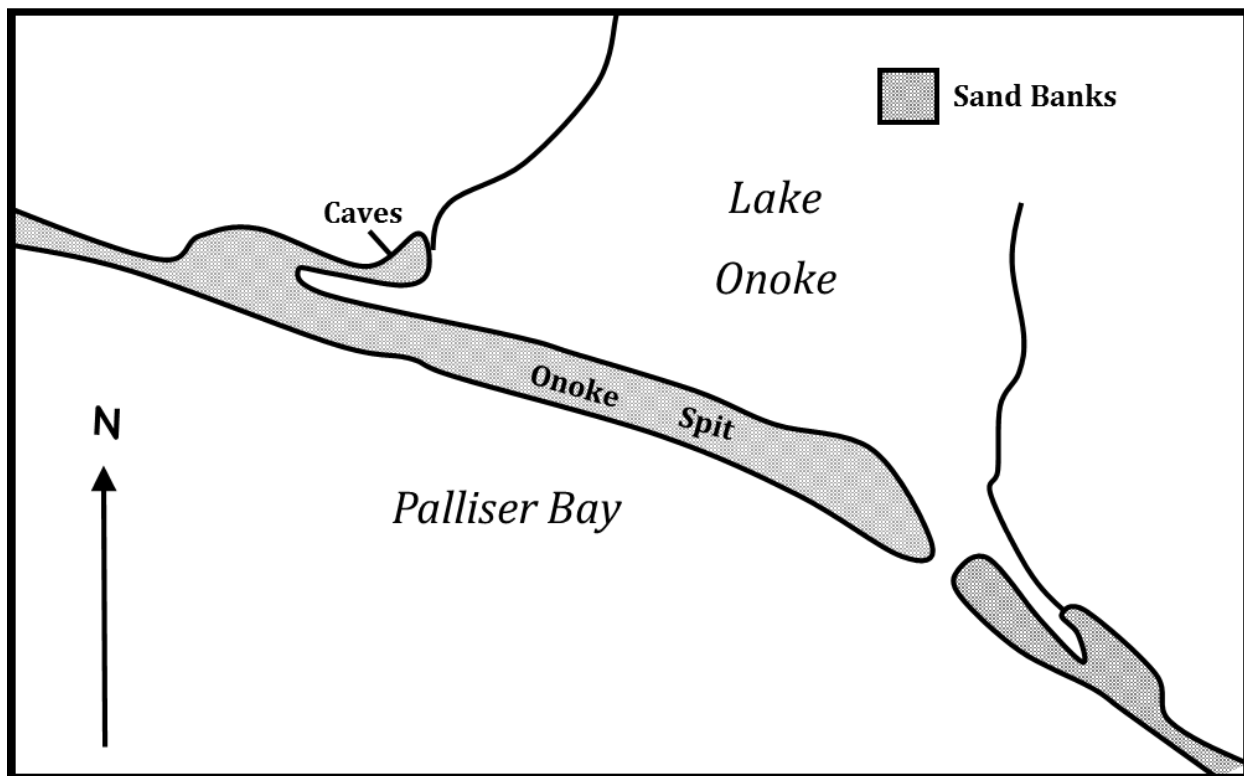


Figure 7 - shows how the earthquake of 1855 altered the split opening by lengthening the sandbar (Grapes, R., & Downes, G., 1997; p.g.s 56-57).

To this day, the outlet at Lake Onoke is a point of tension between both parties. The settlers preferred to keep the lake channel open to reduce flooding and drain the lake, providing more land for grazing. However, this competed with the interest of the Māori, who needed the high water levels achieved by a closed lake outlet to maintain their *tuna* or eel fisheries. The Māori were willing to negotiate the allowable times for opening the outlet and to enforce a compromise as long as the wishes of the community did not conflict with the times of eel and fish harvesting. The Wairarapa Moana Māori Committee, a group that represented Māori land interest in discussions, agreed to limit the yearly harvesting yield and open the outlet ten months out of the year. The Crown rejected this compromise because they wanted to fully purchase the land (Grant, 2012).

The Crown and the settlers maintained constant pressure in their efforts to seize control of the lakes despite the Māori's legal control of the lakes, the margins, and the land surrounding the Lake Onoke outlet. The government tried unsuccessfully to gain control of Māori property by falsely declaring that the Māori did not have the legal rights to the land. The government also tried to claim public ownership using the Public Works Act to take control of the outlet. While none of these individual attempts were successful at procuring the land from the Māori, the settlers did not relent. The Ruamahanga River Board, comprised mainly of settlers, wanted the government to declare this land a public drain. The settlers threatened the Māori with fines and arrest when they peacefully protested the settlers' attempt to open the lake outlet without permission (Grant, 2012). The crown pressured generations of Māori to give up their land through breaches in the treaty and unjust actions until the Māori had no other choice but to gift the land (Grant, 2012).

2.1.3 Gifting the Land

The Māori value land as a treasure or *toanga*, which ancestors traditionally pass down from generation to generation. When the Crown left the Māori with no other option than to sell, the Māori gifted their land. The Māori believe that the land is so important that they could not possibly sell it. Instead, they transferred the land as a “chiefly gift” or *tuku rangatire* (Grant, 2012). The Wairarapa Moana Māori Committee signed the deed to turn over the land, and gifted the land as a gesture of peace and goodwill (Grant, 2012). The Māori thought that they only gave

up the legal title of their lands and that they still laid claim to the waters and fisheries within the lake.

Through the chiefly gift, the Māori expected the Crown to create reserves out of the land surrounding Lake Wairarapa. Instead, the Crown made this land accessible through the Public Bodies Empowering Act of 1907, which allowed adjacent landowners to purchase the land and further encroach on the boundaries of the lake (Grant, 2012). In its place the Crown allocated a reserve to the north in Pouakani, which was a much larger area of land totaling 30,486 acres. Figure 8 represents the almost 500 km journey the Māori would have to take to reach the reserve land the Crown promised them (Wairarapa Moana Inc., n.d.). This upset the Māori since the land was not only distant from their current location, but also because the Crown gave it as a reserve because it was unusable by the Crown and lacked any accessibility (Grant, 2012). The Crown's lack of consideration inevitably left the Māori legally landless, without a national identity and struggling to preserve their way of life.

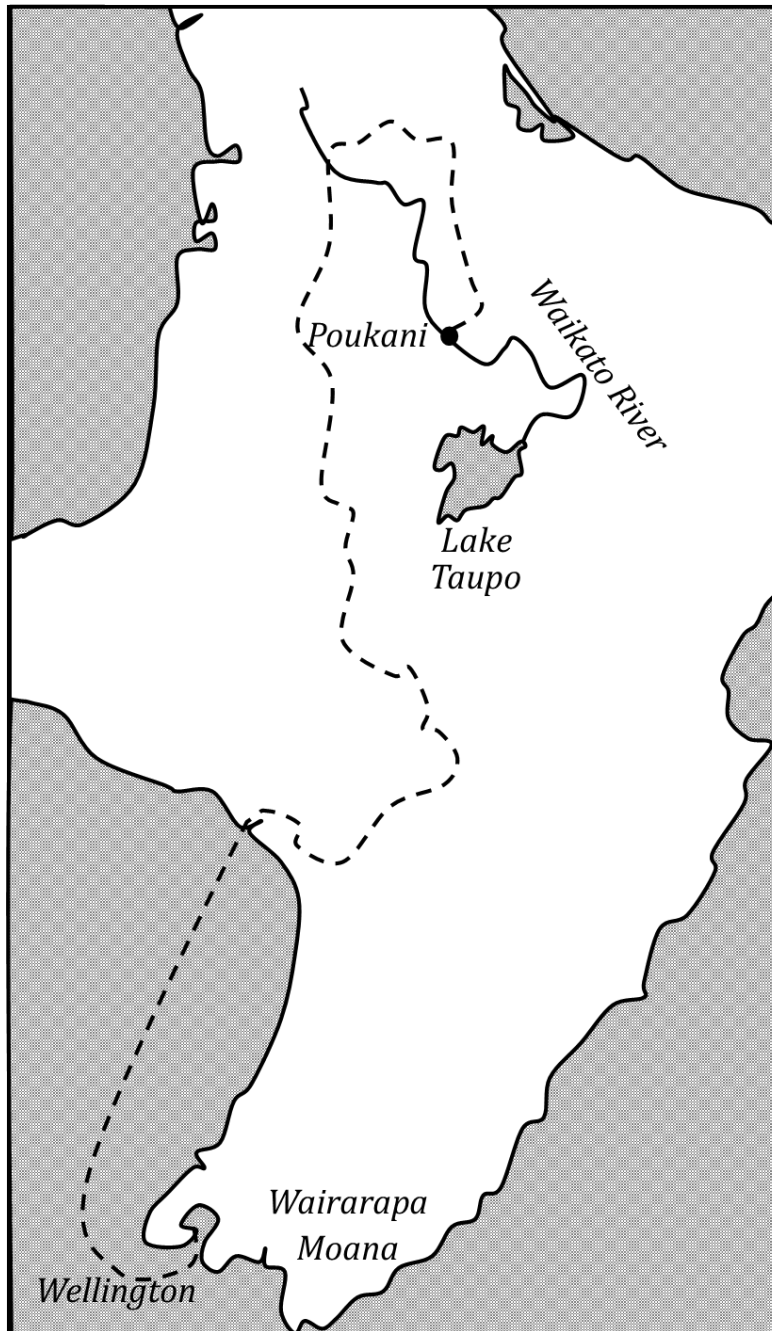


Figure 8 - This picture shows the route the Māori would have had to travel to reach the reserve lands. The Māori had to travel by ferry, rail, road, and overground to reach the reserve, and the government did not build the first road until 1945. The right side

2.1.4 Māori Significance of Water

Most cultures depend upon water for their livelihood and form settlements based on the location of water. Having access to clean water is important to the Māori tribes so that they can

perform the cultural rituals, such as *Wairua* (spiritual), *Tinana* (physical body), *Hinengaro* (mental wellbeing), and *Whanau* (transportation and recreation), all of which require the use of clean accessible water (Royal, 2011). The Wairarapa Moana region currently has a great quantity of water, but poor water quality due to contaminants (Royal, 2011: pg 99). In certain areas there are signs that now warn against the usage of the water for food and recreational purposes due to leaking sewage from the surrounding region (Royal, 2011: pg 20). The Crown's management of many of the natural bodies results in unnatural water flow. This continues to be a controversial issue among the people of Wairarapa Moana.

2.2 Wairarapa Moana

Wairarapa Moana (Figure 9) consists of three main bodies of water; the Ruamahanga River, Lake Onoke and Lake Wairarapa. Lake Wairarapa covers seventy-eight square kilometers making it the third largest lake on the north island in New Zealand, according to the Wairarapa Moana Wetlands Project website. The lake's main outflow is into the Ruamahanga River which flows into Lake Onoke. Lake Onoke is an Intermittently Closed and Open Lagoon (ICOLL) which opens into Palliser Bay. Tidal movements in the bay largely influence the water flow from Lake Wairarapa to Palliser Bay resulting in flow in either direction in the Ruamahanga River (Grant, 2012). This is a dynamic water system in which there can be a mix of saline water from the ocean and fresh water from the mountains several miles from the mouth of the system.



Figure 9 - Wairarapa Moana (Google 2015)

Multiple climatic factors contribute to interesting and sometimes unmanageable water levels in this region. The Wairarapa region has generally very warm summers and cool winters. This region experiences rainfall, shown in Figure 10, ranging from 800mm to 10,000mm per year with occasional heavy rainfall. Two dominant weather patterns from the Tasman Sea drive the heavy rainfall. First, the moist north-westerly winds flow upward and over the Tararua Ranges causing high intensity rainfall in the high elevation portions of the western region. Second, south-easterly winds induced by the depression to the north east contribute to heavy rain in the eastern hills (Grant, 2012).

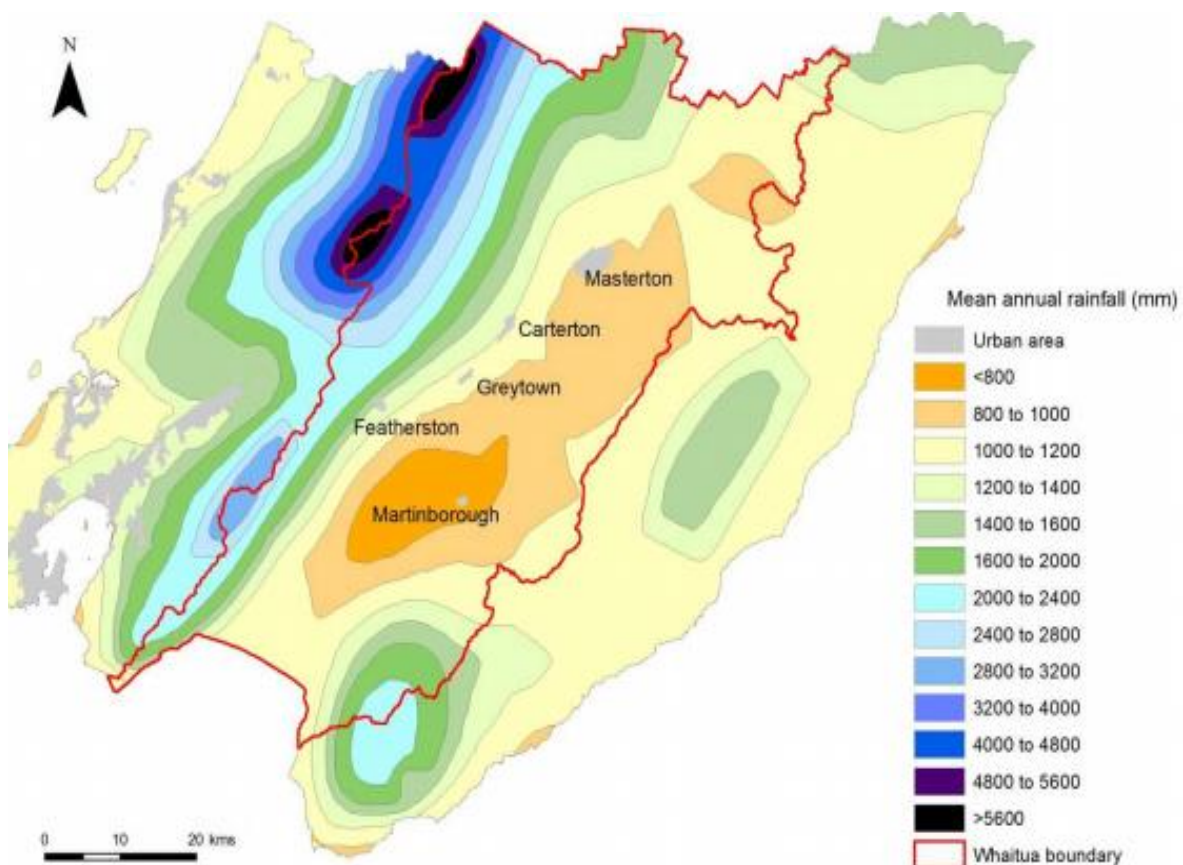


Figure 10 - Mean annual rainfall in the Wellington region showing an outline of the Ruamāhanga Catchment (Greater Wellington Regional Council, n.d.)

Although the climatic factors impact the water levels, the lands surrounding Lake Wairarapa flood mostly due to the unique geographic features of the water system. In the past, floods would occur on a seasonal basis. This flooding turned much of the land adjacent to Lake Wairarapa into swamps which made settling and farming the land around the lake impractical.

However, as European settlers developed the region, they took control of the flooding. Eventually, citizens around the lake established the Wairarapa Catchment Board, a local governing body tasked with creating a flood prevention scheme. The first flood control measure consisted of manually digging out the spit of Lake Onoke in order to let water from the system drain to the sea (Grant, 2012).

2.2.1 Lake Onoke - The Path to the Sea

Intermittently Closed and Open Lagoons (ICOLL), such as Lake Onoke, involve a bar of sediments or “spit” that separates a lake from the ocean (Haines, 2008). When the barrier spans the entire boundary between the lake and the sea, it closes or “blocks” the water system. This prevents water from moving between Lake Onoke and Palliser Bay. However, if the water levels in the lake are sufficiently high, the water can naturally overflow the barrier, break down the spit and create an opening that will allow flow (see Figure 11). The left side of Figure 11 shows Lake Onoke with the spit opened and the right shows the blocked spit.



Figure 11 - The picture on the left shows the Lake Onoke spit with a natural opening allowing water to flow. The picture on the right shows when the spit blocks. The yellow arrow indicates the Ruamahanga River. (Google, 2015)

At the southern end of Lake Onoke, tidal currents from Palliser Bay have a strong influence on flow and at the northern end, the Ruamahanga River is the prominent inflow. The strength of each determines the overall direction of flow. When sediment blocks the spit, the system cannot initially drain into the ocean and water levels in the Ruamahanga and Lake Onoke

will rise. In pre-European times this was usually fine because the higher water levels in Lake Onoke would then cause the spit to naturally break down and open the outlet again. However, because of the threat of flooding on the Ruamahanga River floodplain from heavy rainfall events today the Onoke Spit is generally mechanically opened, via diggers shown in Figure 12. However, due to weather conditions, this is sometimes impossible and flooding dangers persist. This poses a problem for those inhabiting Wairarapa Moana (Haines, 2008).



Figure 12 - Digger opening Lake Onoke spit (Greater Wellington Regional Council)

2.2.2 Flood Prevention in the Wairarapa Region

In the 1960s the Wairarapa Catchment Board created a flood prevention scheme that protects 40,000 acres and partially protects another 13,000 acres (Grant, 2012). The board

invested 4.06 million NZD into the flood prevention scheme that took ten years to build. However, they broke even on their investment after only five years.

The flood prevention scheme, known as the Lower Wairarapa Valley Development Scheme, includes man-made stopbanks, low overflow banks, the Ruamahanga Cutoff, and a set of barrage gates. The stopbanks are high sections of land on the either side of the water to prevent overflow. Low overflow banks allow excess water in the river to divert into the lake. The Ruamahanga Cutoff is a manmade waterway which allows the river to bypass Lake Wairarapa. Preventing the Ruamahanga from flowing into the lake makes the land surrounding Lake Wairarapa less susceptible to flooding. The most significant part of the scheme is a set of barrage gates located at the conflux of the Lake Wairarapa outflow and the Ruamahanga River. The barrage gates regulate the only stream that connects the Ruamahanga River and Lake Wairarapa as shown by the green circle in Figure 13.



Figure 13 - Yellow lines show the previous, natural path of the Ruamahanga River. The red line shows the Ruamahanga Diversion and the current path of the river. The green circle show the location of the barrage gates. (Google, 2015)

The barrage gates play a crucial role in the flood prevention scheme. The GWRC office in Masterton remotely controls the system, which consists of six radial arm gates. They operate the gates in order to achieve target water levels between 9.95 and 10.15 meters in Lake Wairarapa (Greenberg, 2014). The GWRC uses the gates for one of three roles: to let water into Lake Wairarapa, to let water out of Lake Wairarapa or to cut Lake Wairarapa off from the Ruamahanga entirely. Different configurations of the dam are necessary for different water levels and flow conditions. The barrage gates, shown in Figure 14 and Figure 15, are important for regulating water levels, especially during periods of heavy rainfall. Generally, the scheme can handle floods with a “one in twenty years” type severity. A one in twenty years event is the most severe flood the land would typically experience over a twenty-year period. Recently, the flood prevention system exceeded expectations by withstanding a one in fifty years flood (Greater Wellington Regional Council, 2014).



Figure 14 - The Blundell Barrage Gates: side view



Figure 15 - The Blundell Barrage Gates: top view

The GWRC normally operates the gates in order to prevent flow into the lake and to achieve desired water levels. However, if Lake Onoke blocks and the water levels in the river are critically high, they release water into Lake Wairarapa. The Greater Wellington Regional Council accomplishes this by raising the gates in order to relieve flooding from the Ruamahanga until they are able to reopen the spit. Without the presence of any extreme flood conditions or blocking conditions in Lake Onoke, the GWRC typically keeps the gates closed except in winter when a low target level is desired.

Due to the complexity of the system, water levels are difficult to regulate without disrupting the natural state of the water. The Ruamahanga Cutoff and the barrage gates cause much less water to flow through the body of Lake Wairarapa. This alters the lake and causes it to be more stagnant which results in murky waters, bad smells, and pollution. Pollution in the lake

causes imbalances in the entire Wairarapa Moana ecosystem. Some stakeholders oppose the Lower Wairarapa Valley Development Scheme because of the problems created by the flood prevention measures (Greater Wellington Regional Council, 2014).

2.3 Ecological Effects of the Lower Wairarapa Valley Development Scheme

Wairarapa Moana is the largest wetland complex in the lower North Island and is home to diverse plant and animal life. Historically, the overall ecology was more biodiverse and abundant, however major threats led to destruction and fragmentation of the indigenous ecosystems due to land-use change and commercial land management. During European settlement, the need for timber and land along with the Māori's desire to hunt moa, a flightless bird native to New Zealand, resulted in settlers lighting widespread fires which destroyed much of the native forest. Additionally, the Lower Wairarapa Valley Development Scheme drastically modified Wairarapa Moana through flood control. This improved the economy and increased the amount of land suitable for agricultural use. Unfortunately, this negatively affected the ecology of the lakes and their surroundings. However, organizations such as the Greater Wellington Regional Council and the Department of Conservation focus their attention on improving the current ecological conditions of the region (Bunny, et al., 2014).

2.3.1 Soils and Vegetation of the Wairarapa Moana

Today, in Wairarapa Moana there are several different areas each with their own distinct soil type and vegetation. This includes the regions around Lake Wairarapa such as the eastern and western shores, the sedgeland and the ephemeral wetlands.

Along the eastern shores of Lake Wairarapa, north westerly winds from one direction raise water levels while winds in another direction carry sediment that traps water which forms lagoons and turf fields shown in Figure 16. This area is home to about fifty-five plant species. Low lake water levels seasonally expose common water milfoil and pondweed. The species in this area survive through alternately inundated and exposed conditions and support an ecosystem that is internationally significant particularly for wading birds.



Figure 16 - Crassula, Wairio Turf Field (Silbery, 2011)

On the western side of Lake Wairarapa, a lowland forest from the Wairarapa Lakeshore Scenic Reserve lies within close proximity to the water's edge. Despite the location, the area only floods in extreme cases. Manuka, a woody plant inhabits the sedgeland. Sedgeland is the area in between high and low water marks covered by grass-like plants that grow in wet grounds. Additionally, invasive willows are starting to outgrow competing rushes and sedge resulting in a decreasing cabbage tree population as seen in Figure 17 (Grant, 2012)



Figure 17 - JK Donald reserve (Silbery, 2015)

Flaxland, cabbage trees, and shrubland dominate the sedgeland. Shrublands are areas dominated by small trees with many different smaller branches that are similar to bushes. The sedgeland declines the most in natural habitats due to increased stock grazing and the invasion of exotic species. Near the sedgelands are the unique ephemeral wetlands which are home to a more diverse and flourishing vegetation. When flooded, the region becomes a lagoon, but in drier times flaxes and shrubs dominate. The ever-changing water levels of this area force plant life to persist through the high water times and colonize during drier times. Overall, the majority of the vegetation flourishes in the region's challenging conditions making this particular plant life unique and rare in New Zealand and internationally (Grant, 2012).

2.3.2 Degrading Water Quality of Lake Wairarapa

Lake Wairarapa is one of the ten most polluted lakes in New Zealand due to the degrading water quality. The Greater Wellington Regional Council routinely measures and documents the lake water. These measurements show elevated levels of nutrients, algal biomass

and poor water clarity which contribute to the degraded water quality. The diversion of the Ruamahanga River away from Lake Wairarapa causes buildup of sediments and nutrients on the Lake Wairarapa bed. The rapid expansion and intensification of dairy farming within Wairarapa Moana requires increasing amounts of water for irrigation. In order to produce one gallon of milk, a farmer uses up to 900 liters of water and produces significant amounts of nutrient pollution with fertilizers and effluent runoff. This causes overgrowth of weeds and algae in the waters (Grant, 2012). High algal biomass poses health risks to lake users and wildlife. The shallow nature of the lake causes low water clarity and high phosphorus levels. At 2.5 meters at its deepest point, shallow waters and decreased wave movements inhibit sediments from settling which negatively affects the lake's water quality.

A water quality characteristic known as the Trophic Level Index (TLI) classifies Lake Wairarapa as “super trophic” meaning there are very high levels of nutrient enrichment. Eutrophication or more precisely hypertrophication, is the ecosystem's response to the addition of artificial or natural nutrients, mainly phosphates, through detergents, fertilizers, or sewage, to an aquatic system. One example is the "bloom" or great increase of phytoplankton in a water body as a response to increased levels of nutrients. Negative environmental effects include hypoxia, the depletion of oxygen in the water, which may cause death to aquatic animals. Chlorophyll *a* levels, Secchi depth (water clarity), total phosphorus and total nitrogen determine the TLI. Table 2 below demonstrates the differences in TLI between native land and farmed land.

Table 2 - National median values for selected water quality variables categorized by dominant lake catchment land cover, taken from Verburg et al. (2010). The number of lakes in each land cover category is shown in brackets.

Variable	Dominant land cover ¹	
	Native (49)	Pasture (50)
Conductivity (µS/cm)	228	192
pH	7.5	7.7
Secchi depth (m)	6.4	2
Turbidity (NTU)	0.8	3.2
Total nitrogen (mg/L)	0.149	0.7734
Ammoniacal nitrogen (mg/L)	0.006	0.013
Total phosphorus (mg/L)	0.007	0.0368
Dissolved reactive phosphorus (mg/L)	0.002	0.0025
Chlorophyll <i>a</i> (mg/m ³)	1.6	8.8
TLI	3.0 (mesotrophic)	4.9 (eutrophic)

¹Dominant lake catchment land cover was determined by the largest percentage of land cover within a catchment (Verburg et al. 2010), although the authors note that land cover/uses that are not dominant can also have a significant impact on lakes water quality.

All of the above elements of water quality fluctuate, specifically with the seasons. Total nitrogen concentrations are highest in the winter due to wetter soils and a higher groundwater table in Wairarapa Moana. This promotes the transport of nitrogen into groundwater that eventually flows into Lake Wairarapa. Concentrations of total phosphorus are highest in spring and early summer when farming production is at its peak. High winds in spring and early summer suspend sediment in the water. Wind increases disturbance within the lake, however the Greater Wellington Regional Council test samples under calm conditions. Therefore, the tested samples indicate better quality. The presence of salty water in the lake water improves water clarity and reduces levels of phosphorus and chlorophyll through a diluting effect. Saline water previously back flowed from Lake Onoke into Lake Wairarapa regularly. However, the implementation of the barrage gates dramatically reduced the amount of saline backflow (Bunny, et al, 2014).

2.3.3 Birds of Lake Wairarapa

Wairarapa Moana contains one of the most diverse populations of birds in New Zealand. Over one hundred species enjoy Lake Wairarapa's ideal conditions. The wetlands of Lake Wairarapa support over 10,000 waterfowl (Beadel, et al, 2000). Black swan, shoveler, dabchick, scaup, and canadian geese populate the open water as shown in Figure 18 (DOC & GWRC, 2015).



Figure 18 - Black swans (Silbery, 2011)

Waders and oystercatchers search for food along the lakeshore. The eastern side attracts migratory wading birds that come from all over for seasonal use. Scaup and dabchick find their home at the northern end of the lake while Australasian Bittern nest in the raupo plant. Records show a total of seventy-five native and twenty-six introduced bird species in the area, including nineteen nationally threatened birds and forty-six regionally threatened birds. Currently, the target lake levels provide the birds with prosperous living conditions. However, in order to protect these species, the GWRC and the DoC, along with other organizations must address the pollution of the lake (Grant, 2012).

2.3.4 Aquatic Species of Lake Wairarapa

The dynamic water system of Wairarapa Moana contributes to a matchless population of aquatic species. Fifty percent of New Zealand's native freshwater fish inhabit the region including grey mullet, common smelt, black flounder, and torrent fish. The majority of these fish are diadromous species, such as eel (see Figure 19) that migrate between freshwater and seawater to complete their life cycle. Lake Onoke blocks routinely from February to May. This

season coincides with eel migration out to sea. Blocked water keeps the eels in the lake which allows local Māori fishermen to harvest them. Shortfin eel, common bully and brown mudfish are popular in the eastern wetlands, while longfin eel prefer more restricted areas such as privately owned lagoons (DoC & GWRC, 2015).



Figure 19 - New Zealand Longfin Eel (Norling, 2013)

Whitebait refers to the juveniles of five different diadromous fish species: inanga, banded kokopu, giant kokopu, shortjaw kokopu, and koaro. Inanga is the most commonly caught whitebait and also the smallest at only about 100 mm. They have silver bellies and a forked tail that distinguish them from the other species (DOC). Swimming upstream is a challenge and therefore they congregate in schools or shoals in downstream coastal areas. Banded kokopu are typically long, stout, dark brown fish with golden stripes on their sides that can grow to 200mm long. They inhabit small streams where they can jump out of the water to grab spiders or insects off overhanging brush and branches or feed off vegetation that falls off into the water off overhanging brush and branches (Grant, 2012). Likewise, giant kokopu are dark brown with gold

markings, but can also be black with gold markings. They are the largest of the whitebait species growing to be up to a half meter long. They prefer secretive habitats such as deep shaded pools in wetlands, but also inhabit lakes and forest streams close to the sea due to their lack of climbing ability (DOC). The shortjaw kokopu are golden pink and 150-200mm long. They live only in high country streams in native forests and are rarely seen (Grant, 2012). The design of their jaw allows them to scrape underwater insects from rocks (DOC, 2010). Lastly, the koaro has sparkling gold markings and is the most beautiful of the whitebait shown in Figure 20. They can grow up to 290mm and usually live near waterfalls in high country streams due to their amazing ability to “climb” or swim upstream. They suck onto wet, vertical surfaces and grip using their large fins and commonly jump out of whitebait buckets (Grant, 2012). They can live for more than fifteen years and travel up to 400km from sea, and vertically up to 1300m (DOC, 2010).



Figure 20 - Koaro (Department of Conservation, n.d.)

Three of these five species, the banded kokopu, the giant kokopu, and the shortjaw kokopu only exist in New Zealand. Collectively, whitebait are typically nocturnal and stay hidden in bushy streams that provide shelter and food. All whitebait breed once a year usually during autumn when they lay their eggs out of water under plants to keep them moist. These eggs

stay out of water for several weeks until the tides or floods raise water levels causing them to hatch. Whitebait spend four to six months in salt water and then migrate back to freshwater where they are most often caught. DOC highly regulates catching whitebait due to the threatened number of whitebait species. The whitebait season in Wairarapa Moana spans from August 15th to November 30th each year. DOC permits the capturing during the hours of 5am to 8pm during regular time and 6am to 9pm during New Zealand Daylight Saving Time. There are restrictions on the sizes of fishing equipment and fishing locations. Infringing on these regulations may result in a fine up to \$5000 NZD (DOC, 2010).

2.3.5 Ecological Threats

Invasive plants, pest animals, and increased land use all pose threats to the ecology of Wairarapa Moana. The loss of areas known as riparian zones around the lake and river edges, in order to clear more land for farming, causes catastrophic effects to the ecology of the region. Riparian zones mostly consist of trees and other green vegetation, which increase the water quality through capturing, storing, and treating the water through chemical and biological reactions (Edwards, 2000). The destruction of these regions involved the removal of natural filters and resulted in loss of plant and animal life. This factor along with drainage schemes destroyed ninety percent of the wetlands since 1840 and degraded water quality (Grant, 2012).

Farming in the region severely affects the vegetation. During European settlement, widespread fires destroyed much of the forests. Grass plains used for farming replaced the once wooded land. Now, cattle trample and destroy broadleaf shrubs and young trees. Additionally, sheep herding significantly impacts the vegetation through reduction of habitat and grazing.

Runoff from cattle and sheep, among other stock, pollute water and harm aquatic species. The failure of the Wildlife Act to protect against overfishing, in addition to manmade barriers, continues to degrade fish populations (Grant, 2012). The lack of clean, healthy water has negative impacts on many fish species. Native fish also compete for habitat with trout and other pest and sports fish that prey on native species. Introduced plants overgrew the habitats of many species. Barriers prevent the migration of diadromous species to the small amount of clean water that remains. There was an attempt to provide a passage for fish and other species through the barriers after the review of the resource consent in 1994 and 1998, however, these passages were not successful because they were too deep in the water. (DOC & GWRC, 2015).

Other threats on Wairarapa Moana include invasive species, pest animals, and vehicles such as quad bikes and 4WDs that damage native vegetation and disturb native wildlife. Hornwort, an invasive species, is shown in Figure 21. Several recorded nationally threatened plant species are becoming extinct in the region. Traditionally, rich waters and wealth of wildlife dominated Wairarapa Moana. However, today human activity profoundly changes the ecological landscape in the area (Beadal, et al, 2000). The GWRC and the DOC, among other organizations, recognize these threats and are working towards a feasible solution (DOC & GWRC, 2015).



Figure 21 - Hornwort at Oporua Spillway (Silbery, 2011)

2.3.6 Ramsar Status

The Ramsar Convention is a treaty that deals with the preservation and sustainability of wetlands internationally. The Convention's mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world." The convention designates certain bodies of water as *Ramsar Sites*. These sites exemplify unique and/or environmentally

important wildlife or have other rare geographic features. Considering the unique native wildlife and vegetation that inhabits Lake Wairarapa, the Wairarapa Moana Wetlands Project has begun the application process for recognition as a Ramsar Site. Currently, Lake Wairarapa meets seven of the Ramsar Convention's nine site criteria. (Ramsar, 2015).

However, there is much debate over the Ramsar status of the lake. Farmers believe that a Ramsar status of Lake Wairarapa would allow for greater penalties against farmers when they breach resource consents. However, many other organizations support the lake becoming a Ramsar Site due recognition of much of the natural wildlife and wetlands. Additionally, a Ramsar status for Lake Wairarapa, could boost tourism and assist grant applications when local councils apply for funding (Ramsar, 2015).

2.4 Economic Outlook of Wairarapa

2.4.1 BERL Economics Report

In November 2008, BERL Economics released the *Economic Profile and Projections for the Wairarapa Region*. The report highlighted the current outlook of the Wairarapa economy and explored two different future scenarios: a growth rate on par with the rest of New Zealand and a growth rate that is less than that of New Zealand. The key driver industries in the region are sheep and beef farming, horticulture and viticulture, dairy farming, food processing, wood processing and health and community services (Nana, 2008).

As of 2007, the largest contribution to employment in the Wairarapa region is the agriculture industry at 15.3% followed by business services at 7.3% and accommodation, cafes, and restaurants at 6.4%. Agricultural jobs are the primary sector of employment in the region and also have a higher importance than agricultural jobs elsewhere in the country. Data based on the location quotients of employment for the various sectors supports the importance of farming. Location quotients indicate the importance of regional employment. An "LQ" of one suggests employment similar to that of the entire country and higher LQ values suggest more intensive employment comparatively in that particular sector. Topping the list in the Wairarapa region are hunting and trapping at 2.704, agriculture at 2.560 and commercial fishing at 2.489. The Wairarapa region is the center of the New Zealand dairy industry. Four percent of the dairy

industry resides on the 60,757 hectares of land dedicated to farming in Wairarapa Moana. The milk production has a \$474 million dollar (NZ) value in the regional economy (DairyNZ, 2013). The region relies heavily on primary industry, which is the direct marketing of natural resources, rather than manufacturing (Nana, 2008).

The BERL Economics report concludes with specific outlooks for the region which states that the more prosperous scenario results in a decrease in regional tourism. A possible cause of this could be that an increase in farming and manufacturing will make the area less desirable for people to visit. While not necessarily attractive, the current setup of the flood prevention gates and river cutoffs is vital to the agriculture and economic growth of the region. However, this does not consider the natural consequences of altering flow patterns of the water system. The report presented both advantages and disadvantages for both scenarios, which shows that many factors play into the future economic well-being of the region (Nana, 2008).

2.4.2 Sapere Report

The present day value of the Lower Wairarapa Valley Development Scheme is roughly 140 million NZD. The LWVDS has a substantial impact on the local economy. Much of the farming success and primary industry around the lake relies on the successful flood prevention measures provided by the scheme. The barrage gates play a significant role. The Sapere Report, developed for the GWRC, assumes four key benefits to the region, value of flood protection to the Wairarapa Community, value of land protected from floods, value of land protected from erosion (due to stopbanks and river containment measures) and an increased value of land from the ability to drain it (due to lower water levels) (Wyatt, 2015).

In order to analyze the economic value of the scheme, the report considers the flood protection benefit, the current land use, the land use without the flood prevention scheme and the limitations of the study. The differences in land use between the two scenarios, in addition to flood protection, constitute economic benefit for the South Wairarapa Region. In order to determine the land use of the scenario without flood protection, Sapere analyzed the flood protection benefit, the land erosion protection benefit and the drainage land change benefit. Essentially, by determining the effects of the flood prevention scheme on the land and on the community, the report estimates its worth (Wyatt, 2015).

Sapere determines the effects of flood prevention on the community by considering how many assets the scheme protects and how likely it is that the absence of the scheme would destroy these assets. The Sapere report compares these easy-to-analyze dollar value assets to other intangible community assets the scheme protects, like human lives and disruption of everyday life. In order to do this, it was necessary to place a dollar value on many intangible assets gained by the scheme. The report found that, all things considered, the flood prevention community benefit was roughly 1.1 - 3.8 million NZD annually (Wyatt, 2015).

The flood protection land change affected a negligible part of the land (at most only around 90 hectares), however, the drainage and land erosion protection effects have a substantial benefit on the region. The study considered the minimum and maximum value of land protection using different land use scenarios with dairy farming having the most value and unproductive land having the least value. At minimum, the flood protection scheme provides a benefit of 6.0 million NZD and a maximum benefit of 30.1 million NZD depending on land use (Wyatt, 2015).

Sapere totals the value of the Lower Wairarapa Valley Development Scheme by adding community benefit to land benefit. The report concludes that the scheme is worth anywhere between 7.1 million and 34.0 million NZD every year. The current cost for the scheme for maintenance and capital expenditures is roughly 1.8 million NZD per year. Given this, the report estimates that the scheme's value to the region is between 5.3 million and 32.2 million NZD annually. The wide range of values is because land use without the scheme is variable and the report takes into account all possible uses of land without a flood prevention scheme (Wyatt, 2015).

However, the economic reports are subjective and do not always take into account intangible loss that occurs in the process. Sapere did not consider the importance of flowing water or rare ecological conditions impacted by the scheme. It's important to balance all of the effects of the scheme, both intangible and monetary, when ultimately deciding the optimum operation that benefits the entire Wairarapa community (Wyatt, 2015).

2.5 Stakeholders in the Wairarapa Region

The past developments dating back to the Treaty of Waitangi and tensions over the current setup create the need to understand the stakeholders in the Wairarapa Moana region. The

history of the region illuminates why the stakeholders disagree with each other over management of the lake. What is most beneficial for one stakeholder often negatively affects others. In the past, different levels of influence and power created an imbalance in discussions and decisions. This study will investigate how the Wairarapa Moana stakeholders perceive what is happening now and whether they want change. The following sections describe the background, interests, and influence of the Greater Wellington Regional Council and four of the stakeholders in this study.

2.5.1 Greater Wellington Regional Council

The Greater Wellington Regional Council is one of New Zealand's sixteen regional councils and is the governing body over the Wellington Region. The GWRC's mission is to "promote quality of life by ensuring our environment is protected while meeting the economic, cultural, and social needs of the community" (GWRC, 2015). The regional council works cooperatively with the city and district councils within its boundaries, to manage natural resources, and their uses (GWRC, 2015). Overall, the GWRC's responsibilities include: environmental management, flood protection, land management, provision of regional parks, public transport planning and funding, and metropolitan water supply (GWRC, 2015).

The Greater Wellington Regional Council describes their objectives in a publication called the Conservation Management Strategy for Wellington 1996-2005. This document describes guidelines, shown in Appendix A, for managing the ecological, cultural, and economic interests in the Wellington region. The guidelines emphasize the GWRC's concern about pollution, rare wildlife, and the Māori. The GWRC additionally published a document called the Memorandum of Partnership, which describes how they interact with the Māori (GWRC, 2015). They seek a mutual partnership with the Māori and want to remedy past grievances.

The GWRC is the sponsor of this project and wants to determine the perspectives of the relevant stakeholders before the barrage gates renewal in 2019. In Wairarapa Moana, the GWRC operates the Blundell Barrage Gates under the resource consent of 1999 (Airey, 2000). To maintain order in the region, the GWRC enforces policies such as the Lower Wairarapa Development Scheme and the Resource Management Act 1991 (Airey, 2000). The aim of these policies is to control resource management and conservation.

2.5.2 Rangitāne o Wairarapa

Rangitāne o Wairarapa iwi is one of two local Māori tribes that inhabit the land surrounding Wairarapa Moana. The iwi gets its name from an independent traveler known as Rangitāne who arrived in New Zealand 700 to 800 years ago (Grant, 2012). Following Rangitāne's arrival, he and twenty-eight generations of his family lived peacefully, fishing the longfin eel in the Wairarapa wetlands (Grant, 2012). After Europeans arrived, however, the Rangitāne lost the majority of their land. The crown purchased the lands of Rangitāne o Wairarapa throughout the 19th century and by 1900, only 5% of the land in Wairarapa remained in Māori ownership (Rangitāne o Wairarapa, 2014). The breaches in the treaty and the gifting of Māori land led to the degradation of Rangitāne culture and life.

Today, the Rangitāne tribe is relatively small, yet, they maintain their ancestral roles so that they can preserve their traditions, culture, and land (Potangaroa, 2012). As of 2013, the Rangitāne consist of nearly 4,700 people (Durie, 2014). The most recent move the Rangitāne iwi made to preserve their way of life is by pursuing a settlement, WAI 175, with the Office of Treaty Settlements. Currently, the Waitangi tribunal is discussing the WAI 175 claim which contains complexities regarding the actual size of the tribe (Rangitāne o Wairarapa, 2014). Once the Crown finalizes the claim, the Rangitāne will have a greater influence over the management of the lake. However, until the Crown makes a decision, the Rangitāne stated they will not discuss the matter (Rangitāne o Wairarapa, 2014).

2.5.3 Department of Conservation

The Department of Conservation (DOC) is the national agency responsible for protecting New Zealand's natural and historic heritage (DOC, n.d.). Early European settlement degraded much of the wildlife, ecosystems, and nature. Currently, New Zealand experiences urbanization and economic development. The DOC's mission is to allow New Zealand to develop and realize their vision of "ensuring that New Zealanders gain a wide range of benefits from healthy functioning ecosystems, recreation opportunities, and through living our history." (DOC, n.d.). The department's vision is to make New Zealand the greatest living space on Earth (DOC, n.d.).

On a large scale, the Department of Conservation maintains national parks, monitors endangered species, and offers recreational opportunities so people can experience the country's

beauty. Urbanization in New Zealand creates challenges for the department, regarding the country's preservation. Contrary to popular belief, New Zealand is not unmodified or 100% pure. For example, the country converted much of its forests into farmland. Through their management, the DOC protects many of the nation's natural treasures and continues working toward the conservation of life in areas such as Wairarapa Moana.

The DOC is responsible for the majority of the Lake Wairarapa wetlands under the Conservation Act of 1987 and the Reserves Act of 1977 (Airey, 2000). In 1991, the DOC met with stakeholders to form the Lake Wairarapa Coordinating Committee (LWCC) to produce guidelines for a unified and balanced management system of the wetlands. The LWCC met twelve times and developed four goals: to protect the Māori culture, to integrate land-use, promote recreational use, and to promote public understanding and support for the protection of the Lake Wairarapa wetlands (Robertson, 1991). The DOC 2000 - 2010 Plan of Action used these guidelines to help the region.

The Department of Conservation's past involvements display their interest in a solution that addresses the pollution in the lake and preserving Māori traditions. By determining an effective strategy to decrease pollution, the lake's threatened wildlife can grow to restore healthy populations. If the fish populations increase, the Māori could potentially support their fishing lifestyle again. Currently, the DOC aids the GWRC in monitoring Lake Wairarapa's fish populations. The DOC plan of action from 2000-2010 made progress to restore the wetlands, however Lake Wairarapa is still one of the ten most polluted lakes in New Zealand (Airey, 2000).

2.5.4 Landowners around the Ruamahanga Cutoff and barrage gates

The first Europeans entered Wairarapa in the 1840s and considered the area ideal for pastoral farming (Schrader, 2015). By 1844, settlers drove the first flock of sheep from Wellington onto the Wairarapa plains (Schrader, 2015). Over time, the Lake Wairarapa region transformed from grasslands into farmland. Farmers colonized the land and many grew rich by selling wool from sheep and butter from cows. By the 20th century, livestock numbers grew considerably due to less flooding and new technology. Low flood levels allowed for more pastures and new technology such as aerial top dressing of phosphate and lime improved grass

growth. The agricultural economy of Wairarapa started growing in the 1840s. To this day, pastoral farming remains the dominant profession in the Wairarapa workforce.

Currently, the farmers control more than 10,000 hectares of Wairarapa Moana land. The 10,000 hectares divide into 6,500 hectares of forestry block, 2,870 hectares of dairy land, and 1,325 hectares of sheep and beef pastures. Over time the number of farms decreased, however; farms are now larger and produce more per hectare. In 1965, the average farm was 70 hectares with a herd size of 83 and milk production of 126 kilograms per day. Almost fifty years later, the average farm today is 132 hectares, has 366 cows and produces 206 kilograms of dairy per day (Schrader, 2015). Water levels impact a significant number of the landowners, who control the majority of the land adjacent to the lake.

2.5.5 South Wairarapa District Council

The South Wairarapa District Council is one of three local district councils: Masterton, Carterton, and South Wairarapa and governs over Featherston, Greytown, and Martinborough. The council serves and welcomes residents and visitors alike in the district. The territory resides at the southern corner of the north island and is approximately 248,455 hectares (SWDC, n.d.). There is one mayor and one council consisting of eight councilors. This local government body is responsible for mostly civil aspects of the region such as road maintenance, property rates, and garbage removal in addition to offering a swimming pool, library, and health services to the public (SWDC, n.d.). Furthermore, the SWDC manages urban parks and rural reserves day to day and its district contains three forest parks, beaches, vineyards, and sheep and dairy farms. The Local Government Act and the Resource Management Act specifies the different responsibilities of district councils and the responsibilities of regional councils (D. Boone, personal communication, January 21, 2016)

In Wairarapa Moana, the South Wairarapa District Council administers the Lake Domain Recreation Reserve at the north end of Lake Wairarapa under the Reserves Act of 1977 (Airey, 2000). The district council is responsible for controlling the harmful human effects on the wetlands. This includes hunting, boating, and driving motorized off road vehicles around the lake. The SWDC is also responsible for implementing their district plan to control the drainage of the wetlands and diversion of waterways in the wider catchment (Airey, 2000).

2.5.6 Recreational Water Users

Another aspect of the resource management conflict on Wairarapa Moana is its recreational water users, specifically the barefoot waterskiing club and the boat club.

The waterskiing club is a competitive group who participates in large tournaments and even contains a number of world champions and national champions. They have been practicing on the Ruamahanga Cutoff since the 1970s, mainly because there aren't many other bodies of water in the region with the same calm, secluded conditions as the cutoff. In the early days of the barefoot water skiers club, there were international tournaments held on the cutoff. A barefoot waterskiing tournament consists of three main components, jumping for distance, two 15 second trick passes and a series of slaloms. "Tournament water skiers" also use the cutoff for training. Tournament waterskiing is like barefoot, except they are on skis and many of the aspects are on a much larger scale (ie. the jumps and tricks.) Where there are many casual water skiers on the diversion, the club members are the prominent recreational water users of the Ruamahanga Cutoff.

The boat club primarily uses the Ruamahanga diversion for their recreational activities. There is a small shack and boat ramp at the water's edge that they use. They are currently in talks with Greytown Sport about joining that organization. That will help the boat club organize their activities and budgeting.

2.6 Waitangi Tribunal Settlement

Rangitāne o Wairarapa initiated a land settlement claim with the British Crown in 2011, regarding breaches in the treaty of Waitangi. The British Crown developed a settlement agreement on March 28, 2014 for 32.5 million dollars with Rangitāne o Wairarapa and Rangitāne o Tamaki Nui-A-Rua iwi (Office of Treaty Settlements, 2014). This settlement includes the return of seven Crown-owned sites to the local iwi. Although, both parties signed the deed of settlement, the Crown is still investigating competing claims and finalizing the settlement.

There are multiple claimant groups who are trying to declare ownership over the Wairarapa Moana region besides the Rangitāne. The two main iwi groups in Wairarapa Moana include the Kahungunu ki Wairarapa and Rangitāne o Wairarapa, who both have conflicting claims regarding the land. The main conflict is over which hapu have lineage tracing back to which iwi. This is an issue because the origin of the hapu determines which iwi receives the land as a result of the settlement process. It also brings forth the issue of cultural identity. The main lineage feud is over the Ngati Hamua, with which both iwi claim ancestry. In Māori culture, the tribe members do not own land. They lease and pass the land down through ancestral lines. Combining all of these aspects makes the land claim challenge political, cultural and legal in form (Crombie, 2015).

The Crown acknowledges their breaches in the Treaty of Waitangi and the damages that their actions inflicted upon the Rangitāne. The bullets below summarize the Crown's acknowledgements:

- Falsely acquired land through expired Pakeha leases
- Failed to properly sell and pay for the land they acquired
- Failed to survey the land they acquired
- Did not provide the educational, health and economic benefits as promised
- Failed to develop accessible reserves in a timely manner
- Inflicted landlessness and severe cultural impacts on the Rangitāne iwi

(Office of Treaty Settlements, 2014 pgs: 42-43).

The Crown apologizes for the techniques used to acquire the land from the Rangitāne. This demonstrates the current national effort of restoring their cultural identity and reconciling for past grievances. The settlement established the Rangitāne as a statutory authority over the Ruamahanga River and its tributaries, where they will work closely with the DOC with management going forward. This treaty settlement will increase the influence of the Rangitāne, and will allow them to participate in decisions in regards to land management (Office of Treaty Settlements, 2014).

2.7 Future Outlook

As part of the Treaty settlement process, the Waitangi Tribunal recommends the return of all public land at Wairarapa Moana (Office of Treaty Settlements, 2014). Several different organizations currently manage the land. This division of power occurred after the Māori gifted the Wairarapa Moana region as public land to the Crown in 1896. The Department of Conservation manages the pastures, wetlands and forest in the region (Flack, n.d.). The South Wairarapa District Council is responsible for the Lake Domain Recreation Reserve and the Greater Wellington Regional Council regulates the floodwater reserves (Flack, n.d.). In order to plan for the future of the Wairarapa Moana region, the council members from the SWDC, GWRC and DOC “met with Kahungunu ki Wairarapa, Rangitāne o Wairarapa and hapu representatives” to create the plan for the Wairarapa Moana Wetlands Park. This is an effort to reconcile past grievances and move forward with a plan that encompasses all points of view (Flack, n.d.).

The GWRC, DOC, and other organizations in the area plan to restore Wairarapa Moana to a highly valued region that inspires the future. The focus of the GWRC, DOC and other organizations in the area is to improve the current conditions so that native plants, animals, and ecosystems can thrive and the wider community can benefit from what the region has to offer (DOC & GWRC, 2015).

Researching, investigating, and planning are imperative to ensure effective ecological restoration efforts. They provide a strong foundation for decision making regarding potential management operations. Although the GWRC and DOC can acquire much information through research, investigations, and plans, it is often necessary to perform field tests to ensure that the implemented efforts are improving the conditions of the region. The Greater Wellington Regional Council studies the effect of various control regimes on native fish and monitors wading birds and waterfowl regularly. This provides the GWRC with feedback in order to evaluate their management schemes. Efforts such as these are in operation at Boggy Pond, Matthew’s Lagoon, Wairio Wetland, JK Donald, and the Blundell Barrage Gates.

There are various weed control efforts in place in order to improve current conditions for native plants. Boom spraying, ground treatment, and spot spraying from helicopters are all techniques in which the GWRC and the DOC control exotic terrestrial weeds as shown in Figure 22. Controlling weeds facilitates the growth of native plant dominance by increasing size and abundance. The GWRC and DOC control aquatic exotic weeds through physical, chemical, and

biological methods that reduce growth of weeds or remove them. Existing biodiversities are the priority and the GWRC and DOC spend the majority of their budget for the region on the areas that are most intact. They plan to use biocontrol agents in the future if native species populations do not increase up to standards.



Figure 22 - Mathews Lagoon, Sprayed Willows (Silbery, 2011)

The main goal of pest animal control in the Wairarapa Moana is to reduce predator populations in order for native species to breed successfully. Today, efforts by the GWRC and the DOC focus on land animals, however, exotic aquatic species are also a concern. Trapping is the main form of pest control and research on wetland birds is an ongoing effort. In 2016, the Greater Wellington Regional Council will use trail cameras to evaluate the impacts of predators in selected areas containing Caspian tern nests. Ultimately, the need to increase the native animal population drives these efforts, which will continue until these species can thrive.

Other efforts to protect the ecology of Wairarapa Moana include legal actions, surveillance, and case studies. The GWRC and the DOC will use monitoring programs and one

year management agreements which will provide feedback to the GWRC and will ensure that all parties in the agreement uphold standards and regulations. The GWRC and DOC use biosecurity surveillance to confirm that new invasions do not occur.

Independently, residents can take initiative to improve the overall ecology of Wairarapa Moana. Planting stream edges can help increase future aquatic species population since many enjoy bush-covered streams. Additionally, fencing stream edges will help prevent stock from trampling habitats and some aquatic species' eggs. Altering dams and culverts to allow young fish to reach adult habitats would also allow for more breeding, and eventually higher aquatic population numbers (DOC). These efforts, among others assist the GWRC and the DOC in moving towards the overall goal of improving the conditions of Lake Wairarapa (DOC & GWRC, 2015).

2.8 Resource Consent

2.8.1 Resource Management Act

In 1991, the New Zealand government created the Resource Management Act with the intent to ensure that local governments sustainably manage the environment. In order to accomplish this, the Resource Management Act requires approval for activities that could affect the environment granted through resource consents. The South Wairarapa District Council works with resource consents regarding civil matters while the Greater Wellington Regional Council deals with resource consents regarding natural resources. In the Wairarapa region, schemes to the north along the Kopuaranga, Taueru, and Whangaehu rivers do not require resource consents because flood prevention requires minimal activity. However, schemes along the Waiohine, Waingawa, Waipoua, and the Upper Ruamahanga rivers along with the Lower Wairarapa Valley Development Scheme all require resource consents due to the extent of the efforts necessary to control flooding (D. Boone, personal communication, January 21, 2016)

There are a number of different applications for various types of resource consents including land-use consents, water permits, discharge permits and applications for other aspects of environmental change. In order to obtain a resource consent, a person must apply via their local council. Once groups submit an application, the council examines it to determine whether

or not the resource consent application complies with the Resource Management Act. If it does not, the local council works with the applicant to develop a plan that coincides with the legislation. Activities that cause significant environmental change require the consensus of all parties impacted and mandate a hearing if the stakeholders cannot reach a consensus as seen in Figure 23. Any activity that affects the environment requires a resource consent and anyone can apply.

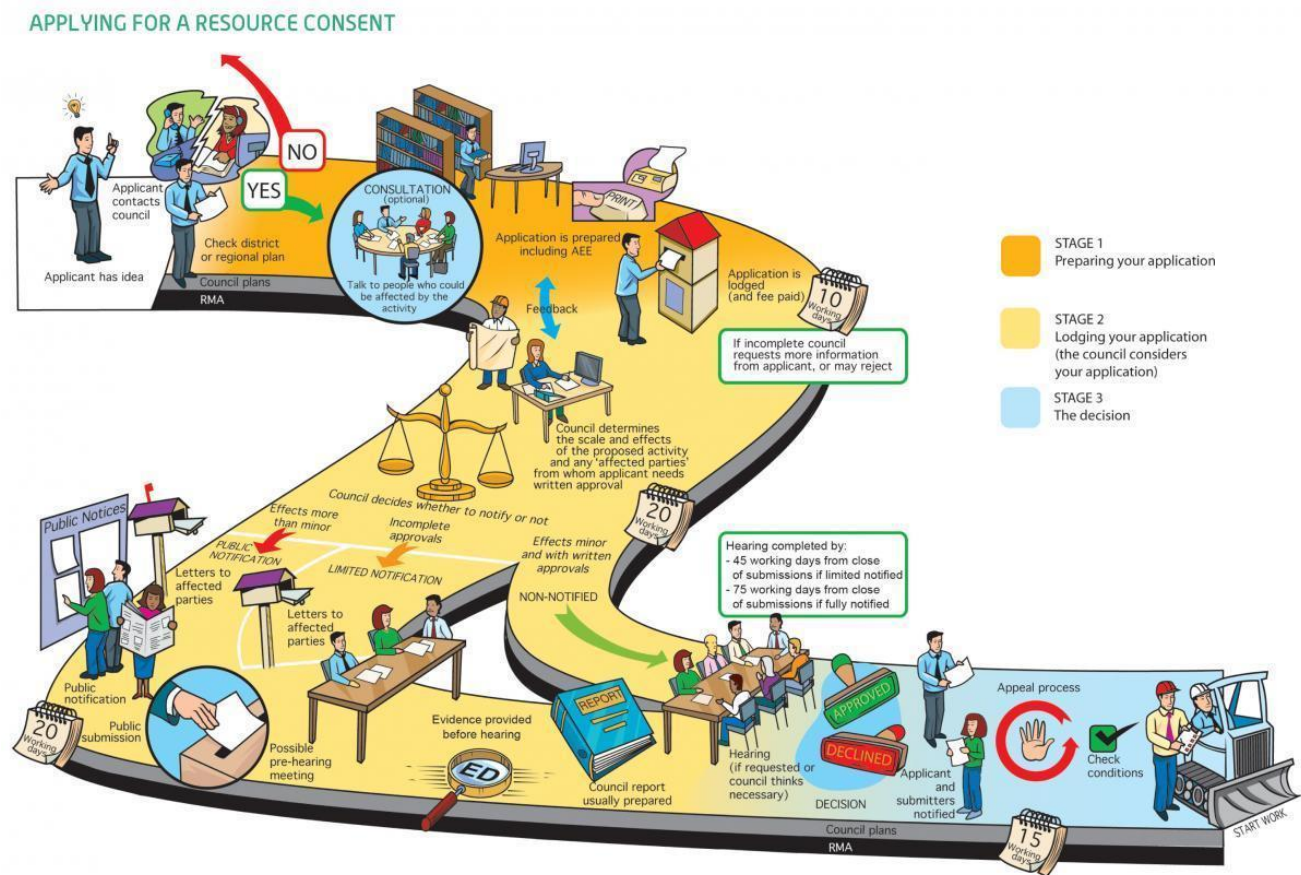


Figure 23 - The process of applying for a resource consent involves many facets of the local community. It is important to consider all environmental impacts and their social implications. (Ministry for the Environment, 2015)

The Resource Management Act requires the GWRC to obtain a resource consent for the management of barrage gates because they dam and divert the water system. The Greater Wellington Regional Council's Department of Flood Protection operates the barrage gates and therefore is responsible for the resource consent application. The GWRC is also the local governing council that approves resource consent applications, which seems to be a conflict of interest. However, since the barrage gates have a significant impact on the environment, the

resource consent must go through an independent commissioner panel with no GWRC affiliation. The commissioner panel consults with all stakeholders affected by the barrage gates. Any opposition to the application results in pre-hearing meetings between the GWRC and the conflicting stakeholder in attempt to reach a compromise. If there is still opposition, the commissioner panel conducts a hearing with the Flood Protection Department of the GWRC and the concerned parties. From the hearing, the panel decides whether or not to grant the resource consent (S. Andrewartha, personal communication, December 9, 2015).

2.8.2 Barrage Gate Resource Consent History

Prior to 1999, the Greater Wellington Regional Council operated the barrage gates based on a government order and not a resource consent. The New Zealand National Government passed the Resource Management Act in 1991, and in 1993 the GWRC began the application process for the resource consent now required for the gates. The application noted operating procedures will remain the same as before with the exception of minor seasonal variations to aid fish migration and specified maintenance procedures (Greater Wellington Regional Council, 1999).

Rangitāne o Wairarapa, Kahungunu ki Wairarapa and the South Wairarapa District Council's Māori Standing Committee all opposed the application submitted by the GWRC. These groups requested the monitoring of the lake, including ecological assessments, Māori participation in the management and monitoring of the lake, and a shorter term for the resource consent (Greater Wellington Regional Council, 1999).

The Department of Conservation and Wellington Fish and Game Council gave conditional support to the application, also noting the importance of a shorter term for the resource consent and requesting the monitoring of ecological effects (Greater Wellington Regional Council, 1999).

The farmers around the lake and a duck hunting advocacy organization called Ducks Unlimited supported the application in its entirety. The farmers also noted that deviation from the current scheme could have “intolerable effects” (Greater Wellington Regional Council, 1999).

The GWRC addressed these concerns by modifying their application to reflect any concerns of the stakeholders in the region. The largest areas of concern were the resource

consent's term length and ecological monitoring. The GWRC determined that, although many parties in opposition expressed the need for a shorter term, the original twenty year term was acceptable. However, the council recommended a liaison meeting with the stakeholders every five years to review operation and concerns. The DoC aided in the monitoring of the lake to ensure that the barrage gates were not causing significant ecological harm (Greater Wellington Regional Council, 1999).

In a report regarding the resource consent, the Greater Wellington Regional Council noted that they would assess the actual and potential effects on the environment. This included the effects of current lake target levels and the effects of barrage gates on flooding, recreation, and wildlife. The report outlined the appropriate management scheme pertaining to each aspect. Today, this information is useful regarding the current application process (Greater Wellington Regional Council, 1999).

As the council begins to prepare a resource consent application for the barrage gates in 2019, it is important to also consider effects brought to their attention by current stakeholders. It is the aim of this project to evaluate the desires of residents in the Lower Wairarapa Region so that the Greater Wellington Regional Council can construct a resource consent application that meets minimal public opposition.

Chapter 3 – Methodology

This project's focus is to detail the points of view of each stakeholder group and improve communication within the Wairarapa Moana community regarding the management of Lake Wairarapa. To address the resource management conflict in Wairarapa Moana, we developed the following objectives:

- To observe and gain understanding of the current political, ecological, economic, and cultural situation in Wairarapa Moana
- To identify the perspectives and needs of each stakeholder group regarding the management of Lake Wairarapa
- To determine common interests, concerns and major differences by highlighting recurring themes.

3.1 Methods

We used interviews to identify the attitudes of each of group of stakeholders in this study. We gathered accurate data with wide representation through different sampling methods that match the dynamic of each stakeholder. Ian Gunn, our sponsor liaison, set up the initial contact with the key stakeholders.

3.1.1 Sampling Methods

Non-probability sampling methods are non-random techniques of gathering subjects for a study. These sampling methods are the most appropriate for our project because it is necessary to interview specific people. Our sponsor liaison, Ian Gunn, provided us with a list of interviewees and their contact information. Types of non-probability sampling we will use include availability, expert, snowball and purposive sampling.

Availability sampling is when the researcher interviews any available subject from a target group. This is acceptable when the demographic diversity is not important or when interviews are for informative purposes (Trochim, 2006).

Expert sampling is creating an interview pool of highly skilled and knowledgeable people from an applicable field. This allows the interviewer to target specific individuals who can often present exclusive information that can be difficult to obtain (Trochim, 2006).

Snowball sampling is an interviewing technique in which the researcher uses an existing subject to recruit future subjects. It is the interviewer's responsibility to inquire about who to possibly contact next. Snowball sampling is useful if the researcher targets specific information but does not know who to contact next. Often times, experts in a certain field know who the other experts are and they can recommend new contacts to the researcher (Trochim, 2006).

Purposive sampling is the use of subjects based on what the researcher deems appropriate for the study. In our case, that meant contacting members with the most involvement, the most knowledge or simply with a variety of experience. This is the predominant method that our study utilized. Considering that Ian Gunn selected most of our interviewees, it is important to note that our sampling method is not random. As this investigation strives to determine the general opinions from each stakeholder, it is not necessary to randomly select subjects. Instead, interviewing a variety of members of each respective stakeholder group gave us an understanding of how different individuals viewed each respective issue (Trochim, 2006).

3.1.2 Interview Methods

When determining which type of interviews to use for each stakeholder, we considered the size and structure of each group. We considered different methods for each stakeholder, but ultimately used open-ended interview questions for all interviews. These questions allow the interviewee to elaborate and discuss their response freely and in depth. Open-ended interviews have a very loose structure and resemble a guided conversation in order to obtain information.

Semi-structured interviews allow free discussion but also have a structured plan for conducting the interview. These interviews contain a set list of questions, but offer flexibility to ask supplemental questions. Since semi-structured interviews are moderately conversational, the interviewer always asks the entire predetermined question set.

3.1.3 Interview Protocol

Interviews for this project required similar protocol. For stakeholder interviews, two of our team members conducted the interviews. This was important so that the interviewers did not overwhelm the interviewee. One person took notes and the other asked the questions. The entire team attended informative interviews with the GWRC in order to collectively learn the information.

We recorded stakeholder interviews via a video camera whenever the interviewee gave us permission and we always took notes to supplement the video in case it was inaudible. Back-up recording equipment ensured that if there were technological issues, such as battery life, there would be no issues with recording the entirety of the interviews. We reviewed all our interviews and transcribed the recorded audio scripts into text. The interview protocol sheets for each stakeholder group in this study are attached in Appendix C.

3.1.4 Participant Observation

Participant observation is a qualitative form of research that involves identifying multiple perspectives among a target group through interaction during everyday activities. This allows the researcher to be an “insider” while remaining an “outsider” to gain information through observation without necessarily having an impact on the given situation (Family Health International, 2009). Participant observation is useful when the researcher expects to understand a variety of information and when their involvement will not alter the results of the data collected.

We used participant observation as a tool to develop an “on-the-ground” understanding of the resource management conflict. The Greater Wellington Regional Council introduced the area and gave us a tour of Lake Wairarapa. This allowed us to explore, photograph, and document our experience of the region as a supplement to our research.

3.1.5 Question Types

To best determine the stakeholder’s points of view, we developed respectful, unbiased, carefully deliberated, and relationship-oriented interviews. To plan our interviews, we chose the appropriate questions for the Rangitāne, DOC, SWDC, landowners, and recreational water users

listed in Appendix C.3, C.4, C.5, C.6, and C.7, respectively. The team broke these questions down into three sections: knowledge, perception, and demographic. It was important to remain unbiased when asking all questions so as not to influence the responses of each stakeholder.

Our interviews asked open-ended, factual-based questions to evaluate public knowledge of Lake Wairarapa's resource management. The purpose of these questions was to gauge the stakeholders' knowledge of all facets of the resource management conflict: the water quality, flood levels, and the resource consent. Determining how well people understand the current situation is important for the management of the lake. Lack of understanding demonstrates that the GWRC needs to make communicating effective to the rest of the community a higher priority. It is important that everyone affected by the scheme is aware of how it operates in order to get accurate, meaningful feedback regarding the management.

The demographic questions were personal and designed to be straightforward. They asked the stakeholders about their personal background and involvement within the Wairarapa region. We needed this information to cross-correlate the answers to the demographic questions with both the knowledge and perception questions to help us better understand the responses. Evaluating similarities and differences within and between stakeholder groups provided us with the information to develop our analysis.

The perception questions asked the stakeholders their opinions regarding the current and future flood management. To fully understand each of the stakeholder perspectives, we asked what, how, and why. We asked *what* their thoughts are in order to identify their interests. We asked *how* they value the region in order to determine how the stakeholders gauge their interest levels. Lastly, we asked *why* they desire certain outcomes in order to understand the motivations behind their interests. The last question we asked was always the same: "If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?" This prompted the interviewee to identify their top priority and what they wanted done to address it.

To enhance the effectiveness of our interviews, we tested our questions on three Greater Wellington Regional Council employees before our official interviews began. We asked each interviewee a different set of questions in order to ensure they all flowed properly in an interviewing setting. We used the interview protocols from the Rangitāne o Wairarapa, Department of Conservation, and the South Wairarapa District Council protocols, which are in

Appendix C3, C.4, and C.5. The team chose not to pretest the landowner questions as we intended them to be answered by landowners specifically.

This pre-test interview process confirmed that our questioning structure of asking knowledge-based questions in order to understand what the interviewee knew, followed by perception questions that matched the individual's knowledge allowed for an organized interview. We only made minor changes to our question order and wording as a result of pre-testing. Our questioning structure allowed us to be flexible when asking questions and skip over questions if the interviewee was not knowledgeable and we confirmed this by conducting the pre-test interviews.

3.1.6 Analysis Methods

In order to quantitatively categorize data, we coded the results of our interviews. *Coding* is a method of sorting qualitative data gathered from interviews into more concrete quantitative data using a number of defined coding categories. Using coding allows the researcher to classify interviews based on key topics the interviewee spoke of in order to highlight the main idea of each response (Gordon, 1992).

3.2 To observe and gain understanding of the current political, ecological, economic, and cultural situation in Wairarapa Moana

In the first two weeks, we dedicated our time to observing the current situation in order to broaden our initial background research. The team addressed any problems with work space, transportation, and meeting times with the sponsor. Performing participant observations helped us better understand the region. We accomplished this through visits to Lake Wairarapa, attending a Wairarapa Moana Coordinating Committee meeting, and participating in a welcoming ceremony at the Kohunui Marae. Ian Gunn, our sponsor, and a Māori representative, Ra Smith, set up the visit to Lake Wairarapa so that they could explain the cultural logistics of the region from an on the ground perspective. Our project team attended a Wairarapa Moana Coordinating Committee meeting to observe the current political situation in the region. This was a meeting of representatives of several stakeholders of Wairarapa Moana to discuss various

issues. The welcoming ceremony at Kohunui was important to introduce the team to Māori culture. Figure 24 demonstrates how we investigated the political, ecological, economic, and cultural situation in Wairarapa Moana.

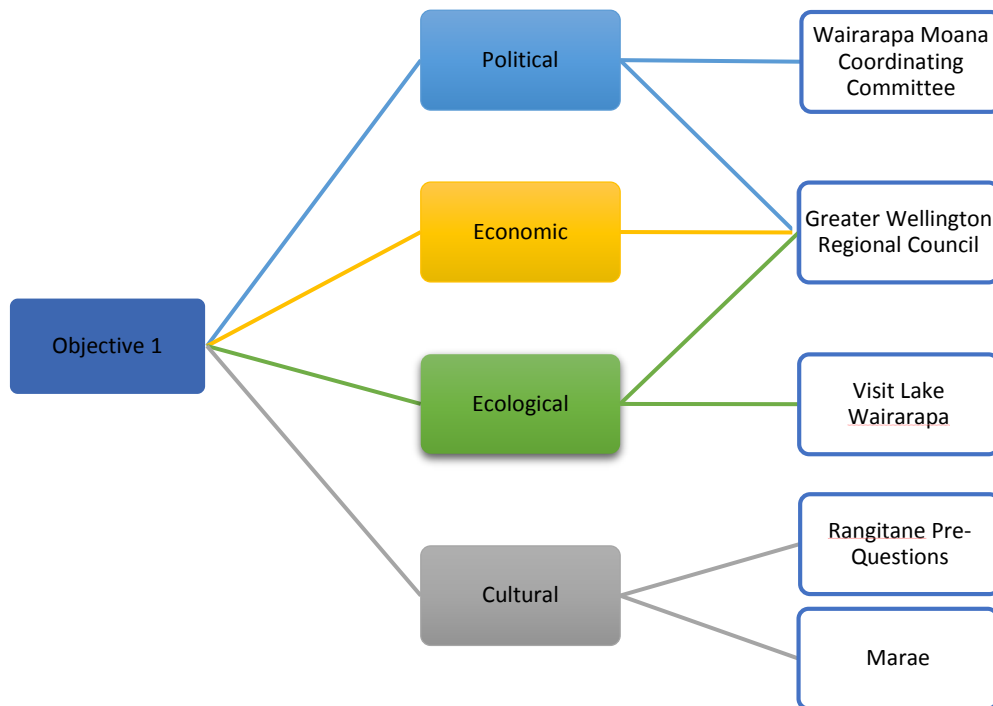


Figure 24 - Objective 1 flow chart

To gather further information about the politics, ecology and economy of the region, we spoke with David Boone of the Greater Wellington Regional Council using the protocol attached in Appendix C.2. The purpose of this interview was to acquire information about the specifics of the project background and to gain expert knowledge from the GWRC. We used more technical and specific questions than in our stakeholder interviews and the information collected contributed to refining our stakeholder interview questions and the goals of the project.

In order to ensure that our interview questions covered the necessary information for our stakeholder interviews, we pre-tested the questions on three GWRC employees and used the feedback from these mock interviews to improve our interview protocols. In the practice interviews, we tested each stakeholder protocol by asking the corresponding set of questions. We

paid close attention to the flow of conversation and ease of response by the interviewee, in order to improve the order and the content of the questions.

Speaking with the Greater Wellington Regional Council, attending the Kohunui Marae welcoming ceremony, and sending initial questions to a Māori representative helped us to better prepare and understand the current cultural situation. This correspondence provided knowledge about the specific cultural needs and expectations of the Māori. The feedback received from the Greater Wellington Regional Council and the Māori representative helped refine our questions for the interviews with the Rangitāne.

Overall, our first two weeks on the ground allowed our team to develop a strong foundation of the current political, ecological, economic, and cultural information valuable to the completion of this project's objectives.

3.3 To identify the perspectives and needs of each stakeholder regarding the management of Lake Wairarapa

Stakeholder perspectives and needs in Wairarapa can vary for several complex reasons that stem from political, ecological, economic, and cultural interests. To identify the different interests, our team conducted interviews. The interviews targeted the leaders, professionals, and experts in the following groups (see Figure 25): Rangitāne o Wairarapa, Department of Conservation, landowners, recreational water users and South Wairarapa District Council. The goal of this study was to gather the stakeholder points of view so that our team could present each of the various views in a manner that is most valuable to the public and Greater Wellington Regional Council. Table 3 shows how many people we interviewed and a breakdown by stakeholder group association.



Figure 25 - This project's five stakeholders

Table 3 - Stakeholder Interviewee Breakdown

Stakeholder Interviewee Breakdown (29 total):	
Department of Conservation:	7
Rangitāne o Wairarapa:	4
South Wairarapa District Council:	6
Landowners (8 total)	-
around cutoff:	3
around barrage gates:	5
Recreational Water Users	4

3.3.1 Rangitāne o Wairarapa

Rangitāne o Wairarapa Iwi, headquartered in Masterton, has cultural interests in Wairarapa Moana that stem from their heritage, livelihood, and values. Although we researched their past interests, we found it important to reevaluate their current interests and investigate how they would like the Greater Wellington Regional Council to manage the lake.

The major research objective of the Rangitāne interviews was to collect the points of view of as many tribal leaders, experts, and general members as possible within four week period from January 18th to February 19th. The Rangitāne interview protocol, shown in Appendix C.3, describes the goals, planning, and questions for each interview with the Rangitāne. Ian Gunn provided us with contacts, who we reached out to in order to set up interviews with the iwi members as described in the interview protocol. In each interview, the guiding principle was to respect the Rangitāne and work with them to understand their attitudes toward resource management in Wairarapa Moana.

3.3.2 Department of Conservation

The Department of Conservation is the national organization tasked with preserving New Zealand's natural resources. To determine the DOC's wishes for the management of Lake Wairarapa, we conducted semi-structured interviews with DOC employees, many of whom are experts, regarding the environmental concerns of Wairarapa Moana.

Many of New Zealand's professional and expert ecologists are part of the Department of Conservation. To understand the resource management conflict in respect to its environmental impacts, we interviewed these specialists. The interview protocol, attached in Appendix C.4, explains our sampling, questioning, and goals for interviewing DOC. The main objective of interviewing DOC was to develop an understanding of the ecological interests in the region, especially concerning birdlife, fish and vegetation. We asked technical environmental questions in addition to the open-ended questions that were commonly asked to the other stakeholders. Through expert and snowball sampling techniques, we gathered many opinions within DOC on flood levels, water quality, native species, recreation, and the resource consent. This categorization illuminated the prevalent ecological interests within DOC and was useful for our analysis.

3.3.3 South Wairarapa District Council

The South Wairarapa District Council is the local governing body consisting of an executive council, three different community boards, and a Māori standing committee. They are concerned with promoting the economy within the South Wairarapa region. We were able to determine the viewpoints of this stakeholder through semi-structured interviews with councilors, council employees and a Māori standing committee representative.

To identify the major economic and political interests in Wairarapa Moana with regard to the resource consent renewal, the interviews included both open-ended and technical questions. Sampling for these interviews targeted council members, community board members, and members of the Māori standing committee in order to gather the essential information pertaining to the interests of the council. The protocol and questions for these interviews are found in Appendix C.5. Our team tailored interview questions to delineate how these individuals view the current flood protection scheme and how changes could benefit the local community. We collected the SWDC's responses in order to develop an overview of their concerns.

3.3.4 Landowners around Ruamahanga Cutoff

We expected the landowners near the Ruamahanga Cutoff to have different opinions compared to the other stakeholders because of their use of the land in close proximity to the lake. Using purposive sampling, Ian Gunn determined a list of landowners to interview. Semi-structured interviews helped accurately determine the landowners' opinions by asking questions from a set list, but having the freedom to elaborate. To collect thoughts regarding the barrage gate operation, the team developed questions that prompted landowners' opinions on the future operations of the barrage gates. The interview protocol and questions listed in Appendix C.6 illuminated how the landowners feel about the current flood protection scheme and whether or not they would like to see changes in the upcoming resource consent renewal.

3.3.5 Recreational Water Users

Upon arrival in New Zealand, Ian Gunn tasked our project group with interviewing a group of barefoot water skiers and a boating club. We interviewed three water skiers, but were only able to contact a representative of Greytown Sport, an organization involved with regional

recreation activities, but is not currently affiliated with the boat club. We developed a set of interview questions as described in the protocol in Appendix C.7. The interviews were semi-structured to allow for conversation and elaboration. Considering the project team's very limited knowledge of barefoot waterskiing, it was imperative that we asked questions to help us understand the sport, its technical requirements and their use of the waterway.

3.4 To determine common interests, concerns, and major differences by highlighting recurring themes

In 2019, the Greater Wellington Regional Council needs to renew the resource consent, which details the management of the Lower Wairarapa Valley Development Scheme. In order to develop an application for the resource consent that accommodates the community, the GWRC must consider the common interests and concerns encompassing all of the stakeholders. It was important that our project detected and pointed out these common themes to deliver to the GWRC. We accomplished this by coding our interviews and noting stakeholders' interests, drawing conclusions from the data about commonalities and differences, and presenting a final report and presentation to the GWRC.

3.4.1 Transcribing the stakeholder interviews

We used transcription, seen in Appendix E, in order to convert all of the stakeholder interviews into usable text for the coding process. Transcription for the landowners, DOC and SDWC were as complete as necessary without committing to verbatim. The Rangitāne interviews, however, required verbatim transcriptions in order to capture the accurate holistic responses that the Rangitāne provide. The Māori people dislike when outsiders attempt to put their sayings and customs into their own words, so it was important that we respected this by transcribing their interviews in their entirety.

3.4.2 Coding the stakeholder interviews

Coding the interviews allowed us to achieve quantitative results from otherwise qualitative data. We used key phrases and topics to sort each interview based on the interviewees' attitudes regarding the management of Wairarapa Moana, regarding a variety of

aspects. It is important to note that we did not determine the key phrases until after the interviews and transcription processes, in order to not limit the potential categories by preconceived bias. Our coding categories served as a tool to identify popular ideas for future operation as well as to discover the common issues, conflicts and concerns with the current flood prevention scheme. The categories also highlighted topics of interest within the community, such as conservation efforts, recreation, and overall communication. Once we transcribed, we were able to choose the key phrases from the interviews to use in our analysis.

We worked as a group to determine these key topics based on the responses from all of the interviews. Three group members independently coded roughly a third of the transcripts from the interviews and the last member reviewed, summarized and sorted the coded data into the respective topics. We organized this data in a Microsoft Excel spreadsheet in Appendix G. For example, one of our coding topics was flooding and we grouped all of the summarized responses related to flooding on this spreadsheet for later review and comparison. As we coded, the coding topics were fluid so that we could add new categories if there was an important interview comment that didn't fit into a previous topic.

3.4.3 Analyzing the stakeholder interviews

Looking at the data from the coding, we could determine which topics were controversial and which were not. For topics that were not controversial, quantitative analysis was not necessary because it was easy to determine the common response of the interviewees without a numerical breakdown. However, controversial topics required a quantitative analysis where we organized the responses for comparison. We developed categories within the controversial topics for response types based on how interviewees responded. The team then used Microsoft Excel to organize the quantitative data collected from response categories. With this data, we created graphs in order to develop effective visuals. It was important to also qualitatively analyze any unique or interesting responses that we noticed while summarizing each answer. It was then easier to see trends among stakeholder groups while not losing the individuality of each response.

The overall analysis needed to evaluate each stakeholder equally. Our team conducted more interviews within some stakeholder groups than others so it is important that we distinguished stakeholder groups to avoid skewing data by effectively increasing one group's

voice in the results. To avoid this, we broke down our analysis by stakeholder and topic. This allowed for easy comparison within and between stakeholder groups.

Ultimately, the goal was to produce a series of commonalities and discrepancies identified from interview responses. We analyzed the coded data from our transcriptions and created graphs to highlight important quantitative data. Our project team identified unique stakeholder opinions, common themes and differences in opinions for the GWRC to satisfy their interests.

3.5 Important Considerations

The Māori have a long history of outsiders disregarding their rights and cultural beliefs. Therefore, awareness of this history was important when conducting discussions and interviews (Grant, 2012). There is a potential language barrier specifically regarding the pronunciation of the Māori words. We made sure to pay special attention to speaking correctly and thoughtfully during interviews. It was important to learn the Māori pronunciation of words and to be mindful that the Māori do not look superiors in the eye and instead look down. The manner in which we conducted our interviews was to coincide with this belief out of respect and to provide the interviewee with a comfortable environment in which they could easily respond to the questions we asked. Additionally, the Māori are not trusting with some of the information that we discuss. Therefore, it was important that we kept all information within the context of the response and transcribe all responses from the interviews to avoid any confusion or misunderstanding. Overall, we respected their practices and cultural differences, and tried to understand basic cultural cues in order to have effective interviews and a successful project.

It was important to acknowledge that we are an external party and the local community should sponsor and address solutions for the resource management issue. Asset Based Community Development (ABCD) describes this idea: local groups should not be subject to a heavy outside influence on matters that concern their own community (Northwestern University, n.d.). It was not within the scope of our project to offer a list of recommendations regarding the lake management. We gathered information from interviews and objectively presented it in our analysis to the GWRC. The GWRC will ultimately use this information to attempt to build a consensus when applying for the resource consent.

3.6 Methodology Overview

Figure 26 is a Gantt chart that visualizes the time utilized for each objective.

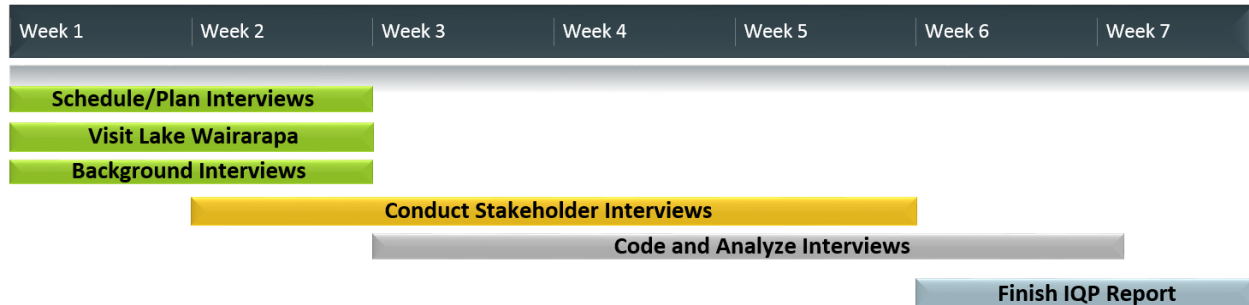


Figure 26 - Gantt chart

Our project team gathered data and information on schedule through the methods provided. The group analyzed interview data later than expected due to the large amount of information gathered and time spent transcribing interviews, yet, the schedule of the Gantt chart allowed the group to keep on task and meet deadlines. Doing so allowed our team to be flexible and allot adequate time to thoroughly analyze all the collected data. The project's data and analysis is the next chapter.

Chapter 4 – Data and Analysis

4.1 Participant Observation and Initial Activities

The two first two weeks of our project involved becoming acclimated with the Wairarapa Region, and understanding the intricacies of the political, economic, cultural and ecological situations there.

4.1.1 Introductions to the Greater Wellington Regional Council

On the first day of work, January 14th, the project team went to the Greater Wellington Regional Council's (GWRC) office at Shed 39 in Wellington in order to present our proposal and to meet with our Sponsor and other interested parties within the GWRC. During this meeting, David Boone, the section leader of the Wairarapa Flood Protection Department gave a presentation on the Lower Wairarapa Valley Development Scheme. He is responsible for managing where the Ruamahanga River flows and trying to keep it within mathematically determined boundaries. He explained how the scheme pushes flood waters out of the system after a day or two. Prior to the scheme, the water levels returned to their natural state after about a week. David also noted that they have models that predict where the water from the surrounding mountains may flood. This enables the GWRC to warn the landowners and give them ample time to move stock and prepare. The GWRC tries to open the spit as soon as possible when Lake Onoke blocks, because if there was a serious flood event, it would cause a number problems in the region. David explained how Lake Onoke needs to be at an optimum level of twelve meters in order to get adequate head pressure to reopen the spit. If the GWRC opened the spit without sufficient head pressure, the spit re-blocks.

The presentation highlighted that sediment is slowly building up along the sides and bottom of the Ruamahanga River. If this continues without control, it will render the flood protection scheme less effective. Therefore, instead of handling a 50-year flood event, it may only be able to handle a 20-year flood event. This maximum flood capacity could continue to deplete in the future if the community and the regional council do not take action. At the end of his presentation, David discussed potential problems that could devastate the scheme and the region. If an earthquake tilted the barrage gates, they would not work. He said currently they do not have a backup plan, however they are working on a contingency plan in the upcoming

resource consents. He also mentioned that the biggest mistake of the scheme was that when the Wairarapa Catchment Board originally established it, they focused on maximizing farming. They built stopbanks too close to the river and now, due to erosion, they may collapse into the river. This would lead to unprotected land and further alterations to the entire scheme.

Following this presentation, our team presented a final project proposal which led to an exchange of valuable information and discussions about our project's direction. We met Ra Smith, who introduced us to Māori culture. He provided valuable feedback for interview questions and clarified how the Māori interact with people. Ra revealed that the Ruamahanga River cutoff symbolizes a disconnection between the Māori and the environment. The health of the water body, or lack thereof, reflects the poor health of the community.

David, Ra, and Ian Gunn, our sponsor told us to not hide anything from the stakeholders, to be honest, and to send our reports back to the people we interviewed. It was evident from this meeting that communication in the Wairarapa region would be the focus of our project.

4.1.2 Initial Exposure to Māori Culture

The Greater Wellington Regional Council further exposed our team to Māori culture by setting up a meeting with a local iwi member who talked about the history of the iwi in the Wellington region. Additionally, Ra Smith arranged for us to attend a Marae at *Kohunui*, or “Big Fog,” (Figure 27) located near Lake Wairarapa, on January 27th. The entire experience was extremely rewarding. We gained a better understanding of Māori tradition, interaction, and overall culture through a welcoming ceremony, hongi (handshake), mihi (introduction), and history discussion. The conversations and observations are valuable to this project because we saw the raw emotions and dynamics of a group of individuals, who may not share their thoughts at the same intensity level during a personal interview.



Figure 27 - Kohunui "Big Fog" Marae located near Lake Wairarapa

Most importantly, members of the hapu at Kohunui discussed their current involvement with Wairarapa Moana. They still use the lake for catching *tuna* or eels, and diving for shellfish. They discussed the current treaty claim and provided up to date information. We learned it is likely that the Crown may gift the bed of the lake back to the Māori. This is important because if the local iwi gain management responsibilities of the lake, then it will impact the details of the barrage gate resource consent in 2019. Appendix D contains the notes from that participant observation.

4.1.3 Visit to Lake Wairarapa

On Monday, January 18th, we performed a participant observation of Lake Wairarapa. We visited many different points around the lake and the scheme itself to further understand the importance and complexity of the scheme and its effect on the land around Wairarapa Moana. Figure 28 is a photo of the barrage gates.

We were fortunate to have Ra accompany us and offer the Māori perspective on many aspects of the Lower Wairarapa Valley Development Scheme. One of the key aspects he mentioned was the desire to have fewer obstructive concrete structures to improve fish passage.

Ra understood that the farmers need the lake levels at a certain height, but wondered if there was perhaps a way to control the water that would additionally restore wetlands and improve fish passage.



Figure 28 - Blundell Barrage Gates when they're closed

As previously mentioned, the Ruamahanga River cutoff (Figure 29) is a significant symbol of disconnection between the Māori and Pakeha culture. The Māori view the rivers and streams as the veins of *Papatūānuku*, or Mother Earth. Due to its previous connection to both the Sea, and the lake, the cutoff's current state is a reflection and a reminder of how the Lower Wairarapa Valley Development Scheme changed the land and represents a blockage in the veins. The prevention of flow in your body causes sickness and the lack of flow in the water system reflects that the community is not in good health. The water is exceptionally stagnant, only moving during rainfalls and when the barefoot water skiers practice there. People around the cutoff often complain about the odor, and the bright green color of the water.



Figure 29 - Ruamahanga River Cutoff

4.1.4 Interview with David Boone

We interviewed David Boone, flood protection department, to better understand the region and sharpen our project goals. The goal of this interview was to gather information about the Lower Wairarapa Valley Development Scheme regarding the operation of the barrage gates, Māori interactions, the structure of the government in the region, and the economics.

David explained that there are ten total river schemes that cover thirty water courses and fourteen drainage schemes in the region. The Lower Wairarapa Valley Development Scheme is the largest scheme in the region and alone is the size of all the other schemes combined. He mentioned that, like the LWVDS, there are other river schemes that need resource consents while there are also rivers in New Zealand that do not involve resource consent. The Resource Management Act outlines which activities need resource consents and which do not.

When asked about Māori involvement, David Boone described it as a “grey area.” He said that in principle the GWRC and the Māori co-manage Wairarapa Moana, however in practice it is very difficult because the iwis do not have sufficient funds. David explained the organization of the region’s government; there are three local councils and six regional councils. The local councils deal with civil matter while the regional council deals with environmental matters.

Lastly, David noted that flood protection provides between seven and thirty million dollars in annual benefit determined by the Sapere economic report of the scheme. The GWRC budgets for the maintenance of the barrage gates. David explained that the landowners pay fifty percent of the maintenance budget through rates based on the level of benefit they receive from the scheme. All this information provided a better understanding of the region and served as a useful backdrop for a variety of responses during our interviews. David explained that our project should yield common trends and disagreements that are evident during discussions with the stakeholders. Any new information or “surprises” would be the most helpful to the flood protection department.

4.1.5 Wairarapa Moana Coordinating Committee

On January 20th, we attended the Wairarapa Moana Coordinating Committee, which demonstrated how the different organizations interact with one another. We witnessed an intense conflict of interest between many of the interested parties. The farmers were particularly upset about how the public perceived the water quality in the region. The local paper posted an article that defamed the farmers and blamed them for the state of the water quality. A few of the farmers, who were upset with way the community views the water quality issue, resigned from the committee that day. They stated that no one ever listens, and that the committee never accomplishes anything. This event highlighted the lack of communication among groups and how even though stakeholders were exchanging words and ideas, policy and lack of compromise prevented those ideas from coming to fruition.

4.1.6 Challenges

During the initial stages of research, it was difficult to find much information regarding the treaty claim submitted by the Rangitāne. In order to research that piece of legislation

thoroughly, we planned on interviewing the Office of Treaty Settlements upon arrival. However, once we initiated contact with the organization, the Office of Treaty Settlements indicated that the information regarding the Rangitāne treaty claim is classified. While we were unable to ask any questions about this specific claim, they told us we could inquire about the general process. Initially, we considered conducting an email interview, but realized that without specific information regarding how the current treaty claim could affect the outcome of the management of the lake, general information about treaty settlements would not be useful for our specific project.

4.2 Interviews

The team conducted interviews with twenty-nine individuals in total, four from Rangitāne o Wairarapa, seven from the Department of Conservation, six from the South Wairarapa District Council, eight landowners around the lake and four recreational water users. Table 4 lists the twenty-nine stakeholder interviewees. In our report we anonymized interviewee names, using ‘Interviewee A’ to ‘Interviewee AC’, to protect their viewpoints and identity. Figure 30 depicts the locations of the twenty-nine interviewees in the Wairarapa region. While conducting interviews, the project team made sure to actively listen in order to identify unique answers that might otherwise slip through the cracks of a quantitative analysis of the data. Consequently, the team was able to highlight important responses and identify the most important issues for each stakeholder group. Our group transcribed each interview and all transcriptions are located in Appendix E.

Table 4 - Interviewee List

Rangitāne o Wairarapa (4)	Interviewee	Interviewee Location
	Russell Kawana	Masterton
	Mike Kawana	Masterton
	Joseph Potangaroa	Masterton
	Horipo Rimene	Masterton
Department of Conservation (7)		
	Anna Burrows	Masterton
	Garry Foster	Masterton
	Joe Hansen	Masterton
	Daniel Kawana	Masterton
	Chris Lester	Wellington
	Hugh Robertson	Wellington
	Tony Silbery	Masterton
South Wairarapa District Council (6)		
	Murray Buchanan	Martinborough
	Mark Ellingham	Martinborough
	Russell Hooper	Martinborough
	Brian Jephson	Martinborough
	Colin Olds	Martinborough
	Adrienne Staples	Martinborough
Landowners (8)		
	Ted Colton	Near Cutoff
	Neville Davies	Near Cutoff
	Fraser Donald	Near Cutoff
	Noel Gray	Near Barrage
	Ann Gray	Near Barrage
	Ed Handyside	Near Barrage
	Robin McConachy	Near Barrage
	Mike McGreary	Near Barrage
Recreational Water Users (4)		
	Paora Amundsen	Greytown
	Ian Bill	Poirirua
	Bevan Kelly	Wellington
	Ross Linten	Greytown

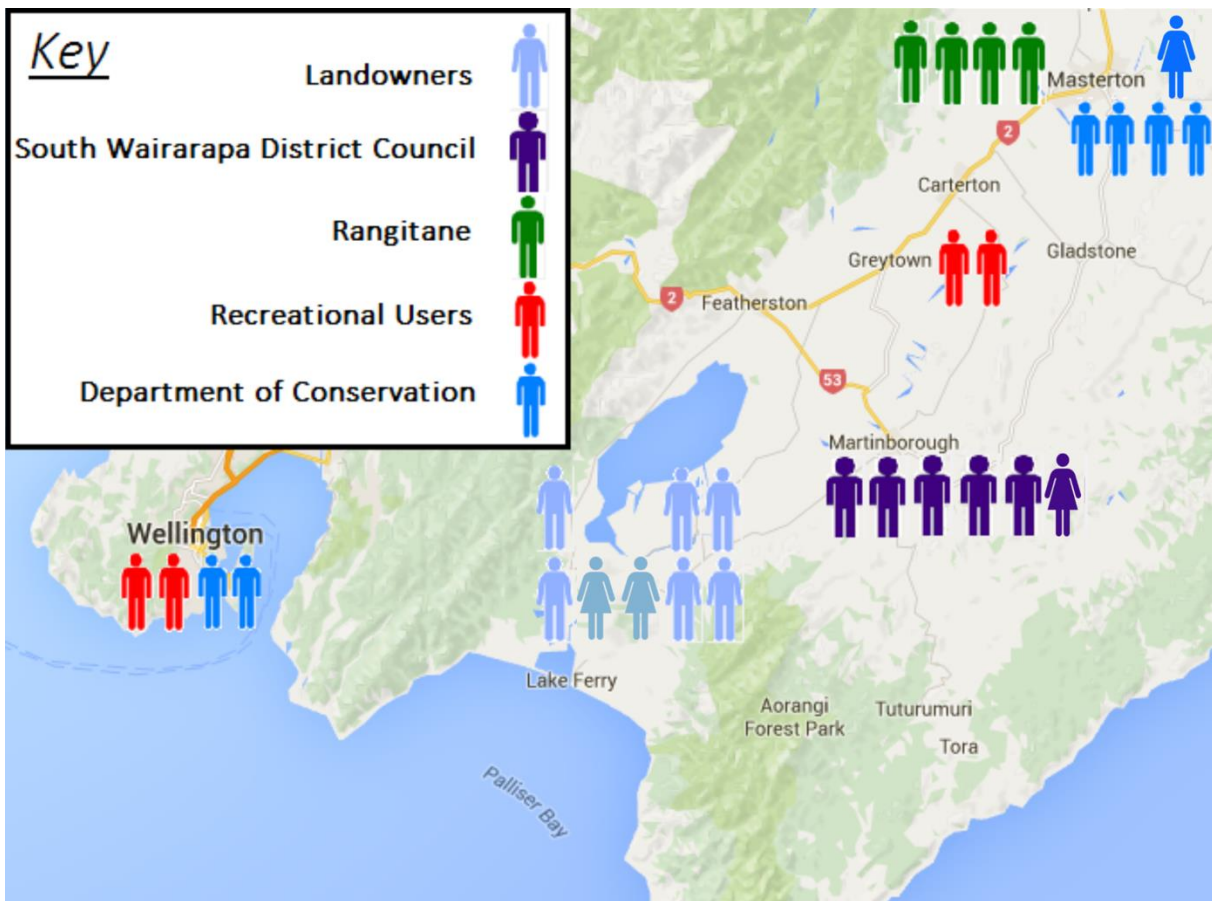


Figure 30 - Map of Wairarapa region that indicates where our interviewees are relatively from.

4.2.1 Rangitāne o Wairarapa Interviews

Our project team understood going into the interviews with the Rangitāne that their answers would be longer and more holistic, encompassing everything culturally important to them as well as many other aspects of the issues at hand. We met four with iwi members to discuss the implications of the barrage gate operation. Their perceptions and needs of the current situation around the lake were all very similar.

The most important issue to the Rangitāne regarding flood management in the Wairarapa Region was the lack of a natural system. The barrage gates and the Ruamahanga diversion prevent many natural processes from occurring by restricting the flow of water and preventing regular flooding cycles. The blockages in the water have cultural significance with the Rangitāne as Interviewee A highlighted during their interview, “you know [when] you have a blockage in a vein or something that doesn’t get flushed out? We get sick... The veins of Papatūānuku (mother

earth) are the rivers.” When asked about the resource consent renewal, Interviewee B stated that “The only thing I would like to see is to get that lake moving, get that water moving.” Methods to achieve this include leaving the barrage gates open for longer periods of time, reinstating flow into the Ruamahanga Cutoff, leaving the Onoke Spit closed longer and most dramatically, removing the barrage gates and cutoff altogether.

The Rangitāne interviews also yielded many other recommendations. A huge concern for them was the impact of the barrage gates on the fish. The gates impede the movement of diadromous species such as the eel. In the past, the longfin eel was a staple food source for the Rangitāne. However, since the implementation of the flood prevention scheme they’ve noticed a decline in the longfin eel. To mitigate the negative effects of the scheme, Interviewee A would like to see either better fish passage technology or better timing when the regional council opens the gates for the fish.

Poor water quality and pollution from human influence raised concerns for many of the Rangitāne. “I can’t blame the farmers only,” Interviewee C pointed out as he explained that wineries and local communities also contribute to the pollution problem. However, he recommended that farmers exclude stock entirely from the lake. Interviewee B added that he would never drink the water. Interviewee A noticed that debris in the water clutters around the barrage gates. Fixing this garbage problem was one that Interviewee A considered a priority.

One recurring theme our project team identified during interviews with the Rangitāne was their desire for more collaboration with the GWRC. The pending treaty process could result in the Rangitāne gaining ownership of the bed of the lake. This would give them more management responsibilities, which they find desirable. They felt that in the past, they were not included in management decisions regarding the lake. Interviewee D stressed that the iwi wanted to cooperate with the GWRC as they move forward with the process of changing the management plan of the lake. As the regional council plans for the resource consent in 2019, it is vital to the iwi that the GWRC considers their needs. Ultimately, the removal of the barrage gates would meet many of their needs and it is evident that the Rangitāne want to restore Wairarapa Moana to its natural state as it was before the implementation of the flood prevention measures. Any progress in that direction will be more than what they received from the management in the past.

4.2.2 Department of Conservation Interviews

Before speaking with the Department of Conservation, we knew that conversations with them would likely center around the environmental impacts of the flood prevention scheme. Through speaking with them, we heard concerns regarding fish passage, bird nesting, invasive wildlife, vegetation and water quality. We conducted seven interviews with different employees of the Department of Conservation. Each interviewee highlighted a different set of issues regarding the management of the water system because of their specific expertise. However, the ultimate goal of the Department of Conservation is the same. The primary function of DOC's work is to protect the natural process and native wildlife in the region. DOC needs to accomplish this through multiple facets that are all interdependent.

The current flood prevention scheme reduced the scale of flooding. The previous process would hold the lake water levels up for months at a time, effectively killing off all the exotic plant life in the wetland regions and on the lake's edge. Native plant life flourished for this reason. Now, invasive species pose a threat to natives and are a serious concern. DOC is doing intensive weed control in the region to try to mitigate the effects of lower water levels. However, Interviewee J mentioned that leaving the lake at a sustained higher level for longer periods of time might help act as a natural weed control.

The bird life in the region is incredibly unique and heavily dependent upon the vegetation. Exotic plants are becoming prominent in the region, while the natives, like raupo, are being pushed out into deeper water in the wetlands and on the lake edge. This has a negative effect on much of the birdlife. Bitterns, dabchick and multiple wading birds all require a specific environment. Interviewee J explains, "If the lake was too low, the wading birds weren't there and if it was too high, they weren't there... There seemed to be a pretty sweet range and that ended up being pretty much the consented levels for the lake." Any deviation from the current levels would likely be detrimental to the current wading birds. Interviewee K expressed his concern that preventing grazing near the water's edge would leave the vegetation too tall and it would not be suitable for birdlife as it was previously.

This issue needs to be balanced though, because letting stock graze near the water creates problems regarding nitrates and nutrient pollutants in the water that can degrade its quality. When the lake levels are low, stock is allowed to graze in the exposed area, but when the water levels rise, the effluent flushes into the lake water. Interviewee K described this issue; "So having maybe a cost and benefit of having grazing, you have some benefit from keeping the tall

fescue down and the weeds down. But the cost is that you have extra nutrients going into the lake.” It’s an issue that’s ongoing and one that will require a lot of discussion by the management in the future.

DOC is not entirely sure about the issue of fish life. The fish counts north of the barrage gates are not bad, however the fish passage is not very good. Interviewee J explained, “So if the gates aren’t open, that stops them pretty nicely.” Interviewee K even mentioned having a separate system entirely for fish passage. The GWRC needs to protect and focus on native fish because according to multiple interviewees, many other aspects of the environment are currently stable.

4.2.3 South Wairarapa District Council Interviews

The South Wairarapa District Council interviews enabled the project team to gather a variety of opinions from leaders with different roles within the district. We conducted interviews with six individuals. Some interviewees were farmers who held seats on the council and others were exclusively employees of the district council including the mayor, Adrienne Staples. Due to different backgrounds, there were varying opinions regarding the management of the lake. However, the main ideas from their interviews were similar.

The district council’s priority is the tourism and aesthetic appeal of the water body. Every single interviewee noted the importance to the council of attracting tourists to the South Wairarapa Region. “Tourism, to us, is a very important thing,” claimed Interviewee M when discussing what he would like to see in the future for the region. The main appeal to tourism in the region is its rare birdlife and native vegetation. The scale of the water system is also a draw for visitors. Interviewee Q even referred to Wairarapa as the “playground of Wellington,” inferring that Wellington locals occasionally travel to Wairarapa for leisure time. To attract more tourists, the management focus should be to preserve many of the unique ecological features around Wairarapa Moana. The SWDC believes that promoting tourism will have great economic benefits for the region.

The district council is taking a major step in the direction of environmental protection by altering their wastewater discharge methods. A serious concern of the public is the water quality and currently, a number of townships in the council discharge wastewater into rivers and streams that ultimately flow into Wairarapa Moana. Even though many of the councillors believe that the

shallow, muddy nature of the lake causes the poor water quality, the council is reconstructing their wastewater treatment process. Instead of discharging into water, they will discharge to land which filters out nutrients and the ultraviolet light from the sun will kill bacteria. This should decrease the nutrient input to the system and help promote a cleaner image for the tourism aspect that is important to the SWDC.

The district council also fully supports farmers due to the economic benefit they bring to the region. Being an area that relies heavily on primary industry, the district council explained that the GWRC must maintain flood protection for the farmers. Interviewee L notes, “there is a huge economic investment in farms around the lake and regardless of how perfect we want the environment we also have to take cognizance, otherwise we being the country have to be prepared to pay some massive compensation.”

Overall, the interviewees from the council were content with the current scheme and operation of the barrage gates. Promoting the economy through means of tourism and farmers is their bottom line. The only suggested changes for the barrage gates going forward were upgraded technology, specifically to protect them from natural disaster such as earthquakes. They all want what is best for the community in the South Wairarapa Region.

4.2.4 Landowner Interviews

Interviewing landowners around the cutoff included mostly farmers, many of whom rely on Wairarapa Moana for irrigation and rely on the scheme to prevent floods from wiping out their farms. We had a total of eight interviews with landowners located around Lake Wairarapa, five from around the barrage gates and three from around the Ruamahanga Cutoff. The difference in location was evident in their interview responses. Different locations around the lake require different conditions in regards to the scheme’s operation. However, each landowner supported the same outcome.

Primary industry is the huge economic driver in the lower Wairarapa. All of the landowners recognize that without the development scheme, their lands would not be protected from floods and would be highly unproductive. Interviewee V claimed, “We always grizzle and groan about how much we have to pay, but if the existing stopbanks weren’t maintained we would be grizzling a lot more if we were all underwater.” Protecting the current scheme of stopbanks, cutoff and barrage gates is a clear priority from the farming community. Many of

them expressed that they were nervous about the resource consent because something could change and a change could negatively affect them.

Many landowners seemed frustrated about the public perception of the water quality. There is a stigma in the region that the agriculture industry is the cause of a rapidly degrading water quality in Wairarapa Moana. Local media portrays the farmers as the primary source of poor water quality. While many landowner interviewees recognize that farms may play a role in the high nutrient level in the water system, they believe that the water quality is not actually as poor as the public perceives it. Lake Wairarapa is a shallow lake, so it naturally silts up easily. Many landowners believe that the quality is not getting worse. As farmers, they are taking steps to reduce their impact on the system by planting native vegetation near the water to develop riparian zones and excluding their stock from grazing in the water; stock in the water seem to be the most popular scapegoat for poor water quality. Interviewee S explained, “To me it’s more than just farmers that are creating the problems, but other than that I believe that the farmers are taking it aboard and are doing a lot about it.”

Although the landowners benefit from the scheme, they feel that their relationship with the management is not very strong. Interviewee S stated, “you’ve got the people that are farming the land and making the food for the world, a small group, and the people that are having the bigger say are in the cities that don’t always realize what is required to actually... get the food.” This suggests that there needs to be more communication between the landowners and the lake management in future years.

The funding plan for the scheme maintenance was a controversial topic as well, since each landowner pays different rates to the GWRC. Interviewee Y explained how one of the factors the GWRC uses to determine the rates is their proximity to the lake. Proximity to the lake is related to the level of benefit they receive from flood protection. Overall, the approximate benefit a landowner receives is the measure that the GWRC uses to determine an appropriate rate for that individual. Some landowners feel as if the GWRC unfairly charges people higher rates based on where they live.

Each individual farmer has a different set of needs regarding barrage gate logistics because of the level of each farm compared to the water. Higher water levels in the summer (to aid irrigation) and lower water levels in the winter (during high flood risks) were common themes during these interviews. However, there were differing opinions amongst them. For

example, during times when the Onoke spit is blocked, farmers located near the cutoff do not want the gates open because that allows saline water from Lake Onoke to enter their irrigation systems, ultimately killing their pasture. However, farmers located further away from the barrage gates want higher water levels in the summer. They want the gates open because the salinity won't affect them. Overall, protecting the current system is their priority for the upcoming resource consent. Anything that prevents the flood protection from working could make their farmland unusable.

4.2.5 Recreational User Interviews

Barefoot water skiers are key recreational water users of the Wairarapa water system, specifically the Ruamahanga Cutoff. The barefoot water skiers club that uses the cutoff is typically only for very serious, competitive skiers. In fact, a number of world champion and national champion barefoot water skiers have trained on that strip of water, including one of our interviewees. We spoke to three members of the barefoot water skiers club and longtime users of the Ruamahanga Cutoff. The cutoff is an ideal location for them to ski because of its exclusivity and calm waters. They started using the cutoff in the 1970s and it is really the only body of water in the region suitable for serious training for their sport. The water skiers had very little opinion about the lake itself and were primarily concerned with the dynamics of the area in which they trained.

Their primary concern was the estuary that often separates the cutoff from the main body of water. The estuary (Figure 31) prevents the water levels in the cutoff from fluctuating as much as the lake levels. This routinely holds the cutoff at a higher level than Lake Wairarapa. This allows the skiers to continue using the cutoff during the summer when lake levels are typically low. Interviewee AB explained, “so if something was going to happen, we’d like the estuary to stay there. I don’t know how the farmers feel about that...” All three interviewees explained that if something were to happen to the estuary, they would no longer be able to use the cutoff for training. They could potentially tolerate up to half a meter lower than the water level currently is, but any lower would render the waterway completely unsafe for skiing.

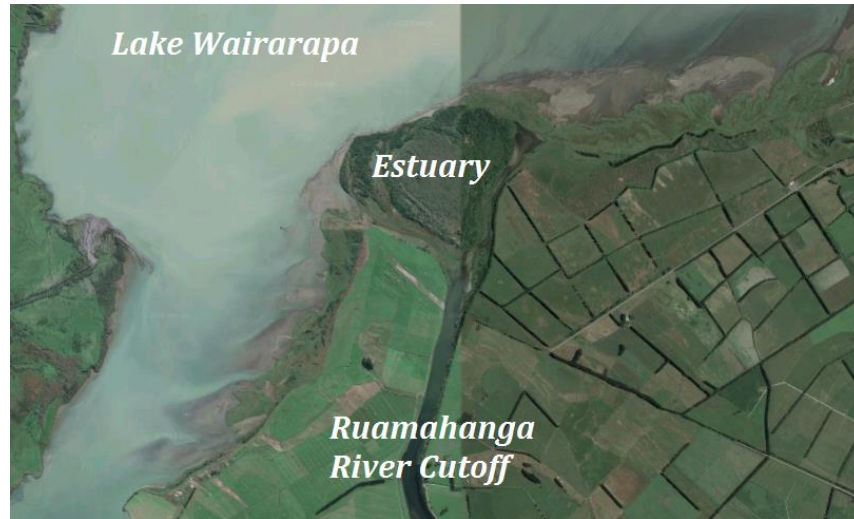


Figure 31 - Estuary that separates Ruamahanga Cutoff from Lake Wairarapa (Google, 2016)

Additionally, the water skiers expressed interest in the water quality in the cutoff. They explained that “nobody has ever gotten sick,” however, they claim that improving water quality is a benefit for both them and the farmers who use the water for stock. The current conditions in the cutoff are poor; there is a seasonal algal bloom that occurs every summer, leaving the entire cutoff a thick, green color as shown in Figure 32. While they do not want to remove the estuary, fresh water from the lake would help improve the water quality in the cutoff. For this reason, they support slightly higher water levels in the lake resulting in more flushing of the cutoff.



Figure 32 - Ruamahanga cutoff vegetation and ski jump

The water skiers also mentioned that more vegetation planted on the northern side of the cutoff would provide a more secluded environment for training. It would shelter them from wind and keep conditions calmer. Without the current conditions of the cutoff, Interviewee AA, a world champion, claims that the region would not produce the numerous world champions and national champions that it did in the past.

An important thing to note about the barefoot water skiers is that they are currently the only group to actively use the cutoff. The frequent boat traffic from the club may be keeping the cutoff from being completely unusable. The skiers, the landowners and some DOC representatives all explained how the water skiers have a very positive impact on the cutoff. They produce movement in the water and prevent it from being entirely stagnant. In fact one landowner said, “without them, we would not be using that water for stock.” In order for the water skiers to keep using the water body, the state of the estuary needs consideration in the recommendations for the resource consent and the opinion of these skiers should be part of the decision process.

Our project team also spoke to a representative of Greytown Sport, Interviewee Z. He also has strong affiliations to the Māori iwi, Ngati Kuhungunu. We interviewed him to inquire about sporting uses of the lakes and rivers and he related much of that to his Māori experiences. Interviewee Z explained that Greytown Sport is currently discussing future partnership with the Powerboating Club located at the Ruamahanga Diversion.

Due to his connections to both groups, we decided to ask him how the lake pertained to both. “I guess wearing my recreation hat, the ability to create lakes and ponds is a positive for the recreational water users or the recreational water users that I look after. Certainly a flat bed of water is good for water skiing and canoeing and those sorts of things.” Interviewee Z explained that the the Wairarapa Powerboating Club and Kahungunu ki Wairarapa are currently trying to reinstate waka ama rowing on the diversion as a sport. The interviewee supports this because of his sporting and Māori affiliations, but says that in order to get a good course for this sport, the river would need to be widened at the diversion to allow for six lanes of boats which is typical for competition.

4.3 Analysis

The completion of the interviews yielded a variety of results that cannot be accurately discussed strictly within stakeholder groups. Therefore, the following section of this paper explores and compares the thoughts and opinions of the stakeholders on key topics, related to the Blundell Barrage Gates. We asked each interviewee a series of questions, which resulted in a range of answers. The section contains topics that reflect the most common responses found during analysis of the transcription data. These topics include water quality perceptions, sources of pollution, flood management, future operation of the scheme and water levels. Of the analyzed responses from these topics, an average of 38.5% of the interviewees did not mention their opinion on the topic or did not know enough information about the subject to make a comment. We included all of these responses under the “No Comment/ No Opinion” response type on the following graphs. For Ramsar, a high of 58.6% of the respondents fell under the “No Comment” response type.

4.3.1 Barrage Gate Operation

The operation of the barrage gates has several effects on the region. Figure 33 shows the topics that we determined by coding that identify what interviewees felt the barrage gates impacted most. Appendix F.1 also depicts this information by topic instead of by stakeholder in order to provide a different perspective. For water levels and fish passage, there was a significant dissenting opinion and those topics are broken down in graphs further down in the analysis. Twenty-three out of the twenty-nine respondents talked about water levels, making it the most discussed topic. This included any change the interviewee indicated they wanted to see in the water levels. Eighteen of the respondents indicated that they desired some alteration in the flow of water in Wairarapa Moana. The fish passage and technology topics were not as popular as only eleven and four interviewees commented on each topic respectively. Responses involved improving the already existing technology available for the barrage gates.

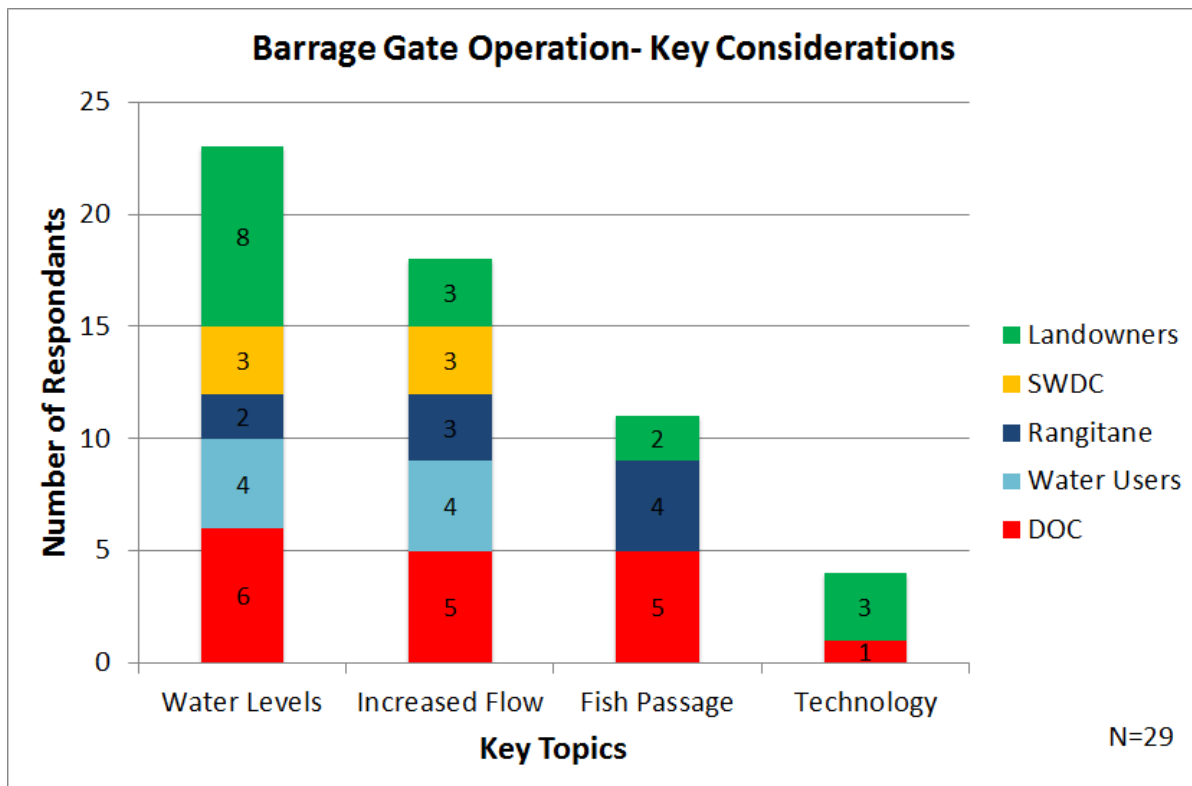


Figure 33 - Barrage Gate Operation - Key Considerations

4.3.2 Water Levels

The variety of responses related to water levels reflects how each interviewee thought the levels should change. However, these answers were not mutually exclusive. Figure 34 illustrates that an interviewee could indicate more than one priority with setting water levels, and therefore the total number of responses does not equal the total number of people involved. For a different perspective, Appendix F.2 organizes this information by topic. The answers were not as simple as lowering or raising the lake levels. Many of the responses had conditions and specific goals that they wished to communicate to the GWRC. Fifteen of the twenty-nine respondents, representing all different stakeholder groups, wanted the GWRC to pay attention to flood protection. Those who supported flood protection, wanted to maintain levels that were opposite to the levels of the natural cycle. Maintaining higher water levels in the summer supports irrigation and sustaining lower levels in the winter serves as a greater buffer against potential flooding. The landowners who are farmers are in support of this idea because it provides security in regards to their assets. Those in support of natural flow, want the lake water levels to return to

a more natural cycle of high levels in the winter and lower water levels in the summer. The Rangitāne are in support of this notion as it better resembles the way the land was before the GWRC implemented the Lower Wairarapa Valley Development Scheme.

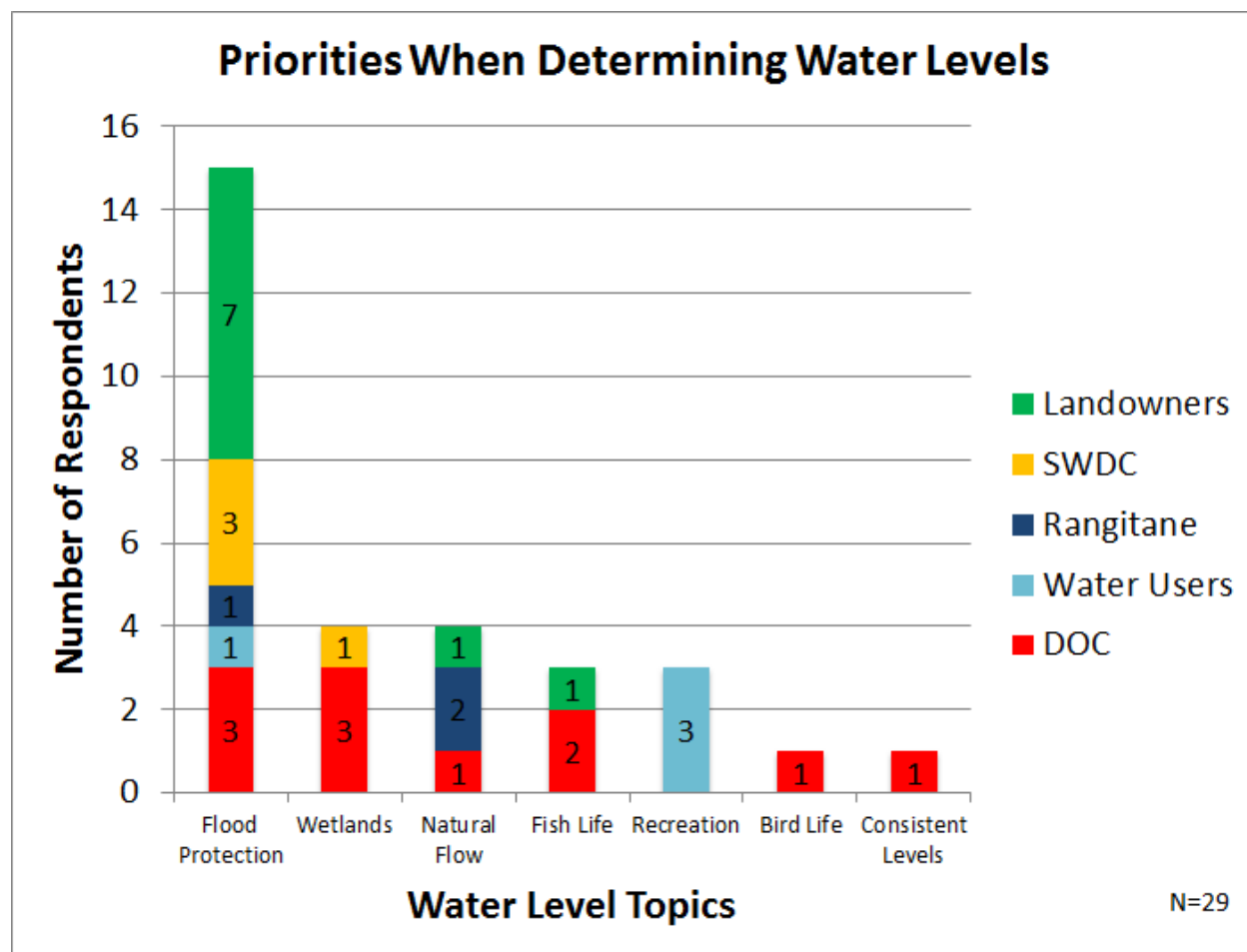


Figure 34 - Priorities When Determining Water Levels

Other stakeholders have interests in maintaining water levels to protect the bird life, the fish life and the wetlands. Currently, the water levels are set at target levels that are acceptable for bird life around the lake and farming. However, due to the dynamic nature of the system, the GWRC cannot always maintain levels within the target range. Many of the interviewees complained that the GWRC keeps the lake levels “a little bit higher than ideal- hard to manage exact levels because of rainfall. Would like to see water levels return quicker to target levels.” (Interviewee K). Many people believe the GWRC should do more research with regard to the

effects of the flood levels on wildlife and wetlands in order to find a compromise that works for people.

Recreational boaters can only utilize the water bodies if there is enough water to support their activities, therefore those in support of water levels for recreation would generally be in support of higher water levels. Consistent water level supporters want less variation between high and low levels. When water levels are too low, the wind blows away exposed sand on the lake bottom, causing lake bed erosion.

There is a lack of knowledge amongst the general public about specific management operations and solutions. Generally, individuals have an idea of the final outcome they would like, but not necessarily an idea of the means to achieve that goal. Some interviewees even altered their responses as they answered the question, which suggests a lack of intricate knowledge. Instead, they would rather communicate their interests and allow the GWRC to perform the research and make the final decisions.

4.3.3 Water Flow and the Ruamahanga Cutoff

Overall, seventeen interviewees were in favor of introducing some type of water flow into Wairarapa Moana in order to improve water quality. There were suggestions to pipe water through the Ruamahanga Cutoff and to dredge and open the estuary connecting the cutoff to the lake. This would introduce a stream of current into the cutoff as well as the body of the lake. The barrage gates also have an effect on the water flow in the lake. An interviewee from DOC mentioned how leaving the gates open for longer periods of time would also help promote the flushing of water from the Ruamahanga River.

Currently, one landowner explained that he obtained a resource consent through the GWRC to create the opening in the estuary barrier between the cutoff and the lake. However, there is a conflict with another stakeholder. Elimination of the estuary would likely cause the water levels in the cutoff to fluctuate more, dropping when the lake does. This would effectively prevent the barefoot water skiers from continuing to use the cutoff as a training area. The cutoff is one of the only bodies of water in the region that they can practice on, and many people who train there are world or national champions, which brings notoriety to the region.

Multiple DOC employees and landowners, including the landowner digging out the estuary, claim that the barefoot water skiers have a positive impact on the cutoff. Frequent boat

traffic stirs up the normally stagnant water which keeps the ecology in the cutoff healthier according to Interviewee J. They create movement of water in the otherwise stagnant channel, which increases water quality and provides a better habitat for the plants and animals living there. If the estuary was removed, it would open the cutoff to the rest of the lake and increase flushing within the cutoff, which would likely help the water quality. Although the flushing effect would be positive, it is unknown how much opening the estuary would change the quality of water since the water skiers would not be able to use the cutoff anymore and the water body would lose the current benefit the water skiers provide.

We also noticed that the barefoot water skiers were unaware of the landowner's plan to dredge the estuary. It was also unclear whether or not the landowner knew the implications this would have on the water skiers. We intend to bring this information forward to both parties involved in order to aid a resolution to a conflict that would result in one of this project's stakeholders to have to entirely leave the region for training purposes.

4.3.4 Fish Passage

There is much debate over whether the fish passage that currently exists within the barrage gates is sufficient to meet the needs of the unique native fish that inhabit the region. Figure 35 displays the majority of the respondents did not comment on the fish passage when asked about the fish, however the majority of the people who did comment thought that the system needed improvements. The DOC and the Rangitāne in particular felt like the gates were not adequate. Interviewee K said that “there's problems when the whitebait migrate they tend to follow the banks and they tend to follow at a certain height below the surface and of course the water levels are always fluctuating so you are depending on one little slot, one little gate in order to allow fish passage. That's pretty hit and miss.” In addition, the Rangitāne feel that the gates negatively impact the *tuna* or eel populations, and prevent them from traveling further upstream. Interviewee K made suggestions regarding a separate system for the fish passage, and installing a camera to monitor the effectiveness. Interviewee H suggested looking into performing further research and understanding the science behind the fish migration and then altering the gates accordingly. The other stakeholders did not have a strong opinion on the matter, and that is likely due to a lack of sufficient public knowledge regarding the state of the fish populations. Interviewees mentioned the exotic fish in the region and the effect they have on the native fish

populations. However, they often failed to mention what affect they thought the gates played in fish life.

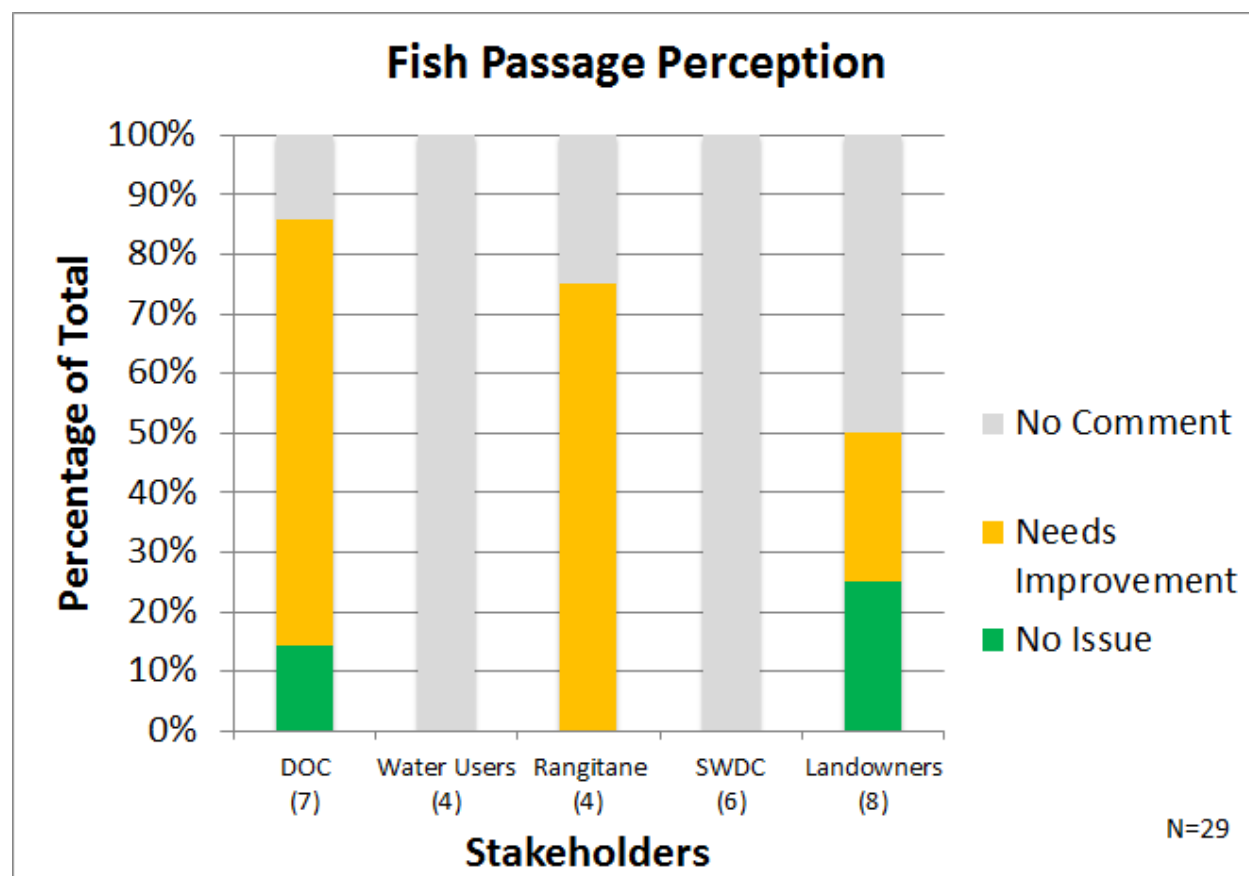


Figure 35 - Fish Passage Perception

4.3.5 Technology

Technology was a theme amongst a few interviewees who wanted to ensure that the GWRC conducts thorough research before making decisions regarding the barrage gates. The request from the community for more technology also reflects the desire to have a completely automated system in order to eliminate human error.

4.3.6 Water Quality

During the interviews, the interviewees responded with varying opinions on the current state of the water quality in Lake Wairarapa. Figure 36 depicts the different perceptions as either positive, neutral, negative or no comment, within each stakeholder group. Positive responses

considered the lake water to be improving or of good quality and negative responses included those that viewed the lake as having polluted, poor water quality. It is important to note that the neutral category accounts for responses that considered the water to be muddy because of the natural, shallow state of the lake. Lastly, “no comment” accounted for the interviewee responses that did not address the state of the water quality.

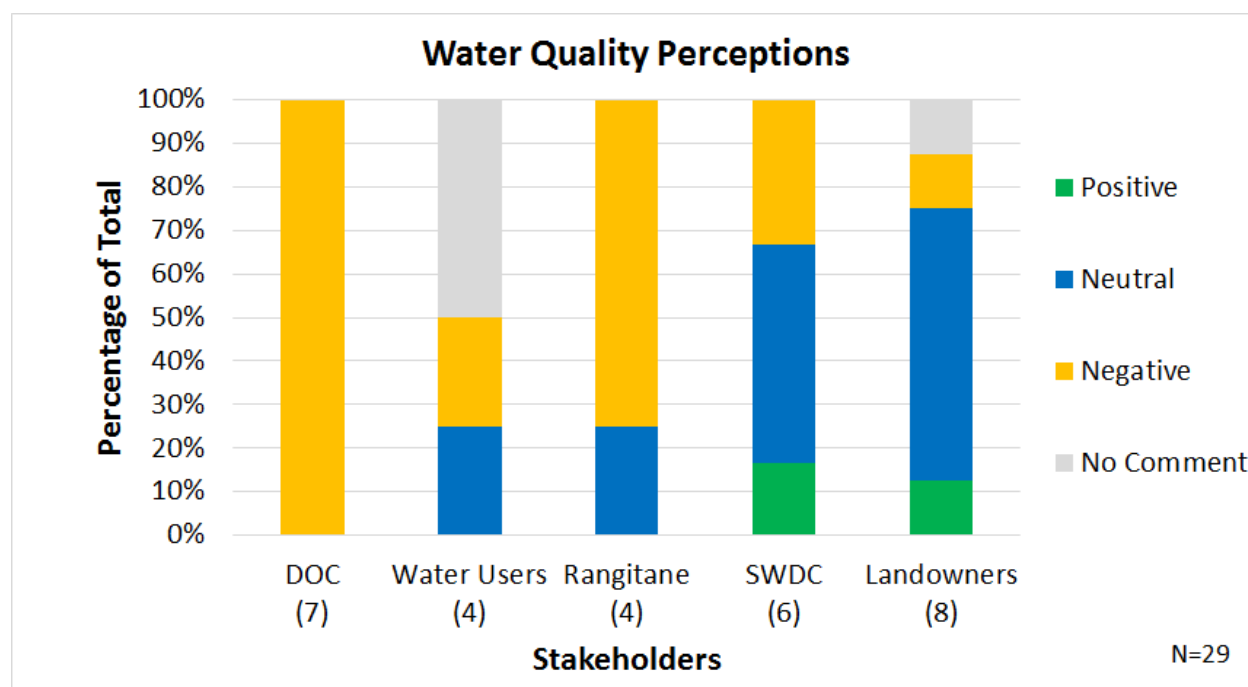


Figure 36 - Water Quality Perception

Overall, the stakeholder responses were split, except for the Department of Conservation, all of whom believed that the water quality was poor in Lake Wairarapa. Seventy-five percent of the Rangitāne believed that the water quality was poor. Of the water users who commented on water quality, half viewed water quality in a negative way while the other half’s views were neutral. There is a difference in perception of the lake between DOC and SWDC in addition to the landowners. The SWDC and the landowners had the wide range of answers unlike the Department of Conservation who all agreed that the water quality was poor. Thirty-three percent of the SWDC viewed water quality as negative, fifty percent viewed it as neutral, and 16.7 percent viewed it as positive. Of the landowners, 12.5 percent believed the water quality was positive, 62.5 percent viewed it as neutral, 12.5 percent believed it was negative and 12.5 percent

did not comment. DOC interviewees responded similarly to the Rangitāne while the SWDC responded similarly to the landowners.

In addition, the responses conveyed that there were many different factors that affected water quality and reflected the community's awareness of these issues. The causes related to nutrient levels, reduced water flow, the muddy, shallow nature of the lake, wastewater and stormwater runoff from nearby towns, lack of saltwater backflow, farming practices, and sediment build up. Figure 37 provides the number of respondents from each stakeholder group that viewed whether the corresponding factors that affect water quality are an issue. Appendix F.3 provides a different visual on the information by organizing the data by stakeholder instead of by topic.

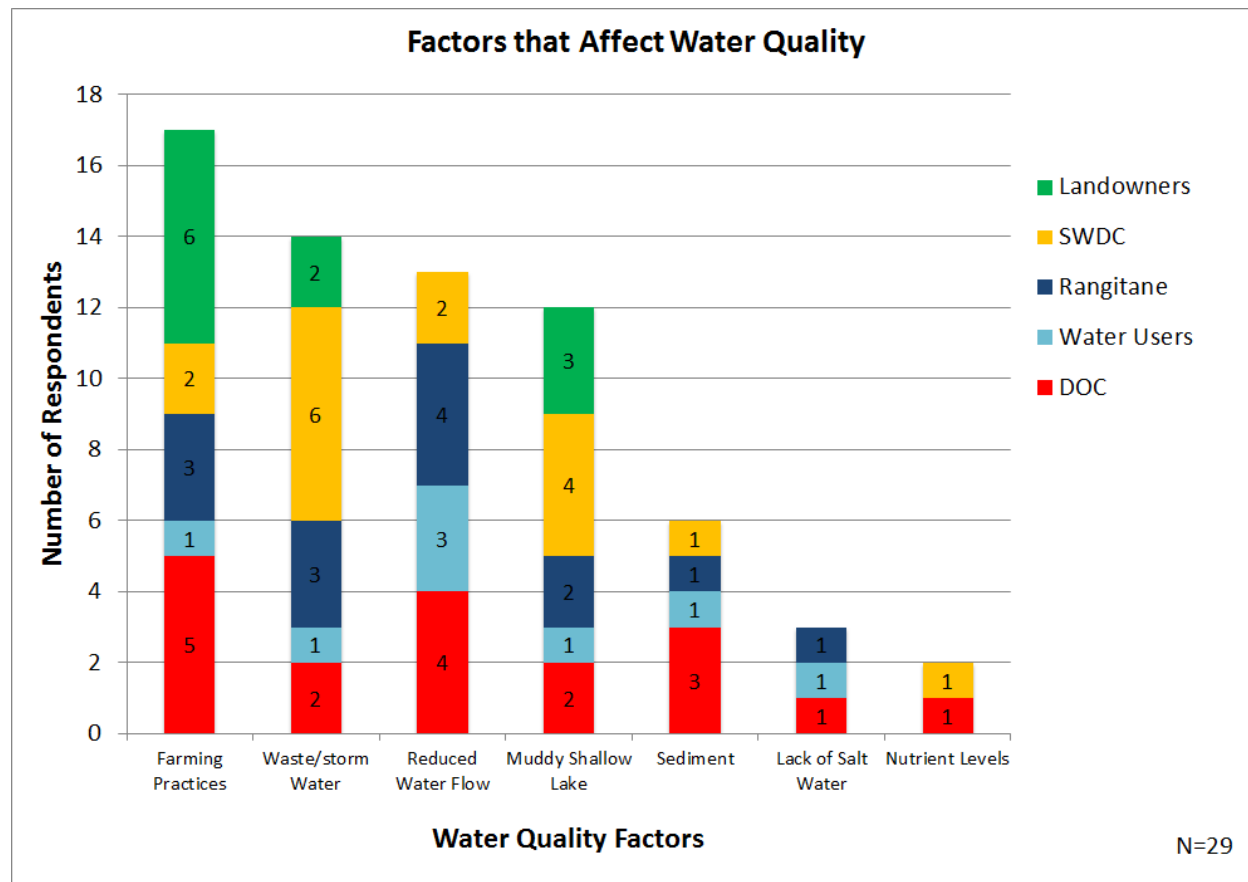


Figure 37 - Factors that Affect Water Quality

In general, the three factors that the stakeholders believed affected water quality the most were farming practices, reduced water flow, and wastewater/stormwater from towns discharging

into the water system. Seventeen out of the twenty-nine interviewees stated that farming practices and wastewater/stormwater runoff contributed to the poor water quality of Lake Wairarapa. Thirteen interviewees mentioned that reducing the flow of the water system degrades water quality, however, no landowner thought that reduced flow was a problem. Eleven interviewees commented that the muddiness and shallowness added to the poor water quality.

Eighteen interviewees believed that reduced water flow, farming practices or wastewater/stormwater contributed to the poor water quality. Of those eighteen interviewees, twelve also said that the water was murky because of the shallowness. Three landowners and four members of the SWDC believed that the shallowness was a large contributor to water quality while all of the Rangitāne believe that the reduced flow was the reason for the poor quality. Water users agreed that reduced flow caused the poor quality, especially in the cutoff. This finding shows that there is a discrepancy in whether the shallowness of the lake, or the activity around it, causes the poor water quality.

Figure 38 depicts the water quality factors mentioned by fifty percent or more of each stakeholder group. This shows what the majority each stakeholder group considers to affect the quality of the water system. Note that not every stakeholder group mentions farming practices. Even though farmers mentioned farming practices as the only factor over 50%, most of the farmers explained that they thought that farming has a minimal impact and is improving. Despite heightened media attention, this chart demonstrates that the community recognizes other factors that impact water quality. It's important to note that we specifically asked each interviewee if farming practices affected the water quality. This could contribute to the large number of responses we received regarding farming practices.

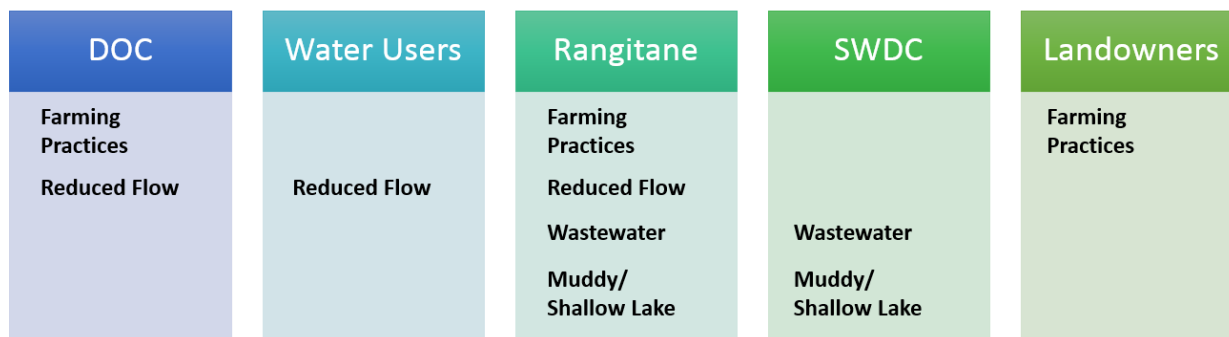


Figure 38 - Factors that affect water quality separated by stakeholder.

4.3.7 Irrigation

Irrigation became a point of conflict during our interviews, specifically between the farmers and the rest of the community. Figure 39 depicts the stakeholder's views on irrigation in the region, and whether or not they want the GWRC to regulate the practice.

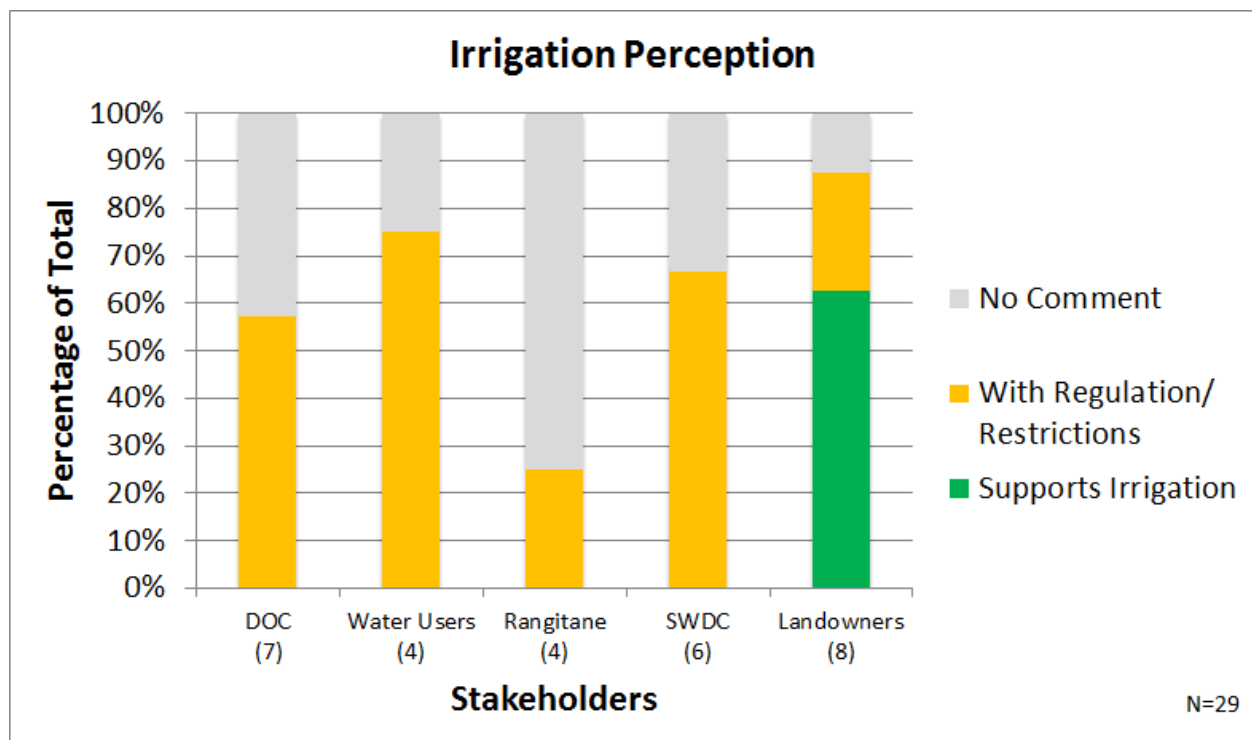


Figure 39 - Irrigation Perception

There were no interviewees that were in opposition to irrigation. Fifteen out of the twenty people who commented in the community support irrigation with regulations. They are worried that the lack of regulations about irrigation practices could affect surface water and they would like to make sure irrigation operates on a reasonable scale. The community understands that irrigation is beneficial for production. Contrarily, the landowners support irrigation and only two mentioned that irrigation needs regulations. Many believe there are already too many regulations around their farming practices in addition to the resource consent, which most feel is a long, expensive process that makes it difficult to get things done. Even though they do not want regulations, they seem to want to use irrigation reasonably. Landowners along with members

from the other stakeholder groups suggested damming in the surrounding hills for water storage.

4.3.8 Wetlands

The interviewees had varying outlooks on the state of the wetlands that surround Lake Wairarapa. Figure 40 illustrates the stakeholder groups' perception levels with respect to the state of the wetlands. We asked each stakeholder, "What is your opinion on the current status of the wetlands?" The responses to our question are categorized into four different groups: good, should be maintained, needs improvement, and no comment.

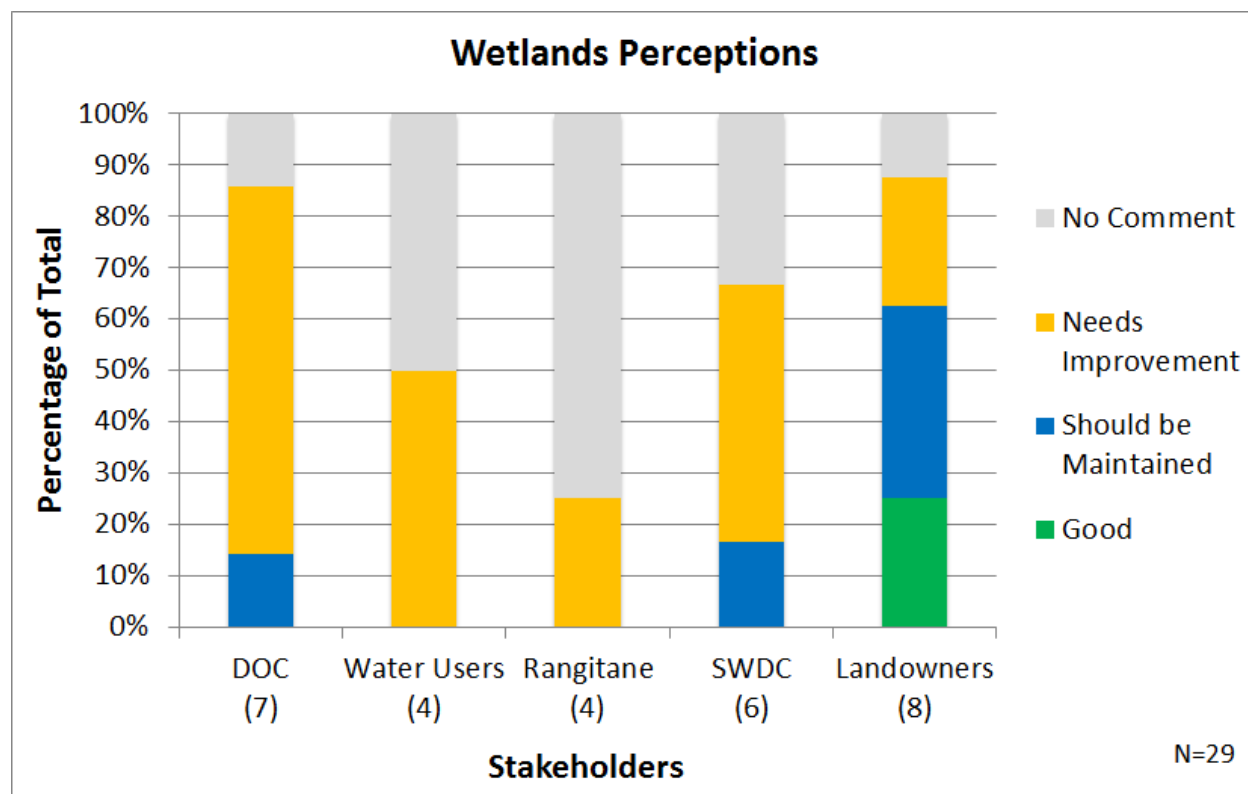


Figure 40 - Wetlands Perceptions

Thirteen out of the twenty interviewees who commented on wetlands said that they need improvement and only the landowners believe that the wetlands are in a good state. Others voiced that there are so little wetlands left that the community needs to maintain them. Interviewee H, from DOC says, "I would like for [the general public] to be able to access [the wetlands] more regularly and to take it to their hearts more and to be more proud of it and

support the conservation and to become more educated about wetlands...” In addition, landowners mentioned that they created their own wetlands in order to trap sediment and nutrients and appreciate wetlands as long as they are in the right places. The Rangitāne feel that landowners converted too much of the wetlands and, as a result, they are in a poor state. As a whole, everyone believes that wetlands are important to water quality, wildlife, and recreation.

Although the community agrees with the importance of wetlands, they do not all agree with applying for Ramsar status. There is essentially a divide between the people who are most interested in the economics of the region over the environmental interests. Figure 41 shows the opinions on Ramsar status.

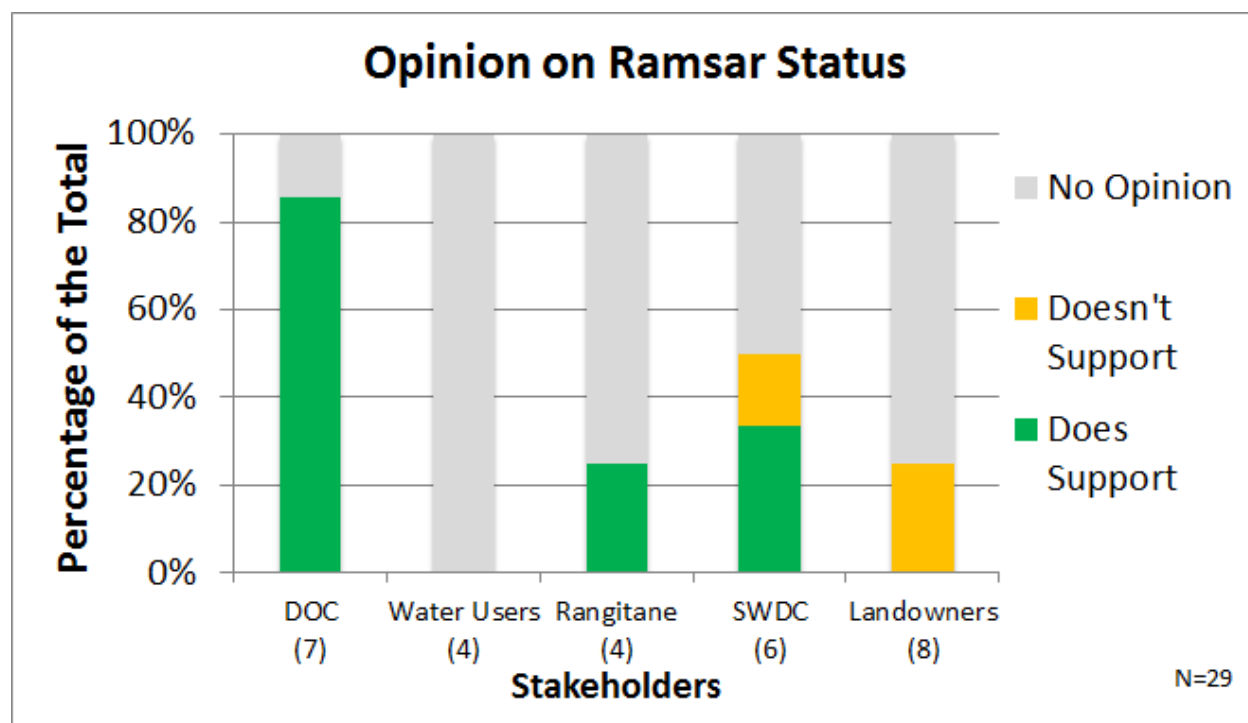


Figure 41 – Opinion on Ramsar Status

All six of the interviewees who knew about Ramsar from the Department of Conservation, one from Rangitāne o Wairarapa, and two from the SWDC support Ramsar and see it as a chance to get funding, resources, recognition, and protection for the wetlands. Interviewee M from the SWDC says, "I'm excited about it, I can't wait for this to happen, and I think it will give recognition to an area that is really significant in New Zealand" while the two

landowners who were familiar with Ramsar did not support it in fear of the government setting more limits on how they run their business.

4.3.9 Management Issues

When asked what each interviewee thought of the management of the barrage gates, and the Lower Wairarapa Valley Development Scheme in regards to flood management, the answers varied between stakeholders. The Department of Conservation (DOC) and landowner group are both split between thinking the scheme is well-managed and not well-managed. Furthermore, 50% of the Rangitāne respondents believed that the scheme was not well-managed compared to the 25% who responded in favor of the current management. Seventy-five percent of the recreational water users group had no comment on the matter, and 67% of the SWDC thought the scheme was well-managed. The majority of the responses came from asking the interviewees, “do you think flooding is well-managed?” Figure 42 summarizes the coded responses taken from the interviews.

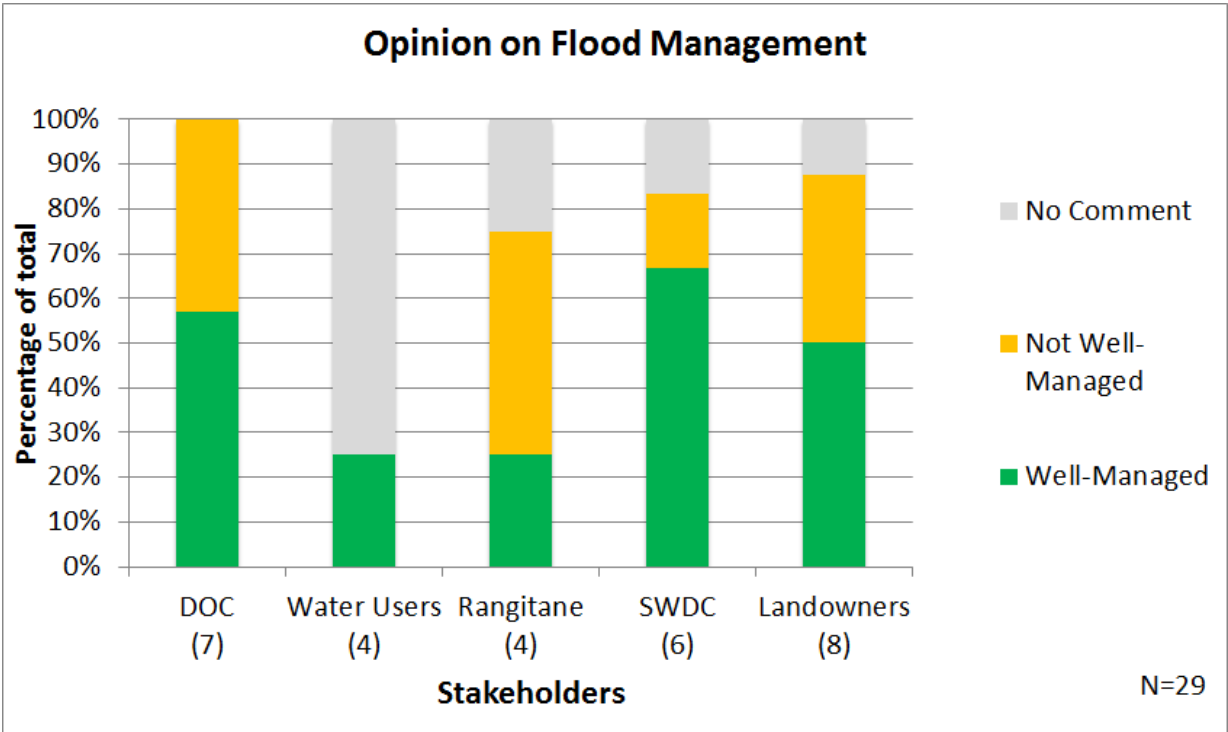


Figure 42 - Opinion on Flood Management

It's clear that more people considered the scheme well-managed than considered it not well-managed. However, it's important to note that there is a split within stakeholders and between them as well. The only conclusive data displayed in this graph is that there are discrepancies between interviewees. For this reason, it was important to analyze the specific suggestions regarding lake management from respondents during their interviews.

During the interviews, a number of interviewees noted issues they currently have with the management of Wairarapa Moana and made suggestions about what the Greater Wellington Regional Council should focus on in the future. Figure 43 depicts the breakdown of suggestions by stakeholder group. Additionally, Appendix F.4 shows this information based on stakeholder instead of management suggestion topics.

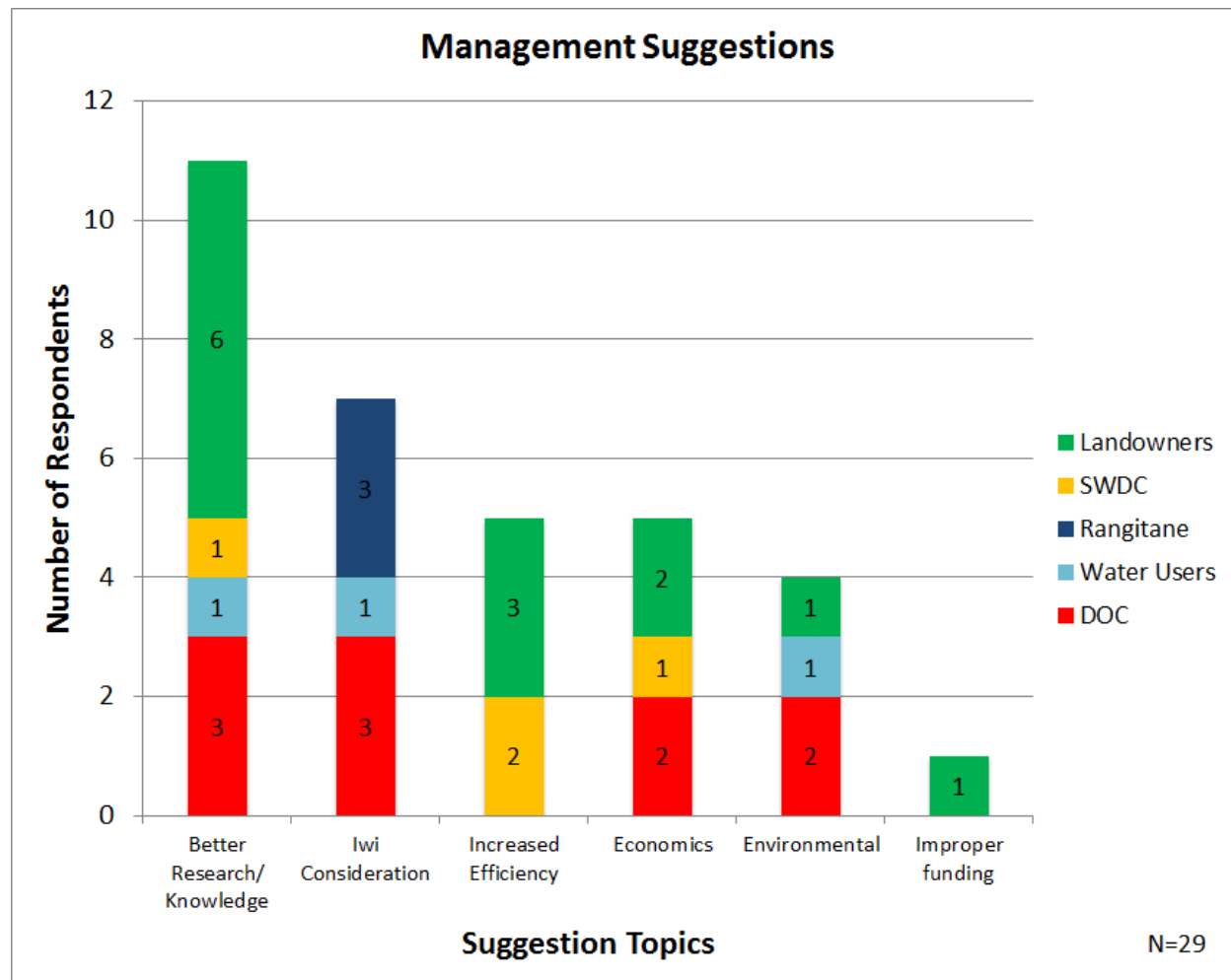


Figure 43 - Management Suggestions

Better research and knowledge was a key topic during discussions with the landowners; they explained how a better scientific understanding of the region would allow the GWRC to more effectively operate the scheme. This seemed to be one of the most common suggestions regarding the management. An interviewee from DOC stressed that the engineers from the regional council need to understand the environmental aspects better and to work alongside the conservationists in the coming years.

The Rangitāne's key issue with the management is the lack of iwi involvement. The iwi consideration topic on the graph reflects the percent of interviewees from each stakeholder group who supported co-management with local Māori. When we asked one Rangitāne what they wanted going forward, they responded, "Ensuring that as they move forward that they take us with them, and not... History tells us that often we're in the back somewhere and often when something goes wrong then we're called upon. We'd rather be there beside them when they move forward, in whatever form that may be." Management responsibilities are a priority for the Rangitāne as they approach the 2019 resource consent application.

A number of people pointed out that the current scheme didn't balance the environmental and economic interests well enough and suggested an increased focus from the GWRC for one or the other going forward. Interviewee T explained, "My personal view when they are considering the application for consent is that they have to consider the financial, social, and environmental impacts of whatever they do... I know I kind of get a little bit concerned that there is a big push for one or the other so those three have really got to be weighed up and really have to find the right mix to get it right because, I'm not sure how long the consent lasts for, but I'm assuming that its ten years or something like that, so it's a long time to live with the wrong decisions." Different parts of the community desire different outcomes with the scheme. It is necessary to find a compromise.

Increased efficiency of the entire management process and resource consent application was brought up in interviews with the South Wairarapa District Council and a number of landowners. One SWDC interviewee stated, "A lot of money [is] spent in the wrong direction... to get consents." The previous resource consent for the barrage gates took six years to approve. Going forward, the Greater Wellington Regional Council should make efforts to make this process more efficient.

Our team also interviewed one landowner who thought the management rate plan for the scheme's maintenance budget needed to be altered because there were others who benefitted from the flood protection scheme, but paid much less in rates. However, other than this person, most other rate-payers found the regional council's funding plan for annual maintenance to be fair.

Three common themes identified through the interviews were communication, collaboration and education. There is a lack of communication between the stakeholders as well as a lack of communication with the regional council. Very few stakeholders had sufficient understanding of what the Greater Wellington Regional Council was actually doing regarding the barrage gate operation. Many of the interviewees are involved politically with the flood prevention scheme and are unaware of management practices. For example, one interviewee noted that it would be helpful if the regional council had an entire team dedicated to managing the scheme. They were unaware that Greater Wellington does, in fact, have a flood protection department. Increased transparency, collaboration and public education about the current activities and policies regarding Wairarapa Moana would help the GWRC solve this communication issue.

Chapter 5 - Conclusions

It was evident at the start of this project that there were communication issues within the community of Wairarapa. The participant observations conveyed that we needed to pay close attention to how the community interacts with one another during our interviews. This stakeholder study proved that there are large-scale problems within the region that led to the strong conflict of opinions. At the heart of these issues is the lack of communication, the lack of collaboration and the lack of education.

At the Wairarapa Moana Coordinating Committee, the two farmer representatives resigned, in part due to inaccurate media representations of farming practices and water quality. Due to this, they seemed frustrated and disappointed in the community's perception of them. We were under the impression that the rest of the community would single out the farmers in the same way as the media had. Surprisingly, our results showed that the community is aware of other forms of pollution such as reduced water flow, the muddy and shallow nature of the lake, wastewater and stormwater runoff from nearby towns, lack of saltwater backflow, farming practices, and sediment build up. However, the majority of participants acknowledged that the landowners get singled out.

The community members attempt to reach out to the governing bodies with suggestions and feel neglected when those ideas fail to come to fruition. Interviewee C says, "We [the Rangitāne] get a memorandum partnership and a memorandum of understanding... Memorandum partnership, there's only one partner and that's the council so where's the partnership." However, multiple interviewees are optimistic about the future. Interviewee D says the Rangitāne's relationship with the GWRC is better than it was ten to twenty years ago and that they want to move forward with the GWRC. Interviewee D sees room for improvement, but also acknowledges that they have passionate and knowledgeable people in place and that their relationship is improving. Similarly, Interviewees R and S, both landowners, agreed that they need good people managing the region. These landowners, like the Rangitāne, want passionate and knowledgeable people working for the GWRC that understand their practices. Even though the Rangitāne and landowners do not agree about how the GWRC should manage the lake, they have the same core values with respect to the people managing the lake and they demonstrated they can understand each other's situations. This is important because the entire community needs to work together in order to enhance the Wairarapa Moana.

It was evident that a number of stakeholder groups cared about the iwi's relationship with lake management. Interviewee I, a DOC representative, said, "We should never allow ourselves to underestimate the cultural values of Wairarapa Moana, and we should do everything within our power to provide whatever relief to those reduced values we possibly can." The Rangitāne want to help manage the lake. This is an important aspect of how the GWRC should change their management strategy going forward regarding Wairarapa Moana, especially in light of the treaty settlement process.

In addition to lack of coordination, an average of 38.5% of the respondents fell under the "No Comment" category on the data that we analyzed. This is anyone who did not mention a topic or have an opinion within our interview questions and includes all those who were unknowledgeable about the subject, or did not find the subject important. A high of 58.6% of the respondents for the Ramsar data failed to give an answer or did not feel they felt qualified to respond. Although these individuals may have an idea on the topics discussed, this highlights a general lack of understanding among members of the community about important topics. Going forward, the GWRC should pay more attention to informing the public about the issues that affect them.

The lack of knowledge we found is not only within management, but also within the community. Interviewees did not know how the barrage gates worked, did not know about Ramsar status, and one person was unsure who was managing the gates. Interviewee H from DOC describes the role of organizations: "From our point of view, we have to better understand how farming works and production needs and requirements of farmers so that we can better identify opportunities to work together. I think that's beholden on us to understand farming better and listen to their points of view."

Overall, many people saw room for improvement with the Lower Wairarapa Valley Development Scheme. They suggested ideas such as a better fish passage, more flow in the water system, more research and technology, and more iwi consideration. Interviewee H comments, "There's always room for improvement and I think as managers we are duty bound to always be looking for ways to improve."

Chapter 6 – Discussion

Next year, in 2017, two different project teams from Worcester Polytechnic Institute will continue to work on this project with entirely different stakeholders. Unlike most IQP projects, this project will see a continuation, which allows us to offer suggestions for future work. Our project team hopes this discussion of our methods and analysis will help the continuation of this project in a more effective and efficient manner.

6.1 Effective Methods

There were a number of methods that were conducive to producing quality results for our stakeholder study. Many aspects of our project worked well, thanks to thorough planning during ID2050 and PQP.

Our success during ID2050 was largely due to the communication with Ian Gunn, our sponsor. We held Skype meetings with him twice a week. Regular communication greatly helped improve the team's background knowledge of the region. Ian Gunn's involvement in the region is extensive and he was an extremely valuable contributor to our project beyond his role as our sponsor. For future teams, we highly recommend interviewing Ian to fully understand the resource management conflict, and all of the intricacies behind this project. Unfortunately, Ian is retiring, but it is definitely important to maintain close correspondence with the sponsor liaison at GWRC.

The team realized that recording the interviews via a video recorder was an effective method. Often, with the combination of New Zealand accents and unfamiliar Māori words, we would be unable to understand the interviewee with the audio alone. Having the video was helpful when reviewing interviews that would have been otherwise difficult to understand. It helps to have two separate video recorders and to be prepared to split the teams in half when it is necessary to conduct two interviews at once.

An important factor when considering travel logistics is the train. Due to the limited schedule, it is more time efficient (and cost effective) to stay overnight in Masterton at Mawley Holiday Park in a standard cabin. Back to back days in the Wairarapa Region were extremely travel intensive unless we stayed overnight there. We noticed that travel used up most of the time

our team would have otherwise used for writing, transcribing and analysis. Although we were able to work on the train, it was without access to WiFi, and often without power outlets. Staying in Mawley Holiday Park allowed the team to make better use of our time, and conduct interviews that could not fit within the schedule of the train.

WiFi access is not easy to manage in the Wairarapa region. Most public libraries have free WiFi, but lack desk working space. The GWRC office and many of the places where we conducted interviews had WiFi for their employees that we were not able to access. The Masterton Library has WiFi, but it was very limited as to the sites we were able to access. Maintaining a group flashdrive and downloading necessary files ahead of time is important for being able to have a productive day.

6.2 Ineffective Methods

Upon reflection, the project team had a number of methods that were ineffective. During the 2017 project, it will be important to take note of the methods that were problematic for our group and improve upon them.

Most importantly, our original interview method was to develop open ended, semi-structured interviews. It was helpful to have open ended questions that led to valuable discussions about the topics, but some of the questions we asked were not direct enough and some interviewees would not respond with an answer relevant to the topic we wanted to analyze. This was problematic during the analysis section of the paper. Many times, there were topics that had no comment from several interviewees. This may have simply been a result of a lack of interest in that specific topic. However, when writing questions, the project team should have taken into account which specific topics we wanted to analyze. This was difficult for our team because we were unsure what type of conflicts would arise. Going forward, other teams can plan their interview questions around the conflicts identified in reports by the 2016 project teams.

Our time management was difficult due to the need to schedule interviews and our own time constraints. Travelling to landowners was difficult because many of them lived over a half hour from Featherston (where the train station is). Our project team was extremely lucky to have Ian Gunn as a sponsor, who was so generous and drove us to interviews all around the Wairarapa Region. For future teams, we recommend getting started scheduling interviews upon arrival in

Wellington. This makes it easier to get the interviews completed earlier in the term and will make travel logistics easier on a sponsor who is not Ian Gunn. Our project team was still interviewing people after we originally planned to finish. An important thing to consider with interview scheduling is that many interviewees with office jobs will be on vacation until late January in New Zealand, so interviewing farmers first is likely more efficient. Make sure to coordinate times with the other team so as not to schedule multiple interviews at the same time. Lastly, our team learned that busses do not stop unless you aggressively wave them down. This is important for future teams so that they do not miss as many trains as our team.

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Appendix A – Conservation Management Strategy for Wellington

Conservation Management Strategy for Wellington 1996-2005 (DoC, 1996)

LAKE WAIRARAPA WETLANDS – OBJECTIVES

1. Conservation of the ecological, historical and landscape values
2. Consultation with iwi/hapu to identify their management objectives and the protocols necessary to maintain the area's historical and cultural integrity
3. Integrated management of the Lake Wairarapa wetlands and their catchments to protect conservation values within the wetland area
4. Provision of passive recreation opportunities and interpretation of the natural and historic resources.

Appendix B – Introductory Email

Kia Ora <name>,

We are a group of students from Worcester Polytechnic Institute working with the Greater Wellington Regional Council on a stakeholder study of Wairarapa Moana concerning the Blundell Barrage Gates. In 2019 the resource consent that permits the operation of the barrage gates will be up for renewal. The Greater Wellington Regional Council has tasked us with speaking with the affected stakeholders and gathering their opinions on the subject.

We would like to interview you and as many other individuals in your (organization/ tribe) who would be interested in speaking with us. The goal of this project is to gather the needs and perspectives of the organizations and the more people we interview the more comprehensive the results will be. The Greater Wellington Regional Council will use this information to develop an application regarding the barrage gates. Ian Gunn has mentioned that he contacted you, and we look forward to further correspondence.

Thank you for your time.

Regards,
Natalie Diltz, Mechanical Engineering
Jena Mazzucco, Chemical Engineering
Austin Scott, Mechanical Engineering
Jeffrey Sirocki, Computer Science
Worcester Polytechnic Institute

Appendix C – Interview Protocols

C.1 Office of Treaty Settlements Interview Protocol

Overview:

What: Interview with the Treaty Settlements Rangitāne Negotiator. This interview will focus on gaining information about the current state of the settlement and how the process will proceed in the future, concerning overlapping settlement claims. This interview process will include all of the four members of the group.

Type of Interview: Structured Interview

Sampling: Purposive sampling

Goals of the interview: To understand treaty settlement with the Rangitāne and the overlapping claims process.

Planning Details:

Video/Sound RecordEd: No

Where: Office of Treaty Settlements, Level 3, The Justice Centre
19 Aitken Street
Wellington 6011
New Zealand

Interview Questions:

1. What is your job title?
2. Can you describe your responsibilities within your organization? What is your involvement with the Treaty Settlement process?
3. Can you provide a brief summary of the Rangitāne settlement process thus far?
4. What's the status of the overlapping claims process between the Rangitāne and the Kahungunu?
 - a. Can you describe the process for settling overlapping claims?
 - b. What assets are being offered to each group?
 - c. When do you believe the Crown will finalize overlapping claims between the two iwi (Rangitāne and Kahungunu)?
 - d. Will the overlapping claims result in a reduction in the financial and commercial redress money for the Rangitāne?

5. What do you think the final outcome of the settlement process will be?

Notes: Insight into the settlement process may lead to additions and edits of objective 2 questions. The treaty settlement will influence the amount of political power the Rangitāne have regarding the issue. If the Crown does not finalize the settlement, we may need to employ a new strategy to interview the Rangitāne.

Update: After reaching out to the Office of Treaty Settlements, they notified us that much of the information we were looking for was classified so we decided not to interview them.

C.2 Greater Wellington Regional Council Interview Protocol

Overview:

What: The entire team will facilitate these interviews with representatives from the Flood Protection Department at the Greater Wellington Regional Council.

Type of Interview: Open-ended interview

Sampling: Availability sampling and snowball sampling

Goals of the interview: To understand lake management, resource consent process, and the region.

Planning Details:

Video/Sound Recorded: No

Where: Masterton GWRC Office

With Whom: David Boone

Roles:

Facilitate/Ask Questions

Take Notes

Interview Questions:

1. Where do you live (city and region)?
2. How long have you lived in New Zealand?
3. Can you describe your activities within the GWRC?
4. Can you describe your job title within the GWRC?
5. Can you explain how the GWRC interacts with the Māori?
6. Can you explain the economy of Wairarapa Moana and how it is changing?
 - a. Can you explain the significance of farming in the region?
 - b. How will the cost of the earthquake contingency plans and barrage gate replacement effect the public support of the resource consent?
7. Can you explain how the government is structured in the Wairarapa region?
 - a. Can you explain the structure of the GWRC?
8. Can you explain the ecological impact of spraying the willow trees?

- a. Why does the SWDC not pay into the Lower Wairarapa Development Scheme? What would happen if they did?
- 9. What changes would occur if the iwi groups had greater control over the lake?
- 10. How has the ecology of the region degraded over time?

Notes: Questions are to better our understanding of the background of the region and stakeholders.

C.3 Rangitāne Interview Protocol

Overview:

What: Two people will conduct these interviews. They will involve gaining information about the points of view of the Rangitāne concerning the management of Lake Wairarapa.

Type of Interview: Semi-structured interview

Sampling: Snowball sampling

Goals of the interview: Understand opinions about region, how involved they are, what they would like to see happen to the region, what they value most

Planning Details:

Video/Sound Recorded: Ask the interviewee if we can record them. Ask the interviewee if they would like to remain anonymous. Ask the interviewee if there is anything they would like to have taken off the record.

Where: Masterton Office

With Whom: Kaumatuas (elders), cultural advisors, and iwi members

Roles:

Facilitate/Ask Questions

Take Notes

Transcribe

Interview Questions:

1. What is your occupation?
2. Where do you live (city and region)?
 - a. How long have you lived in the Wairarapa region?
3. Can you describe your role in your iwi?
4. How do the Rangitāne culturally value Wairarapa Moana?
 - a. What aspects of Wairarapa Moana are culturally significant? How/Why?
5. What do you value most about Wairarapa Moana? Why?
6. How does Wairarapa Moana provide for your needs?
 - a. How is the Wairarapa Moana used recreationally by the Rangitāne?

7. How are the native fish important to the Rangitāne?
8. How is water culturally important to the Rangitāne and how does the quality of water affect this?
 - a. What do you think contributes to the poor water quality?
9. What do you know about flooding in Lake Wairarapa?
 - a. Do you think flooding is a major issue in the region?
 - b. Does flooding affect you?
 - c. Is flooding well-managed?
10. What do you think of the current lake water levels?
 - a. Would you like to see them change? If so, how?
11. What are your views on irrigation in the region?
12. What is your opinion on the current status of the wetlands?
 - a. What would you like to see change?
13. What is your opinion on the RAMSAR status?
14. What are your thoughts on the current state of the wildlife in Wairarapa Moana?
15. Do you know how the fish have been affected by the flood prevention scheme?
 - a. What should be done to mitigate the negative effects of the gates on the fish?
16. What other issues regarding the flood prevention scheme do you think are important? Please elaborate.
17. Are you aware of any conservation efforts regarding Lake Wairarapa?
 - a. How important to you are conservation efforts regarding Lake Wairarapa?
 - b. Do you think there is a need for anti-pollution measures to be taken? Please specify.

18. What is your opinion on the Lower Wairarapa Valley Development Scheme?
- a. What do you think about the management of the Barrage Gates?
 - i. How does the operation of the gates affect your daily life?
 - b. How do you feel about the Ruamahanga cutoff?
19. What is your biggest complaint with the current flood prevention scheme?
- a. What advantages are there with the current flood prevention scheme?
 - b. What disadvantages are there with the current flood prevention scheme?
20. What do you know about the barrage gate resource consent?
- a. Are you aware that the barrage gates resource consent expires in 2019?
 - b. How could the barrage gates be operated in the future to suit your needs?
 - c. What do you think would be a reasonable compromise regarding the barrage gates?
 - d. What stakeholders would a compromise need to involve?
21. Please list the problems that have arisen from the flood prevention scheme based on their importance.
22. If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?
23. Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Notes: Respect and carefulness is absolutely necessary to not offend the Māori. After speaking to the Office of Treaty Settlements, we will add technical questions to better gather an understanding of the ecological and cultural interests.

C.4 Department of Conservation Interview Protocol

Overview:

What: This study will involve interviewing the Department of Conservation, two group members per interview, in order to understand how they feel about a variety of issues regarding the barrage gates.

Type of Interview: Semi-structured

Sampling: Expert Sampling and Snowball Sampling

Goals of the interview: Determine the DOC's overall stance regarding the barrage gate resource consent renewal by talking to DOC representatives. Determine environmental impact of the gates by talking to DOC ecology experts.

Planning Details:

Video/Sound Recorded: Ask the interviewee if we can record them, ask the interviewee if they would like to remain anonymous, ask the interviewee if there is anything they would like to have taken off the record.

Where: Masterton and Wellington DOC Offices

With Whom: Environmental experts

Roles:

Facilitate/Ask Questions

Take Notes

Transcribe

Interview Questions:

1. What is your occupation?
2. Where do you live (city and region)?
3. How long have you lived in the Wairarapa region?
4. Can you describe your role in Department of Conservation?
5. What do you value most about Wairarapa Moana? Why?
6. What is the importance of Wairarapa Moana to the DOC?
7. How does Wairarapa Moana provide for the community's needs?
8. How does the flooding, or lack of flooding, affect the wildlife in the region?

9. Do you think flooding is a major issue in the region?
10. Is flooding well-managed?
11. What do you think of the current lake water levels?
12. Would you like to see water levels change? If so, how?
13. Do you agree with current flood management or should it be changed?
14. What is the state of the water quality in Lake Wairarapa?
15. How do the barrage gates affect water quality?
16. How could it be improved?
17. What are your views on irrigation in the region?
18. What is your opinion on the current status of the wetlands?
19. What would you like to see change?
20. What is your opinion on the RAMSAR status?
21. Can you explain the conservation efforts regarding Lake Wairarapa?
22. Do you think there is a need for anti-pollution measures to be taken? Please specify.
23. What do you know about the Lower Wairarapa Valley Development Scheme?
24. What do you know about the Barrage Gates?
25. How does the operation of the gates affect daily life?
26. How do the gates affect the environment?
27. Does the operation of the barrage gates have any impact on DOC activities? If so in what way?
28. How are the fish important to DOC?
29. Which fish species specifically (native fish)?
30. How are they affected by the barrage gates?
31. How could you mitigate the negative effects on the fish caused by the barrage gates?

32. What do you know about the barrage gate resource consent renewal in 2019?
33. How could the barrage gates be operated in the future to suit the region's many environmental needs?
34. What do you think would be a reasonable compromise regarding the operation of the barrage gates?
35. What do you know about the Ruamahanga cut off?
36. What is your opinion on the cut off?
37. What are the environmental impacts of the river being cut off?
38. Should anything be done about the water stagnation?
39. What overall advantages are there with the Lower Wairarapa Valley Development Scheme?
40. What disadvantages are there with the Lower Wairarapa Valley Development Scheme?
41. What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.
42. Which of these issues do you think should be addressed first?
43. If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?
44. Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

C.5 South Wairarapa District Council Interview Protocol

Overview:

What: This will involve interviews with the South Wairarapa District Council and each of their three branches. The SWDC governs the entire South Wairarapa Region and will be able to explain where the interests of the public are regarding the barrage gates. We plan to hear a wide variety of responses from this group because of the broad range of representation (from Māori to Councillors).

Type of Interview: Semi-structured

Sampling: Expert Sampling and snowball sampling

Goals of the interview: To determine the perspectives and needs of the public in the South Wairarapa Region and where different members of the SWDC stand regarding the issue.

Planning Details:

Video/Sound Recorded: Ask the interviewee if we can record them, ask the interviewee if they would like to remain anonymous, ask the interviewee if there is anything they would like to have taken off the record.

Where: Martinborough Office

With Whom: Targeting the executive members for each branch including Councillors, Community Board Members and Māori Standing Committee Members.

Roles:

Facilitate/Ask Questions

Take Notes

Transcribe

Interview Questions:

1. What is your occupation?
2. Where do you live (city and region)?
 - a. How long have you lived in the Wairarapa region?
3. Can you describe your role in the South Wairarapa District Council?
4. What do you value most about Wairarapa Moana? Why?
5. What is the importance of Wairarapa Moana to the South Wairarapa District Council?
6. How does Wairarapa Moana provide for the district's needs?

- a. How is Wairarapa Moana used recreationally?
- 7. How do you view the water quality in Lake Wairarapa?
- 8. What are the SWDC's views on fishing and maintaining native fish populations in Wairarapa Moana?
- 9. What do you know about flooding in Lake Wairarapa?
 - a. Do you think flooding is a major issue in the region?
 - b. Does flooding affect the region?
 - c. Is flooding well-managed?
- 10. What do you think of the current lake water levels?
 - a. Would you like to see it change? If so, how?
- 11. What are your views on irrigation in the region?
- 12. What is your opinion on the current status of the wetlands?
 - a. What would you like to see change?
- 13. What is your opinion on the RAMSAR status?
- 14. Are you aware of any conservation efforts regarding Lake Wairarapa?
 - a. How important to you are conservation efforts regarding Lake Wairarapa? Why?
 - b. Do you think there is a need for anti-pollution measures to be taken? Please specify.
- 15. What do you know about the Lower Wairarapa Valley Development Scheme?
 - a. What do you know about the Barrage Gates?
 - i. What do you know about the barrage gate resource consent renewal in 2019?
 - b. Does the operation of the barrage gates have any impact on the activities of the SWDC? If so in what way?
 - i. How could the barrage gates be operated in the future to suit the district's needs?

- ii. What do you think would be a reasonable compromise regarding the barrage gates?
 - c. What do you know about the Ruamahanga cutoff?
 - i. What is your opinion on the Ruamahanga cutoff?
 - ii. What do you think of the diversion of the Ruamahanga River?
 - iii. Being a site for recreation, what is the appeal for maintaining the current conditions of the cut off
 - d. What overall advantages are there with the current Lower Wairarapa Valley Development Scheme?
 - e. What disadvantages are there with the current Lower Wairarapa Valley Development Scheme?
 - f. What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.
 - i. Which of these issues do you think should be addressed first?
16. If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?
17. Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

C.6 Landowners Interview Protocol

Overview:

What: This study will involve each of our group members, four in total, interviewing landowners around the Ruamahanga Cutoff and barrage gates to understand their point of view on Wairarapa Moana resource management.

Type of Interview: Semi-structured interview

Sampling: Purposive sampling

Goals of the interview: Identify needs and perspectives of these specific farmers.

Planning Details:

Video/Sound Recorded: Ask the interviewee if we can record them, ask the interviewee if they would like to remain anonymous, ask the interviewee if there is anything they would like to have taken off the record.

Where: Around Lake Wairarapa

With Whom: List of farmers provided by Ian Gunn

Roles:

Facilitate/Ask Questions

Take Notes

Transcribe

Interview Questions:

1. How long have you lived in the Wairarapa region?
2. Can you describe your farming activities and lifestyle?
3. Are you involved in any organizations?
 - a. If so, what organizations?
4. Are you involved with politics? If so, what do you do?
5. What do you value most about Wairarapa Moana? Why?
6. How does Wairarapa Moana provide for your needs?
7. What's the most important aspect of Wairarapa Moana? Why?
8. Can you explain the quality of soil?
9. What do you know about flooding in Lake Wairarapa?

- a. Do you think flooding is a major issue in the region?
 - b. Does flooding affect you?
 - c. Is flooding well-managed?
 - d. Do you agree with current flood management or should it be changed?
10. What do you think of the current lake water levels?
11. Would you like to see it change? If so, how?
12. How are the fish important?
- a. How do you feel about the native fish? (Eel, whitebait, mud trout)
 - b. How do you feel about the exotic fish? (Rainbow, brown trout)
13. How do different bird species impact the region?
14. What is the state of the water quality in Lake Wairarapa?
- a. Do you think farming has an effect on the water quality of Wairarapa Moana?
 - b. How could it be improved?
15. What are your views on irrigation in the region?
16. What is your opinion on the current status of the wetlands?
- a. What would you like to see change?
17. What is your opinion on the RAMSAR status?
18. What ramifications does the RAMSAR status have on the farmers?
19. How is the area important for recreational activities?
20. Are you aware of any conservation efforts regarding Lake Wairarapa?
- a. How important to you are conservation efforts regarding Lake Wairarapa? Why?
 - b. Do you think there needs to be more anti-pollution measures to be taken? Please specify.
21. What do you know about the Lower Wairarapa Valley Development Scheme?

- a. What do you know about the Barrage Gates?
 - i. How does the operation of the gates affect daily life/farming?
 - ii. How do the gates affect the environment?
 - iii. How do the barrage gates affect water quality?
 - iv. What do you know about the barrage gate resource consent?
 - (1.) Are you aware that the barrage gates resource consent expires in 2019?
 - (2.) How could the barrage gates be operated in the future to suit the region's many environmental needs?
 - (3.) What do you think would be a reasonable compromise regarding the operation of the barrage gates?
- b. What do you know about the Ruamahanga cutoff?
 - i. How does the cutoff affect you?
 - ii. Is there anything that could be done to mitigate any negative effects caused by the cutoff?
- c. How much do you think you benefit from the Lower Wairarapa Valley Development Scheme?
 - i. Do you believe the benefits from the gates are worth your personal annual investment?
 - ii. Should the funding plan be changed?
- d. What overall advantages are there with the current flood prevention scheme?
- e. What disadvantages are there with the current flood prevention scheme?
- f. What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.
 - i. Which of these issues do you think should be addressed first?

22. If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

23. Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

C.7 Recreational Water User Interview Protocol

Overview:

What: This study will involve each of our group members, four in total, interviewing recreational water users and specifically a group of barefoot waterskiers.

Type of Interview: Semi-structured interview

Sampling: Purposive sampling

Goals of the interview: Identify needs and perspectives of these specific farmers.

Planning Details:

Video/Sound Recorded: Ask the interviewee if we can record them, ask the interviewee if they would like to remain anonymous, ask the interviewee if there is anything they would like to have taken off the record.

Where: Around Lake Wairarapa

With Whom: List of recreational water users provided by Ian Gunn

Roles:

Facilitate/Ask Questions

Take Notes

Transcribe

Interview Questions:

1. Can you describe your activities on the water?
2. Can you describe your lifestyle?
3. Who has access to the water body that you're affiliated with?
4. Are you involved with any other organizations?
5. How does your organization have access to the water body? Through an agreement a local council?
6. What do you know about flooding in Lake Wairarapa?
 - a. Do you think flooding is a major issue in the region?
 - b. When it floods, does that affect your ability to recreate?
7. Do you think the flooding has been well managed?

8. What do you think about the current target water levels for Lake Wairarapa?
9. Are the fish in the body of water important at all to you?
10. How do different bird species impact your activities?
11. What is the state of water quality like?
 - a. In Lake Wairarapa?
 - b. In the cutoff?
 - c. Do you think farming has had an effect on water quality?
 - d. How could water quality in the area be improved?
12. What are your views on irrigation in the region?
13. What is your opinion on the current status of the wetlands next to the lake?
14. What do you know about the Ramsar status of the lake?
15. Do you think there needs to be more anti-pollution measures taken?
16. What do you know about the Lower Wairarapa Valley Development Scheme?
 - a. What do you know about the barrage gates?
17. How much would you say you benefit from the LWVDS?
18. Are you aware of the funding plan for the operation and maintenance of the barrage gates?
19. What are the overall advantages of the current setup?
20. What are the disadvantage of the current setup?
21. If there was one thing you'd like to see going forward about the management of the area what would it be?
22. Is there anything else you'd like to tell us as it pertains to flood protection or the Wairarapa water system?

Appendix D – Kohunui ‘Big Fog Marae’

Ra Smith arranged for us to attend a Marae at *Kohunui*, or “Big Fog,” located near Lake Wairarapa, on January 27th. The entire experience was extremely rewarding. We gained a better understanding of Māori tradition, interaction, and overall culture through a welcoming ceremony, hongi (handshake), mihi (story), and history discussion. The conversations and observations allowed for more comprehensive interviews.

They welcomed us with a very emotional traditional song, sung completely in Māori, led by the women of the tribe. They welcomed not only the individuals, but all of their ancestors. As they were singing, we approached the marae slowly, stopping several times. Ra Smith’s mother led us the entire time. As we entered that Marae, we were careful to remove our shoes as a sign of respect. We all filed in, having the men sit in the front and the women behind them. They explained that these ceremonies did not necessarily commence with friendly outsider tribes, so this was a means of protecting the women of the tribe. The iwi performed the ceremony entirely in Māori. It involved chants and body movements that each had its own special meaning. At one point, they shared a part of their culture by singing a song that symbolizes their region and their home and allowed us to do the same. This was a way of communicating where we came from and connecting based on our pasts. Completing the ceremony, each person in our group exchanged a hongi with the members of the iwi. It represents sharing the breath of life with each member of the tribe.

Once the ceremony was over, they started speaking in English. Historically, maraes were often the only place the Māori could speak their language freely, and without prejudice. We had lunch with them and had time to mingle. We talked about our ancestors and where we came from. They explain that we are now a part of them and share the same responsibilities.

They encouraged us to ask questions, and they explained the importance of their carvings and pictures, and the history of their ancestral lines. Through this interaction we learned that the Treaty Settlement claim will likely result in the gifting back of the lake bed to the iwi, however the Crown will not gift Lake Onoke back, as it is a river mouth. When they started talking about what the lake used to be like, many of them teared up and became emotional. This aspect is extremely valuable to this project, because we it allowed us to see the raw emotions and interactions of a group of individuals, who may not share their thoughts at the same intensity level during a personal interview.

Appendix E – Transcribed Interviews

We conducted twenty-four interviews and each interview transcription is contained in this appendix. This appendix due to its size is broken up by stakeholder further. Section E.1 contains the three Rangitāne transcriptions. Section E.2 contains the seven Department of Conservation transcriptions. Section E.3 contains the four South Wairarapa District Council transcriptions. Section E.4 contains the six landowner transcriptions. Section E.5 contains the three recreational user transcriptions.

The following transcriptions are nearly word for word. There was one interview where we experienced recording difficulties at the beginning and the end, which we denote in the transcription. All transcriptions denote gaps in the transcription with ‘...’ and when we could not understand what was being said we denote uncertainty with ‘[]’.

E.1 Rangitāne

A. Interviewee A

Austin: So what is your occupation?

Interviewee A: Officially education coordinator, but I'm really a writer.

Austin: Where do you live in the Wairarapa Region?

Interviewee A: I live in Landsdowne Masterton, which is a suburb north of the town. I come from Tiororui which is just to the east of the town and that's also where my ancestors from my adopted family have lived for hundreds of years.

Austin: Can you describe your role in your iwi?

Interviewee A: I'm kind of a... I guess the title that I have whether I'm paid for things or not is Ki Tui Tui which is kind of a writer/story teller. So I need to find out about a wide range of information, not just historical, but social, environmental and think of ways of getting that information to people.

Austin: How do Rangitāne culturally value Wairarapa Moana?

Interviewee A: I guess if you look at things that the mountains and the waterways were here before people, and so we seem them as ancestors and things that should be treated with reverence and looked after. And everything comes from water, we come from water, that kind of stuff. The earth, the land comes up from water and... yeah so that combination of the land from water is kind of what keeps us here. We shouldn't let any more trouble or we're not going to be able to live where we are currently. Pretty much a simple way of looking at it.

Austin: What aspects of Wairarapa Moana specifically are culturally significant?

Interviewee A: Everything about it that's identified as one of the first places that is recorded in our history. There's I supposed what you'd call a myth about the local Māori who fished up the north Island and they called it the big fish from the ocean and we're the head of the fish, Te

Upoko o Te Ika. So the Wellington harbor and Palliser Bay are parts of the fish and Wairarapa Moana is too tied up in that. So yeah starting from there and coming forward with, it's also associated with Kupa another famous explorer. Some say the name 'Wairarapa' is a variation on a name that he came up from an event where he looked over his shoulder as he was leaving Lake Onoke and Lake Ferry, and then from there he's the main thing it's a [Pataka] or a pantry. So the contents or the animals that live in the area, those provided food. And the flora that surrounded the means by which to get that food, to build.

Austin: What do you value most about Wairarapa Moana?

Interviewee A: I think that the fact that , well probably that you can go down there and... if I think of Wairarapa Moana I don't just think of the main body of the lake, I think of the Ruamahanga River going into it... or... it can't go into it. Or the fact that it can't go into it. And Lake Onoke and Lake Ferry and that big connected body that's down south. And I like fishing and things, yeah, so that's a home for a whole lot of special fish... I don't think it's the most pretty lake... [inaudible due to other noise in the room]... It's home to a lot of special stuff.

Austin: How does Wairarapa Moana provide for your needs?

Interviewee A: Well to be honest I only go down there a few times a year. So, if anything it's probably a recreational need. Just kinda going down with the family sometimes is just... spend half the day wandering around the shore line.

Austin: Do you go fishing or just sit on the shore?

Interviewee A: No just have a look, we might pick up some drift wood, look for kahkaha, fresh water mussels we aren't taking the actual live ones, but just see if they're there or then we might spot some odd fish or birds and sometimes the view there across there across the Rimutakas on the western side mountains, and over on the east is what's been taken.

Austin: How are the native fish important to the Rangitāne?

Interviewee A: Well, you see when you get down to it again, the eels especially, food source, economic staple in days gone by and now they're ummm declined in numbers majorly. And there's a conservation part to that as well. Then just I think that with some of the other species,

commonly termed as whitebait, that they also have had a bit of a hard time so they are endangered as well. If you want to get into the cultural side of... everyone's descended from the Atua... gods that's meaning that we're all connected through the environment.

Austin: How's ... water culturally important to the Rangitāne and how does the quality of water affect this?

Interviewee A: No Water No Life. [] which means breath of life, it means everything needs to breathe so if there's pollution, water can't breathe. If we have no trees, you know that tree hugger thing? If the trees are polluted then that oxygen stuff can't happen. And again that means that that affects us, you know we can't breathe so it has a final effect. It starts with water and that's that water cycle or whatever, you know the creation myth? Of Ranginui the sky father and Rapa Tuinui the Earth mother?

Austin + Jena: No

Interviewee A: No? So that's kind of like Dane was asking me a question and it's kind of a nothing lasts forever and it's interesting it also sort of matches up with the big bang theory. It's nothing less than for eons and out of that came the primal parents which was tangānui the sky father and papa tuinuki the earth mother and they were for a long time in a close embrace, but within that time they had 70 plus children and they became the [] or 'gods'. But these kids weren't able to stand up and there was hardly any light so they got tired of it and eventually they decided to separate their parents. Which they argued about but they did, and so rangānui got thrown into the sky and papa tuinuki stayed as the earth mother and that gave us the world of light ... which we live in today. And these aror, so you have tangaror god of the water sometimes we say the sea, tafini mati god of light and a whole lot of others. They lived and they bred with supernatural female beings. And from that came all the creatures of the earth that they endeared with life. So because they were forced apart, rangānui still cry for papa tuinuki and that's the rain and papa tuinuki still cries for rangānui and that's condensation, mist and so forth. See the rain hits her body and the highest points flow down to the lower points through their children along the way in life and then it goes back up. See how it's the water cycle? In mythology... so it was encoded messages in there, so that's the whole beginning of importance for water and all that kind of stuff.

Austin: What do you think the quality of the water is like in Wairarapa Moana?

Interviewee A: I would imagine that it's pretty average. And that's partly through experience of having been involved in some water testing up this end of the valley coming straight out of the tangarua mountains where it enters the valley and that's very good, very good quality and the further you go south it just gets worse and worse and that's been tested in lots of results and results and things. So there's the main flow area that was flushing the lake, but it's diverted so I imagine it's also getting all the little streams, farms and stuff coming and towns that. I say it but I don't know the figures exactly. I know that it gets worse as you go further south.

Austin: What do you think contributes to the poorer water quality in the south region?

Interviewee A: Just that build up, for some reason people, other than the area that we farm and what's coming off the land there, the town planners, for a long time, put all of the sewage and the dumps right next to the river. And that's the town as they go down the valley. Some of the drains leaked into streams, there's one coming off Landsdowne where I live. So I mean people washing their car or putting stuff down the sink and all that is getting into the open water bodies and is getting into Indian Lake which is right down there, which goes straight into the Ruamahanga. It goes down to Carterton where it gathers more of the same stuff. So yeah, there's a lot of farms and wineries and things like that probably contribute in a wee bit.

Austin: What do you know about flooding in the Wairarapa?

Interviewee A: There used to be ... We have a currency called kawa near my stuff and centered around the Marai and it's like the protocols or way that things happen, our belief is that everything either a raindrop or a tree is a kawa. For us, that's a raindrop that landed on the mountains up there, it should be able to make its way the way as it's supposed to be, down into Palliser Bay and then it gets lifted up and that or the tree which comes from the sea and grows and blah blah blah, it gets all altered when people start mucking around with things. In one of the... In our family when they tried to determine ownership of Wairarapa Moana in the 1800s, they sent a guy called marikuy tapu, who was from up here, but he went and represented his people, his family and was acknowledged as one of the original owners at the time, so what that meant is, say when it was autumn, he could get in that little space and go and fish for eels. One

of the important things that happened then was called the hinu drawni, which meant that when the Onoke sandbar closed and the rains came, that the waters would back up and it would essentially flood and the migratory eels would go down and they'd get stuck. Now, when the waters recede there would be eels. So in that sense, flooding was natural and was really important. Of course the big thing that was in the book and everywhere else is that when the people started to farm there, they didn't want flooding. Hence, I think the reason you guys are here, the barrage gates and the diversion and so forth. So flooding, I mean it's controlled as fair as possible, yeah because of people's needs. Yeah as opposed to what should happen naturally.

Austin: Do you think flooding is a major issue in the region?

Interviewee A: That depends how you look at it, yeah, for individuals whose livelihoods etcetera, umm their property relies on it, yeah sometimes that's bad news, I mean that's serious no matter who you are. Yeah, but other times, you know it's like, thinking another of these concepts and these things, is when you know you have a blockage in a vein or something? That doesn't get flushed out? We get sick. You know? The veins of papa tuinuku are the rivers, the main one's the Ruamahanga and then you've got the Lake at the bottom and if they can flush then she gets sick and you're going to get floods. Yeah, a buildup of sticks and gravel and things like that, yeah that might be what's meant to happen, but we don't want that because that will affect the towns and things which is fair enough. But currently it could have consequences. As an example, this was about early 2000s we had some big floods here. Where people had blocked off streams or dried them out, when the water had nowhere else to go you know it just went straight back to them, but in the meantime people had built their houses right next door to the old streams and things they ended up losing their house which is pretty serious. Whereas if we recognized where the water would naturally go and just build them away further, we wouldn't have encountered that problem. So it's an issue, but sometimes it's manmade anyway. See we try to avoid that from a human perspective.

Austin: Has flooding affected you?

Interviewee A: Yeah, but in a fun way actually. Yeah, in fact I've stood out in hail and snowstorms and things and it just sort of rushes down, especially if the place had a bit of an angle on it. Yeah so we'd rush out there, run around in it, jump up and down and have fun. Or

sometimes when the big ones have come, we've gone and jumped in the truck to have a look, but I mean at the same time thinking about the people who've water gone two meters up the walls in their house, too. So no, it hasn't affected me or my family in a bad way.

Austin: Do you think they've managed the flooding appropriately?

Interviewee A: Yep. Coming from that perspective of now, yeah, but I'd like to see things be more natural, if possible.

Austin: What do you think of the current lake water levels?

Interviewee A: Have you guys been down to Kahunui Marae? ... It's on the side of the road as you're going down the eastern side of the...

Austin: We went to 'Big Fog' or something? I don't know what that translates to.

Interviewee A: Oh, down as you're going to Lake Ferry?

Austin: I think so.

Interviewee A: Well down at the bottom, so you've got a... ummm, the problem is you can't get to the barrage gates from that side can you... Well so you go to the southernmost marae in the region and then what you do in the old days, the lake used come up to almost lapping on the foot of the little hill that that sits on right by the marae and up to Martinborough the town. So, I mean they're managed for that same reason. Yeah, uh-hm mmmm, I don't know myself, I think sometimes too much is done for small groups of people. Then again, it's not where it's supposed to be. Not how I think it's supposed to be, but how nature is supposed to be.

Austin: So how would you like to see the water levels changed?

Jena: Maybe not even just the water levels, maybe just the system in general?

Interviewee A: Well I mean the thing is that there's only one salt marsh left and there's valuable plants, but they're on the edge of the lake now. The thing is if you change the level then, you know, you sacrifice them. Yeah, that stands so unless you can reclaim or give back more land to do something about them, yeah I don't know whether it would. I'd like to see more flow go

through there. Yeah, I've planted trees along where the river used to go through at the diversion and just, you know, birds and poop and smelter and stuff like that. Yeah, but all the good work that all the landowners have, and the council and people, have put into riparian planting and trying to at least beautify it. But yeah it'd be nice if some flow could get through.

Austin: What are your views on farming irrigation in the region?

Interviewee A: Ahh, there's only so much water. We know, I mean everybody notices that. Yeah and perhaps there's certain people are able to use more water than their share. That's the thing, yeah, and that's obviously mostly farmers. Yeah, they would say that they need the water, etcetera and probably so, but what does it mean for others and further down the track? Yeah, they're big questions.

Austin: What is your opinion on the current status of the wetlands around Lake Wairarapa?

Interviewee A: So yeah, they're special. They're special places that contain a lot of plants and animals. It's almost artificial because what it's saying is they've come about because the lake's been made smaller. So they would've been a lot bigger... far more distance from what is now the bed of the lake, which actually makes them kind of more special because they're kind of remnants.

Austin: What are your thoughts on the current state of wildlife in Wairarapa Moana?

Interviewee A: Some of the native and indigenous and endemic species have somewhere where they can live and because there's more awareness, then there's being more protections given to them, but then there's also the introduced species, which upset the balance of everything. So on one hand there's a lot of cool wildlife in there and on the other hand there's some [exotic] stuff that's probably almost out of control and we've got to get rid of.

Austin: Do you know how the fish have been affected by the flood prevention scheme?

Interviewee A: Fish don't time their migratory patterns according to people, when they want to open and close the concrete gates. So that along with a number of other factors would've adversely affected the fish and they don't... also you know, that sometimes they're not gonna find the passages that are there for their use but...

Austin: So what should be done then to mitigate the negative effects of the gates on the fish?

Interviewee A: Uhh... get rid of them... no *laughs* 'yeah get rid of the gates'... or redesign them, you know the holes in the wall. Yeah, at least look at that.

Austin: I know we heard a lot of the fish like to swim near the top when they're migrating back and the passages are kind of near the bottom, so that's kind of...

Interviewee A: Yeah yeah, you've got a bunch of different species, some are top and some are bottom and the different time of the day is going to affect them.

Austin: So what other issues regarding the flood prevention scheme do you think are important?

Interviewee A: That's mainly the... rubbish builds up around the gates. There's containers, plastic bags, often other things... fishing gear. Yeah I just suppose it's getting pushed, 'cause I was down there on a little dinghy just south of the barrage gates and we actually went up on the sand bar and watched the changing of the tide and then when we came back up we did a couple of very simple experiments as to how far the tide pushed up, which was basically dropping a stick in the water and... *circular hand motions* and it went up quite a way. So either way, you see the push that can occur and if there's something like that *makes a dam with his hands* they're all going to gather up in one area, yeah because it can't go nowhere else. Yeah and I suppose too, if there's some of that stuff coming off boats and it's petrol, things like that, oil, some cleaning products and the containers split, you from being banged about and things just there. The fish are there as well and that's that breathing factor.

Austin: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee A: Yup, I know a lot of school groups going down there, the councils, iwi, interest groups are doing a lot.

Austin: How important are these conservation efforts to you?

Interviewee A: Oh yeah very important, very important and I'm glad it's happening because everything starts from up here. I think originally they were just looking at the lake, but probably more the iwi than anyone else that's said 'oh wait a minute,' everything comes from the top end

and then effects what's down below. So, now it's opened up to the whole river system. So that's... that combined is really important.

Austin: Do you think there is a need for more anti-pollution measures to be taken?

Interviewee A: Yeah definitely, yeah.

Austin: What is your opinion on the Lower Wairarapa Valley Development Scheme as a whole?

Interviewee A: Well it's gonna, if it can occur, there needs to be a balance between the environmental interest and the economic ones because I think the economics really won out over the years.

Austin: What do you think about the barrage gates specifically?

Interviewee A: Oh, they serve a purpose. Yeah, but they also are a pain in that they for example, they restrict the movement of the fish. If it was nicer you could maybe, you know, entice a bit more tourism down there, but the gates... you know if the animals can't get back and forth, do their thing, then they're contributing to the area not being more enhanced to attract more people. The economy may offset... Also in other areas, keeping culture and things.

Austin: How does the operation of the gates affect both your life and members of the iwi's daily lives?

Interviewee A: To be honest, it doesn't really affect my life. I was going to say that sometimes that the Lake is the Jewel in the crown of that, but from the perspective of someone who has... who doesn't have the water up here (you know we have smaller lakes). But I know the purpose that I know the lake is used for, or appreciated for. We have, up here, different ways of viewing it. So I'm aware it's there and I know a little bit about its history and what's happening, umm that the efforts to enhance it are really neat, but that doesn't affect me.

Austin: How do you feel about the Ruamahanga Cutoff? That strip of water that's kind of stagnant, the old path of the river.

Interviewee A: I'm aware that some of the farmers there beside it would like it to be reinstated into the river into the lake. Yeah. Yeah, I mean it's really nice, but it's quite stagnant and it's stinky. As I was saying, I've been there and yeah, and if everyone or if most people think [something should be done about the cutoff], then it seems like a good idea because it's a fairly substantial piece of water for all of that dirt and duck poo and swan and dead stuff. Yeah, have you seen it down there? It reduces people to be able to go and do, you know it'd be good for skiing, you know water skiing and that sort...

Austin: Yeah I know we were down there yesterday and saw a couple water skiers.

Jena: They were pretty good.

Interviewee A: Yeah, I bet they could do that more, it'd be really neat.

Austin: It looks kind of gross.

Interviewee A: Yeah.

Jena: It definitely didn't smell good.

Interviewee A: Yeah, yeah, that stuff. Again, it'd just be made better I mean all the planting must be pretty grown up... Or you know I'm not speaking up there *gestures around head level*, but a couple of meters high, something like that?

Jena: Yeah.

Austin: What is your biggest complaint with the current flood prevention scheme?

Interviewee A: That it doesn't allow for the natural processes to occur. So the barrage gates are opened according to scientists and engineers. You know, and the sand bar's also you know, opened and closed at times. Due to those factors, like that, when you could be... well these guys *points at eel pamphlet*, they don't time in with that *referring to barrage gates opening and eel migration* and they're, you know, not critically endangered, but, we're trying just trying to get them on their way so they're expanding. As I've been involved... I've just finished being involved in a project where we were catching glass eel, the little guys, and samples that were

taken out and taken to a university, I'm saying, but I don't know the numbers, they say out of a hundred glass eels caught, maybe only ten were longfins, you know those guys that are endangered. That's coming straight in off the ocean. So we're worried about them in you know, the little water ways. The problem would be that they can't get out. These samples are showing, nothing really conclusive, but ummm yeah, even with the little ones, the numbers are really low.

Austin: So aside from the problems, I guess, what are the advantages of the current flood prevention scheme?

Interviewee A: Oh, just that it helps to protect several towns, several townships, yup, a lot of people's property, some reserves, some important reserves there, yeah and some species. Which are good things.

Austin: What do you know about the barrage gate resource consent?

Interviewee A: Not very much, cause I know they have to tune it... Yeah, Horipo and Russell would know, they probably know it pretty well.

Austin: So basically the resource consent for the barrage gates is up for renewal in 2019, so I mean I guess that's kind of what we're doing is starting that process by like gathering the opinions of everybody, so they can put together a good application for it. So, how could the barrage gates be operated in the future to suit the needs of this iwi?

Interviewee A: Oh yes, it seems we need to do something to do with the water quality, but, again, the fish. It's we need some kind of regime that helps the fish to get by.

Austin: So like, a better fish passage? Or?

Interviewee A: Or the timing, but the problem with that is you know how they don't, you can say that they all come in between July and November, like the juveniles, but they don't. You've got to be there to see and then to know what's happening and if there's a whole bunch of them there in November, that means you need someone to go and open them up, whether it's done remotely. So maybe it's more of a passage type thing. Yeah.

Austin: What do you think would be a reasonable compromise between the people whose land the gates are protecting and the people who want to see more environmentally friendly operation of the gates?

Interviewee A: I don't know too many people who are prepared to give up their land. You know, they might be prepared to change some of their practices, but yeah, I don't know. That's not really a good answer is it... Yeah a compromise?... No

Jena: Like what do you think would be a fair compromise between the landowners that want the gates to be there and want them to stop the flooding and stuff like that and the more natural flow you were talking about?

Interviewee A: Yeah, I don't know. I really don't know. I might think of it...

Jena: If you think of something just let us know.

Austin: If there was one thing you would like to see going forward, what would it be?

Interviewee A: I'd like to see that thing with the fish. Yeah, the fish and the rubbish that collects down by the gates. I mean I don't know, somebody might be down there, grabbing it you know. I've seen it a bit and hear that yeah, there's quite regularly a whole lot of rubbish.

Austin: So that's kind of, Jena do you have any other questions?

Jena: What do you think of the Ramsar status?

Interviewee A: Oh is that for the lake?

Jena: Yeah the wetlands are internationally... yeah.

Interviewee A: Yeah, that's good. I've read it, but that was a few years ago. I think it was on the wetlands... Oh yup yup, good. Again, because there isn't that many, you know that thing about the Wellington region where we've lost money of recent, that stuff. So whatever's left that can be expanded is a good thing.

Austin: I guess we don't have any more questions, but I guess this is kind of an opportunity to... do you have anything else you want to just kind of tell us about as it pertains to Wairarapa Moana and the barrage gates or whatever? Anything?

Interviewee A: Yeah, thinking of it, like I said I go down there, not that often, and so my perspective is a little bit remote. I think I only... I think there's only a few more families and they might not be involved with iwi, that actually are there everyday, and that's...

Jena: And why do you think that is?

Interviewee A: They just don't live there. If you live by somewhere, you be more involved there. Yeah, I think that's an interesting perspective, maybe some people down around Featherston or Parinua, the marae...

Austin: I know the other team that's with us is tasked with interviewing all the Kahununu, so I think they're interviewing a lot of people down there. Because most of the Rangitāne are located more near Masterton, right? Or they're everywhere?

Interviewee A: No, I guess that's what I'm saying is that even the people that are ancestrally from down there, that actually live in Masterton, yeah and they want it as much as I do. Or, they're more closely... Their families are more closely related because they are from down there, than here.

Jena: So are you saying there are people down there?

Interviewee A: Yeah, yeah yeah, there are, that's what I mean there's...

Jena: Do you want to give us their, like do you know their names?

Interviewee A: Just my families that are down there. Ummm... Hami's family, the other team they'll be talking to Hami. So he's got family down there.

Jena: Are there any Rangitāne down there?

Interviewee A: Ummm, well, gee that depends how you look at it. Most people their geneology, they have lines from three to four different iwi ancestors. But they will usually talk about, yeah just one tribe they belong to. But their ancestry is more than that though.

Austin: A lot of shared...

Interviewee A: Intermarried... interlinked. And that's what I mean this guy Mari Kara. Yeah there was the one in the 1800s that was sort of the main person and sort of said, oh I have a stake in Wairarapa Moana. And he said that he got his land through a man a few centuries before called te faka mana. You know so I can say that I'm a shareholder in Wairarapa Moana trust. *technical difficulties, missed 20 seconds* I'm more comfortable talking about around here because that's where I live, that's what I know and that. In Castlepoint, I've always gone to it...

Jena: We actually went there, not last night, but the night before.

Interviewee A: Yeah yeah, it's the place to be. No, yeah so Hami's family, they might pick up on that. There's a gentleman in Featherston called Dick Smith, he's not from either of the iwi, but he's lived there a long time. He's an ex high ranking soldier and public servant. He said that he *inaudible* that you used to in the streams down there. Yeah, that's the kind of thing that I mean, that's the kind of first hand that's really really important. That neat perspective from living just at the top of that.

Jena: Well that's all we have.

Austin: Yeah that's all the questions we have prepared.

Interviewee A: Was I a good resource for you?

Austin + Jena: Yes, thank you.

B. Interviewee B and Interviewee C

Natalie: The first question, so we will ask both of you, is what is your occupation?

Interviewee B: Right, Environmental Department. I work in for the Rangitāne and also I'm the Department of Conservation DoC spokesperson. I look, if any plans in that are coming, I just go wherever. I've also just started a new position here as of Monday, an alternate education worker. Working with children 13, 14, 15 that are loud at school. Children that have issues at home, they don't want to go to school... that's 20 hours a week here and I do 20 hours on the environmental side of it. Yeah, so that's, that's me.

Interviewee C: I am the advisor for iwi. There are two iwis that I think you might know of. They got their views and we got our views, so don't get confused you know and don't try to combine them all. We can be very radical towards one another now and then regional plans, resource consents, a lot of meetings, and that kind of thing. We also, me and Russell started our fishing company. DoC also has a fishing company as well. I do a lot of cultural stuff, and so lot of low tapu our land claims here in Wairarapa, and I do a lot of research with a lot of people. Any Māori environment is like you don't have one job, you have ten or twenty jobs and that's why we are active. Financially, we are not sound, we do a lot of government funding or contact to get the funding carry on so we can't afford a lot of people and that's what we do. I have about four or five different jobs, but that why ... to free our people, to feed our iwi, put my grandkids in that its easier for us to say hello to people because I don't remember your name or yours, and we know we're New Zealand we know we are Māori but so, that's me.

Interviewee B: Can I just add to that, I've got it all written down here. We also do Masterton district council with their sewage, they have a lot of problems with their sewage at the moment, at their new sewage sight so me and Horopo attend a lot of meetings to do with that. Also both of us for the Greater Wellington Regional Council on concepts and plans and RMA advice. We are on the fisheries board, Rangitāne, both attend the leadership forum ,and there's a new one just starting up, it's the forum group, just started up and also the Wairarapa Moana Committee and on the governance of the patui committee.

Natalie: Yeah, we were at the coordinating committee meeting last week.

Interviewee B: The one down in Featherston? Is that the one where all the farmers drift, the farmers, yes, sadly its true? So it is true?

Natalie: Yeah, it was quite surprising.

Interviewee B: Yeah, we heard about it yesterday.

Natalie: Yeah, because we were just sitting there like, oh look, this will be a nice meeting to learn about the community, and then everyone was just like, we are resigning, and we were like huh, okay.

Interviewee C: Well, the farmers are like us. We want to see things done, not this question done more of time and wait a couple of years before anything is actually done and we also deal with a lot of district councils, all the district councils, there's three district councils, but we also deal with "Harae" which is north of us. So there are two regional councils and about four district councils, that's who we deal with, but we don't talk for Wellington, on the west coast, we don't talk for any of them. From the Ruamataka and Tararoa hills, east of that. That's our area and that's all we talk for, our rivers and all that. Tthat's our side, we don't talk for the west side. Even though we are all close we are all first cousins, second cousins somewhere along the line, but that's there side and that's is our side.

Interviewee B: We usually meet once every three months, don't we?

Interviewee C: Yeah

Interviewee B: You know, that side over there, the iwis over that side. We go to Wellington between everybody to sort of see how the areas are going, what's happening in the area and where.

Natalie: The next question is, where do you live? City and region. And how long have you lived there?

Interviewee B: I've lived here all my life. Apart from, I think it was, when I was a young boy, and now I've been here, possibly, sixty years. Yeah, normal kids were brought up here and grandkids, yep.

Interviewee C: Yeah, I'm the same, born and bred here. Haven't moved nowhere. I'm not liable to move anywhere. Yeah, so I'm just the same.

Interviewee B: I was brought up at a place where my marae is. It's called tiki village, everyone knows it as tiki village and yeah, that's where I was brought up.

Natalie: Can you describe your role in your iwi?

Interviewee B: Like I said, we're in environmental. If any issues come up with rivers and etc, we go to meetings, both us. And ah, that's one of the roles, you know, attending meetings, public meetings, you know, just committee meetings. How many committees you on? He's on heaps of committees. And then, like myself just started a new one, part of the alternate education thing which is, I'm just trying to get my head around it.

Interviewee C: Well, I do what Russell does but on the land claims- I also go to those meetings. They are very important to me. And the board meetings, I go to those meetings. Yeah, as a staff member to report to the board, I have a lot of argument with them as well. Yeah, I like debating.

Natalie: How do the Rangitāne culturally value Wairarapa Moana?

Interviewee C: We were here 200 years before Kuhungunu. We were villagers right around the water bed at that time. It was all Rangitāne. As time went past, Kuhungunu migrated down and we just wanted to inter-marry one another, you know, but in respect to the Wairarapa Moana, we are still part of Wairarapa Moana. When Kuhungunu, after kahunun migrated we gave them part of Wairarapa but they took Wairarapa as a whole area we know as Wairarapa today, and we were given Wairarapa was only the lake, because that was our hard term, the lake, but as people get older they tend to spend and buy land... [inaudible] So today even those we are very close, we still have our debates and we have Kuhungunu ki Wairarapa, main word says ki that is the main word. Why is it the main word? Because it says our visitors, the o is for all...[inaudible] Even though Kuhungunu has 19,000 or 20,000, they are still visitors here. Even though we might have eight or nine thousand, we are from here we are people of the land and that's the difference. But the government doesn't understand that, but that's the way it is.

Natalie: Do you have anything else to add?

Interviewee B: I think he said it all mainly really... Sometimes we have our ups and downs.

Interviewee C: Keeping one another honest.

Interviewee B: Yeah keeping one, yeah, keeping it honest, each other honest.

Interviewee C: Yep, keeping it honest if something wrong.

Natalie: What do you value most about Wairarapa Moana? Why?

Interviewee B: The people, yep.

Interviewee C: In the past it would be variable, but today not some much because of the pollution. I suppose you went to the spillway Oparoa spillway? Did you smell it?

Jeff: Yep.

Interviewee C: Did you see the water or see any flow in the water?

Jeff: It was stagnant.

Interviewee C: It was stagnated, aye. It was polluted, yeah. That river used to flush that lake out. Now nothing flushes that lake out. So we can go in there and have a look for Kakahi, which is a fresh water mussel, there are a lot there... [inaudible] ... the Kakahi are just like any shellfish it cleans the water but there's just too much pollution in it after all these years. That water used to be clean as, but now a times farmers let their cows in there. So today, it's a big headache especially in order to clean it. We get it back and the Crown is going to tell us to clean it up because every lake that I know that has been handed back to Māori they have been told to clean it up. So they [inaudible] from day one and we have to clean it up after 150, 170 years, so today it's a big headache. The farmers changed some of the wetlands for farming. Not the farmers. The Crown let the farmers do that.. [inaudible]... The barrage gates is a structure that blocks our fish ways, that destroyed our fish factory we could have had down there that's for our tuna and everything. It was brilliant. We just trade with people up north or on the west coast. We used to trade our eels for fish fruit and everything like that. We can't do that now. Once our fish come here, we are doing a feasibility study on eels on the tuna because you don't want the tuna coming

from that way because the barrage gate blocks it [inaudible] it closes when the baby eels come up. They migrate for two days that's half of that and half of that [inaudible] because they got the trout, karp, catfish all eating them and you've got obstructions like the water wears and barrage gates the dams... the eels will live in the beautiful, clean...[inaudible] they won't migrate. That's the longfin... to us the lake was a beautiful place and it still is, but today it's a big headache. Just trying to clean it up and get our wetlands back.

Interviewee B: Yeah, we have a role to protect and restore the Māori of the moana. Iwi provided less on cultural values and ensure that they are on to restoration. That's how I see it.

Natalie: So the next question, how does Wairarapa Moana provide for your needs?

Interviewee C: To me not much really, maybe the wetlands around it the raupo and all that... The eels, fish, birds, raupo, yeah there a lot of plants good for medical reasons. Today, not so much. If you look at the longfin eel on the west coast it's a whole lot cleaner... eels are quite good to fish you'll find you will find the eels on the edges and the exotic fish in the middle. To us, or to me, I don't use much down there. I'll go down and do a survey and do some monitoring. Like as I said before it's dirty.

Interviewee B: You can't swim in there anymore. Too dirty to swim anymore, aye. The bottom of the lake is just mud and you can't see eels, Horipo said eels, flounders, mussels, most of it's by feel. And yeah it's just too dirty the water.

Natalie: How is the Wairarapa Moana used recreationally by the Rangitāne?

Interviewee C: Not really. Not that I know. There is whitebaiting [inaudible] ... jet skies, but for Rangitāne itself.

Interviewee B: I know no one goes there for swimming.

Natalie: So mainly fishing.

Interviewee B: Yeah, a lot of people go around with nets, you know, you know Māori people hardly ever do that.

Natalie: How are the native fish important to the Rangitāne?

Interviewee B: They are in a way because our eels eat them they are a source of food. But then again years ago someone introduced trout to our rivers it is an introduced species by the ways and I can say then the trout eat the eels the little babies.

Interviewee C: All native fish are very sacred and still sacred today. [inaudible] but overtime, its very hard to do a couple [inaudible] kakahi is like rocky bottom [inaudible] ... the Patua committee they the water quality and quantity they got to put it into a regional plan. We always seem to be on the bottom, yet the river starts up at the north here {inaudible}... so we don't know how scientists can think they can solve this problem. [Inaudible]... we start at the top, we clean the top, and it will flow down... [inaudible] so you clean the top... [inaudible] and it will follow all the way down.

Interviewee B: The native fish are there, but they getting very scarce because you know the state of the water the river and the creeks.

Interviewee C: Well the longfin ... [inaudible] the fresh water kouras, we rarely eat those as well.

Interviewee B: We used to, like I said. I was born out there in the village there in the creek there there used to hundreds of them but now theres nothing

Interviewee C: Whitebaits got so many different species of it like the kokopu are very there just about extinguished just about extinct... [inaudible] Got to preserve the water preserve preserve the water that's [inaudible] because scientists or people will monitor the water and they don't monitor the slime on the rocks and that's where the pollution occurs. The fish live in and amongst those rocks they don't live in the top of the water they live in the rocks and what they are eating... [inaudible] in the old days, it used to be all native treasure on our rivers now there is hardly any native treasure.

Interviewee B: Yeah, mostly willows. When we were kids we used to go eeling once a week at least once a week on the weekend and there were heaps of eels. You know, but now, they are getting scarce.

Interviewee C: Even though we talk about up here and our rivers and whatever up here [inaudible]

Interviewee B: But you know it affects the eels everywhere doesn't it, but that also all goes to the lake it all goes to the lake... [inaudible] see a few people whitebaiting, but that's all about it or you might see some people using rods down by Onoke spit, which is right by the sea and the lake and the opening. You might see one or two people down there. Yyou might one or two people fishing, but down there is very dangerous.

How is water culturally important to the Rangitāne and how does the quality of water affect this?

Interviewee B: The water is crap down there.

Interviewee C: There is a great great implication of water.

Interviewee B: And I suppose everything is like years ago. I don't know. It never used to be dirty like that when the river was flowing into it and flushing it. From what I heard, it used to be nice and clear, but now, I mean culturally, to answer your question, it's done a lot of damage.

Interviewee C: Yeah it's damaged a lot... [inaudible] Even that the lake wasn't that clean, but at least it was still flushing.

Interviewee B: Yeah, it was getting flushed there.

Interviewee C: Yeah the lake is not getting flushed and we get the sediments and all that that go along the banks they harden up overtime and overtime that land is getting smaller and smaller. I think its called supertrophic water or whatever. I don't know what you mean by that, but to me it's really bad [inaudible]...and that's what they are saying. And some of the scientists are saying they shouldn't have said that... [inaudible] yeah, and then we go for this so called Ramsar, which is an international thing for water and all that. How can you go there when you have supertrophic water? You know, how can you go there? We are clean, green New Zealand.

Interviewee B: But culturally I think it has affected our people quite. Definitely on the food source side of it. I'm not saying I would, but I don't think I'd eat anything out of there, myself.

Interviewee C: You got to have a look at not just the lake but everything that goes into the lake. The Ruamahanga is one of our main rivers that goes all the way to Lake Onoke. Wairarapa used to but not anymore, and everything in all the streams most streams in the Wairarapa valley go into the Ruamahanga so you got all the crap in that all going down to one place. If you had to look at some of the rivers now, you'll see all that crap along the beach and you'll see in one flood it's all gone. You have to contact your regional council and say where did it go to? Oh, it went downstream. The only place it will actually go is the lake. ... [inaudible] so the next dry winter we have or next dry spell we have, all the farmers or whoever it is I can't blame the farmers only [inaudible] wineries all their land runoff will go into the water and we will have the same mess again. So we are not actually cleaning that because in the Māori world, when the river floods, it cleans it. The rivers are the main blood veins... [inaudible] to us. You got all your blood veins in you... [inaudible] its washing your body out and that's what a flood is like in our world... even though we try to look after it the best we can, but we have people that are hungry for more money, and money, and money. That's what happens. Everything is not built around money.

Interviewee B: Yeah, the local and regional council have got a lot to answer for and also local farmers. They have a lot to answer for I think, what's happening to it, that's my view.

Interviewee C: There's a couple of things ... [inaudible] ... they actually brought it out and said farmers could reduce their stock. And that was one quite nice, but there are farmers that want more, and more, and more, and more nutrient and all that and that goes on to the land and they try stopping us. We have a drought and the government will go there and help the farmers get out of the drought, you have a flood and the government will go there and help them get out of it. But we are urban people and they give us nothing. So the farmers are getting all the help they can from everyone.

Natalie: What do you know about flooding in Lake Wairarapa? It's more of a broad question to see how you would answer it.

Interviewee C: It's more about the old days mainly because in the old days when it floods it would flood all the farmland. The farmlands I showed you about, where the lake used to be, that's what it was in those days.

Interviewee B: And where the spillway is, that's overflow isn't it.

Interviewee C: Yep, but the spillway floods quite often- fish and everywhere... In the old days it used to flood the whole land. That's when the Māori used to lay all the traps for the fish to catch the fish, put a little channel so the eels would come that way and they were into export fish and all that, but when the colonial people came in and wanted more, and more land and that's what happened. They started draining it and the earthquake in 1855 that lifted the land up a bit, but that's mainly it because here Lake Wairarapa floods to...[inaudible] the whole river floods not just the lake. You look at mamba... [inaudible] and that really floods.

Interviewee B: Cause when it floods, that's when they open the spillway, I mean the barrage gates.

Interviewee C: They wanted to change the Ruamahanga to Lake Onoke for flood protection. You get all those waterways just by the lake and you get those people clean those lakes out and you get all the eels...[inaudible] so that's a lot of hassles, but its all about flood protection in those days.

Natalie: Do you think flooding is a major issue in the region? Or do you think flooding is well managed?

Interviewee C: I don't think it's a major issue. It all depends how Wellington Regional Council engineers think it is. At the moment the regional council flood department has caused more flooding than anything that's my opinion because what they have done is taken...[inaudible] the river is flat...[inaudible] now you get extra water coming in where's it going to go. It's going to go to the sides there's nothing to top it. If you have a channel the water will go straight down the channel and that's...[inaudible] but you keep flattening the rivers and... [inaudible] see the council only model things aye, they did modeling and do it how they are supposed to, but they put up stop banks in the wrong places. They have done that a few times and it's a waste of money. So even though they think they got it right, they maybe have it wrong because no one can control water. You got the big damns but ... [inaudible] you get one crack and it will blow. You watch that tsunami in japan last year wiped it out... [inaudible]

Interviewee B: Does that answer your question?

Natalie: Yeah, I think so. What do you think of the current lake water levels?

Interviewee C: Shocking. During summer it's shocking. We all know this. Even they know this. When they tell you its full irrigated, its not because they are talking about ...[inaudible] what we believe is if you say this is fully irrigated area then it means some are not fully irrigated that's what it means. Another thing I learned at school is that there are different interpretations today when I talk about fully allocated, I mean fully allocated. When I hear about consents and something about people taking more water, I say wait a minute that area is fully allocated. They say, oh, it's supplementary now and I'm like, oh my god. They're contradictory ...[inaudible]

Interviewee B: I think they tend to look more after the farmers than talk about the water... [inaudible] Farmers want more water, oh we will give them the water. So they tend to instead of listen to us.

Interviewee C: We've had our own Māori scientist. He did most of the ...[inaudible] he came back with a strong recommendation. The council should look at and they never looked at it, they put it to the side and left it. [inaudible] ...There [], sorry if im getting off track, but the [] stands for water... [inaudible] Our same scientist put a cultural report in and all the council could say was that it was a not bad view point. That viewpoint is our culture. That's what we believe in...[inaudible] and that's what they're all like even though it's about working together, its crap. We get a memorandum partnership and a memorandum of understanding. A memorandum of understanding means nothing because in order to understand what they're doing and that's it. Memorandum partnership, there's only one partner and that's the council so, where's the partnership? So we are not only fighting trying to get the Wairarapa the best we can, we got to fight with the bureaucrats around it. That's why ... [inaudible] we have to look at the bigger world. We can't just look at Lake Wairarapa or Lake Onoke.

Interviewee B: You can't understand what he's talking about ... [inaudible] we haven't gotten many signers.

Interviewee C: But the scientists or the European scientists, they don't understand the Māori world. ...[inaudible] ... they have never learned our ways so we still have a long way to go.

Natalie: What are your views on irrigation in the region?

Interviewee B: I don't mind taking enough to do what they got to do, but that's just getting to the stage now where I think they are just over doing it. It's just green now. That's my own view.

Interviewee C: There's not many water take on the Wairarapa Moana actually. I don't know maybe in time.

Interviewee B: When we went down there we saw all the sprinklers going.

Interviewee C: Mainly from ... or surface waters, but there are a couple of irrigation dams coming up. I don't think there is that much irrigation down in the Wairarapa because in the ... [inaudible] try to take water out of Wairarapa Moana or Onoke... [inaudible] they've been going at it for the last eight, nine years ... [inaudible] too much water going out for other people because they take the water for their wetlands as well and like I said, our lake will get smaller and smaller.

Natalie: What is your opinion on the current status of the wetlands?

Interviewee C: I think you need to ask the farmers themselves because we actually don't know the current status of the wetlands. In the summer we know it's dry as all these workers are construction workers... yeah, I think you need to ask the farmers because we really don't know go to the wetlands as much as we would like to.

Interviewee B: I know thinking of doing a lot of work with the wetlands. You know, DOC does a lot of work with the wetlands around the moana the lake with new signs and signage. Many people know the different birds in the area and stuff like that.

Natalie: So Ramsar was already brought up. We have a question, what is your opinion on the Ramsar status? You already gave a little bit of information, but is there anything else you'd like to say?

Interviewee C: Not really. There are two things, barrage gates need to be removed and Ruamahanga needs to be reinstated. The Ruamahanga needs to be instated to the Wairarapa Moana and the barrage gates need to be taken out.

Interviewee B: Open up the flood gates and join the Ruamahanga River back to the lake.

Interviewee C: I have been saying that for a long time.

Interviewee B: He gets sick of saying that to Ian Gunn, its just like a joke now.

Interviewee C: I hope he comes in and joins us. He's a brilliant man, Ian. My question to you guys is what are you hoping to get out of this?

Natalie: Well we are hoping that from all the different interviews we want to know basically all the information we can about how people feel about the situation... So we are just trying to find similarities and point them out to the GWRC so that they can use the information... and with the report we were planning on sending it to anyone who is interested... so we have to give a presentation to our sponsor and our advisors... so if you'd like to attend that it will be somewhere around the first Tuesday or Thursday in March...

Jeff: So we hope the report will be a document that all stakeholders can use to learn about other perspective and views about other people.

Interviewee C: Yeah, we don't mind you doing that but we want your honest opinion because the regional council has done a lot have done a lot of work on our rules but when the report comes out it has been condensed down and we don't want that.

Jeff: Yeah, we are fully transcribing each interview. So you can look and see word for word what you said.

Interviewee C: Because we did, about four years ago, two Victoria university students. Our honest opinions there were about six of us, they came back with two, but when they come back with the final it was totally different. We know that regional council checks them over and I know that... [inaudible] I want your honest opininon, I don't care as long as its your opinion...[inaudible] after awhile you can tell how the regional council sets things up and writes reports.

Interviewee B: There's no doubt they will go through what's been written, is that right?

Natalie: So actually this report is being submitted through our school, published through our school, so most likely they won't have a hand in it before you see it.

Interviewee B: Oh good, we just don't want them saying 'oh you can't write that down, you can't put that down.'

Natalie: I can't imagine that happening. And obviously for our report we have to summarize our findings and like **Jeff** said, we will have full transcripts of all the interviews so this report will be around 100 to 200 plus pages.

At this point two side conversations began and lasted for approximately two minutes and the interview resumed after a break.

Natalie: What are your thoughts on the current state of the wildlife in Wairarapa Moana?

Interviewee C: Wildlife in Wairarapa Moana that's mainly the birds isn't it not so much the fish. What's it called the Canadian geese and all that.

Interviewee B: From what I've been told the birds side of it they have been flourishing down there from the birds' side of it.

Interviewee C: The Canadian geese are flourishing and we know they kill them off every year so many.

Interviewee B: Yeah, and I know they are. I was talking I can't remember now who it was, but one of the DOC reps was saying that the stocks...[inaudible] so and they're flourishing down there.

Natalie: Do you know how the fish have been affected by the flood prevention scheme, any additional information you'd like to share?

Interviewee C: Like [inaudible] and talk about our natives. Introduced fish are killing our natives. Aberration is killing our natives. Fish and Game are protecting karp- is it karp or is it trout? They're protecting karp, I think

Interviewee B: It's what they introduced to Hindi lake.

Interviewee C: They grow to like a big size. It's like a goldfish. Its like a big size and they use it for recreation and that. That's in the lake already, cat fish is in the lake. If you look at original

documents there are supposed to be no introduced fish in our lake, but they need to take that out its too late now, but that's why our fish and eels and all that I think that's [inaudible]

Interviewee B: We've heard nothing to say that they're not dying off in big numbers so obviously they're doing alright. Like you say we don't have much to do with the lake really do we.

Interviewee C: Yeah, well we don't have nothing to do with the fish. There's no fish, there's no commercial fisherman in there now. I lied on that one, there's wasn't supposed to be any commercial fishing happening there, but since the lake is so big it's happening. They can't get to them cause they can go all ways and if the farmers would clean their drains out then they would know how much fish is in there, but all they do is just dump it on the beach.

Natalie: What should be done to mitigate the negative effects of the gates on the fish?

Interviewee B: You're talking about the barrage gates.

Natalie: Yeah

Interviewee C: The barrage gates are mainly for controlling the lake levels. Make it rise or make it drop.

Interviewee B: I don't think that's going to have much of an effect on the fish, is it, aye?

Interviewee C: Yes, it does because the fish can't migrate. They have got a little fish passage for them, but it's not working. If you go down to the barrage gates and torch it at night you will see all kinds of fish hanging out. So that's the main thing I suppose. In the farming world or the community world its helping protect the farms but in our fish world we just ...[inaudible]

Natalie: Do you have any things you would like to see done about the gates or how the gates affect the fish, anything in particular?

Interviewee C: The governors group, the Wairarapa's governors group, I think they need to have a full discussion on this. That's my personal view, I think take...[inaudible] that will help our fish ... [inaudible] because we are trying to do a feasibility on our baby fish to full adult fish and

maybe future ...[inaudible] maybe but the longfin eel which is really native ... [inaudible] grows here, but the shortfin eel we get rid of we will ...[inaudible] so I want to give more, what do you call it ... [inaudible], of those up the stream for our fisherman like **Joe** to catch so we can study them better because ... [inaudible] trying to keep them alive is the hardest part.

Interviewee B: Because I reckon in the old days when they used to open the lake up to the sea they used to ... [inaudible] be thick with eels because the migrations, but I reckon you don't see that now, aye

Interviewee C: No, it has been depleted by that much, they're nearly extinct.

Interviewee B: But I suppose the barrage gates don't help because they can't get out

Interviewee C: No, but a lot of eels won't bother ...[inaudible] too many have drowned too many structures in the way. They don't migrate at all.

Natalie: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee C: No, not really.

Interviewee B: Conservation do you mean, what does it mean? Improvements?

Natalie: Yeah, trying to preserve the wildlife in the region and I don't know the different ecological efforts.

Interviewee B: The only thing I can think of is what DOC is doing with signage and that but at least the public know. In this area that's the birdlife you know and in this area that's the eels and the mussels and all the different signage. That's all big bright new signs now, aye. They're excellent.

Natalie: Do you think there is a need for more anti-pollution measures to be taken? Please specify.

Interviewee C: Education would be the main one.

Interviewee B: I reckon they should put in a big machine to suck all the rubbish off the bottom. A dredge, yeah.

Interviewee C: That could make it worse, too.

Interviewee B: That could make it worse, could make it dirtier. I don't know the answer to that yeah.

Interviewee C: It's about educating people, I think that's the main thing. That's the biggest.

Interviewee B: Educating people, are you talking about farmers?

Interviewee C: Anyone, yeah, not only farmers ... [inaudible].

Natalie: What is your opinion on the Lower Wairarapa Valley Development Scheme?

Interviewee C: Yeah, that's another flood control ... [inaudible]

Natalie: So that's the entirety of the cutoff, the diversion, and the barrage gates, and also the stopbanks. So all of that development to control flooding is part of that scheme.

Interviewee C: So it's more structures than anything. It's mainly for flood protection and it's a waste of time because it's the same things that the farmers ... [inaudible]. Its all about farmers.

Interviewee B: It's all about farmers yep.

Natalie: What do you think about the management of the Barrage Gates?

Interviewee B: Not opened enough.

Natalie: Say if it were impossible to remove them and they had to stay, what would you like to see done with the barrage gates?

Interviewee C: Barrage gates, if we can't get rid of it they need, the barrage gates should be open at all times during the migration of the eels, in and out because the eels will migrate in and sit there for so long and right when just about to have their babies they will migrate back out because once they have their babies they do off. So during the migration in and the migration

out they need the barrage gates need to be open at all times and its not only the barrage gates, but the sea needs to be open at all times too. Yeah, because.

Natalie: So you'd like to see the Lake Onoke spit open more?

Interviewee C: Yep, that's it. That needs to be open at all times during migration as well.

Natalie: Because I think what we were told usually when it does block they usually try pretty quickly to open it again.

Interviewee C: Yep. I think they just open it when they feel like.

Interviewee B: Yeah, ... [inaudible] they have to wait for the water to build up behind the sand to flush it out.

Interviewee C: It all has to do with the level, once the level gets to a certain point, they dig a trench. I can understand that because we talk to [inaudible] ... about that and that's why the lake level gets so high ...[inaudible] got to look at how much water is being taken out cause you look at the old days there wasn't much in the irrigation in those days so a lot more water would be going out. Now these days a lot more water is being taken out of the rivers. ... [inaudible]

Interviewee B: Yeah because I think farmers used to milk their cows by hands and not by machinery. They wouldn't of had many, I think.

Interviewee C: Yeah, irrigation was lighter, too.

Natalie: How does the operation of the gates affect your daily life?

Interviewee B: It doesn't for me.

Interviewee C: Personally no, but if I was a fish it would.

Natalie: How do you feel about the Ruamahanga cutoff?

Interviewee C: Hahaha. It is what do you call it. Farmers, some farmers want the cutoff to be back in place they want the Ruamahanga to go back. There are one or two that doesn't want it because it will flood. They crack me up because things haven't changed that much it doesn't that

much floods down there anyway. Me personally, I want the Ruamahanga back into Lake Wairarapa to flush... so yeah, put it back.

Interviewee B: You've been saying that for years.

Natalie: If it had to remain as was, for whatever reason is there anything for the actual cutoff that you would like to see done. Like say, pumping water into in I think we've heard of that. If it had to remain cutoff what would you like to see done with the cutoff.

Interviewee B: You mean its got to be

Natalie: Yeah, so right now its cutoff from both the lake and the river and if nothing could be done about the way it is right now. I'm speaking hypothetically, I don't know what they are planning on doing what would you like to be seen done with anyway to treat the water or make it better?

Jeff: What would you like to see if anything done with the cutoff besides bringing it back. So if it still remained in place what would you like to see done?

Interviewee B: So if it stayed there as is what would we like to see done.

Interviewee C: Its alright if you don't have anything on the top of you're head.

Interviewee B: I don't know. We have always said that we would like to see it moving the water so the water is moving because at the moment the only time the water moves is when the wind blowing you know what I mean.

Interviewee C: Yeah, they're talking about turning it over and they're talking about enhancing the water, but when you see something like that there is no enhancing. Nothing. By time they do something about it... [inaudible] On the west side of the territory the lake on that side that can't be dredged after all these years it can't be dredged. It's just ...[inaudible] going to be the same

Interviewee B: Its so polluted and we are reminded we are lucky because our sewage doesn't go into there. [inaudible] ... the only sewage that goes into there is what come out of the back end of a cow that. Yeah, we are lucky really.

Interviewee C: No not really because cross creek featherstonship they still put it into the lake.

Interviewee B: There sewage goes into the lake. Oh I didn't know that.

Interviewee C: And todo niko, those are the two streams that go into the lake. But the Ruamahanga ... [inaudible] so they're still a lot of crap from everyone going in

Interviewee B: But I think what they're saying is if they can't ... [inaudible] I'd like to see something done where the water is moving because at the moment it is just pretty stagnant.

Natalie: What is your biggest complaint with the current flood prevention scheme?

Interviewee B: I suppose they don't open the gates enough.

Interviewee C: Yeah, that'd be the main one.

Interviewee B: Or long enough, yeah.

Natalie: What advantages are there with the current flood prevention scheme?

Interviewee B: The only positives I see are with the farmers. They are getting the benefit.

Interviewee C: We talk about the benefit to the farmers and the farmers talk about the benefit to the community. More jobs and so on... [inaudible] which is crap.

Natalie: What do you know about the barrage gates resource consent expires in 2019?

Interviewee B: I didn't even know about that till I read your little. Did you know about that.

Interviewee C: The barrage gates, yeah.

Interviewee B: Oh you knew, I didn't know.

Natalie: So currently what they are trying to do the resource consent for just the barrage gates expires in 2019 and the resource consent for the entire scheme expires in 2025. So I think they are potentially, this is still up in the air, go for a short term and then sync it up. That is one of the options people have said. If not they are going to try to go for a long term one.

Jeff: So they are looking to a 35 year resource consent in 2025. So a short term 6 year resource consent to sync it up with the Lower Wairarapa Valley Development Scheme resource consent so at 2025 they can apply for both resource consents in 2025.

Natalie: Is there anything regarding the resource consent you would like to see changed, like length of term or anything regarding how that is handled.

Interviewee B: The only thing I would like to see is to get that lake moving, get that water moving that is what I would like to see.

Interviewee C: In the cutoff and the oparua spillway.

Interviewee B: We have to get rid of that make the lake look attractive. At the moment it looks bloody terrible.

Natalie: What do you think would be a reasonable compromise regarding the barrage gates?

Interviewee B: A reasonable compromise. Take them out. No. I don't know.

Interviewee C: They've had it there for long enough and that's what we missed out on. ...[inaudible] they took our fishing life away so did they think of a compromise then. No, I would have thought about

Interviewee C: They weren't thinking of iwi then they weren't fishing about our fishing rights. Yeah, they destroyed our fishing rights because ... [inaudible] the fishing rights were so huge and that was destroyed within a couple years. So everything is about the economy I suppose and not the environment and that is the saddest thing.

Natalie: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee C: There's only one thing and that is to clean the water of our lake up but to do that we always said you have to clean the top up

Interviewee B: It starts up there

Interviewee C: And finishes down there. The three district councils Masterton, South Wairarapa and Greytown, all their crap goes in Wairarapa ...[inaudible] so fencing the lake off would help because you still see a lot of stock going down to the lake. So it would be great to see those things.

Natalie: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures? So its like a catch all anything that you'd like to mention that we have missed.

Interviewee B: The first time I've been around the lake with him. It's just the drive around it you know the beauty of it, it's a beautiful place, but, you know, you look at all the greenery, then you look out that way, and you see the dirty color of the lake and I can't imagine what visitors and people from overseas say. Of course, they got all this beautiful greenery, but then they got all that crap over there and that's why I'd like to see them tidy it up. So that's my personal view.

Interviewee C: Try to bring it back to what the lands were

C. Interviewee D

Jeff: What is your occupation?

Interviewee D: Cultural advisor/ Kaumatua, do you want me to translate what Kaumatua? It's kind of like elder like- I kinda speak on behalf of the families here. Kaumatua literally translated means elder, even though I'm not old.

Jeff: Where do you live (city and region)?

Interviewee D: Here in Masterton.

Jeff: How long have you lived in the Wairarapa region?

Interviewee D: 54 years

Jeff: Can you describe your role in your iwi?

Interviewee D: I look after all the cultural aspects of our people here, so anything to do with Māori custom, Māori protocol. My roll is to make sure it's done properly. My roll is to guide people through, to teach it to the next generation pass it on. Yeah, those sorts of things.

Jeff: What do you value most about Wairarapa Moana? Why?

Interviewee D: Its history, the story of how it came to be and what it means to us as the local people of the area and the stories have been handed down through the generations. Yeah, all those things.

Jeff: How do the Rangitāne culturally value Wairarapa Moana?

Interviewee D: Again, very similar, the stories that are passed on to each degree, they help us understand the way the environment works, and the stories that help us understand what our ancestors did. The stories that help us pave the way for the next generation. For Rangitāne, our people is- our history, our genealogy is all tied up – Wairarapa Moana, certainly not Wairarapa Moana exclusively- has a huge significance in terms of the connections we are able to make, in this area.

Jeff: How is water culturally important to the Rangitāne and how does the quality of water affect this?

Interviewee D: Water has a unique quality as far as our culture is concerned; it's a very spiritual thing, and every ritual we have, in some form or fashion, water plays a part. So, and it plays a part in terms of, I suppose the- it's almost like a cleansing effect that it has,, but not just cleanliness as far as when we wash our hands or anything like that is concerned, but also cleanliness from a spiritual sense. So you'll find whenever we have rituals, towards the end of the ritual or even at the end of the ritual, then water is often sprinkled over ourselves or whatever it is we are – the ritual is for, and that way the water acts as a way of removing what's called tapu, and tapu from a cultural perspective is-. One thing about tapu is that it's been misinterpreted over the years. So when the early settlers arrived, our language was translated by the early missionaries, and trying to find English equivalents to some of the words that we had, they'd often use their own knowledge of what their words meant and tried to compare them to ours, so words like tapu were often, and still are, often seen translated as to mean sacred, whereas it doesn't really mean sacred. There's an aspect of sacredness around it, the word tapu,, but there's a number of ways we translate tapu and it all depends on the context in which the word is used. So we consider the head to be tapu, the head of a person to be tapu. The reason we consider that to be tapu because it contains all the knowledge that you have. So that's the tapu, and you know that's not sacred. It's you know, you got to [share] your knowledge with other people and with your children etc. Things that we wear when we have greenstone, I don't know if you've seen some of the greenstones that people wear. There's a tapu associated with those greenstones, but it's not that kind of tapu that's so sacred that nobody can touch it, because then you wouldn't hand it down to the next generation. So the tapu that I believe is associated with things like greenstone and other taunga, precious things, yeah that we have as the personal thing that belongs to somebody, so we shouldn't be touching things unless of course we're given permission to do that. Tapu is also used as a way of warning off people from danger, so traditionally our old people would say to children "Don't go to that place it's tapu" and of course that sort of immediately stopped them from going there because they associated it with being not a safe place to be. But the tapu, that was often associated was just that it was dangerous to be there, and you didn't know what was going to [fish you, bring you]- A lot of our iwi were coastal iwi, and so you know there's a lot of dangerous places out in the coast, so often there were tapu

places, that were often called tapu just because they were dangerous. [So deep mini pools], sacred sort of thing, just because it was dangerous to be there. That's sort of, and that just to answer the question again- and that's why we use water. At the end of the ceremony we lift- we use the water to lift the tapu, to cleanse. Yeah tapu, lots of meanings. This is, that's tapu, because it's unique, because it's the only one we know that's what, tapu has all those different types of meanings. The thing is that it has been misinterpreted, often over the last 50 years, its just been used to mean sacred so a lot of people are often scared of the word tapu now, today's day and age and as soon as they hear it they're all "don't go there", you won't go onto that subject about tapu or anything. There's just misinformation, that's all, about the word. It certainly has a lot more meanings than what it's made out to be, and one of the things I believe is because it's associated with the word tabu, because it sounds so familiar and so often when the people hear "that's tapu", [oh, they think] "they tabu" and so tabu, "don't go there" sort of thing.

Jeff: What do you think contributes to the poor water quality in Wairarapa Moana?

Interviewee D: There's lots of things, pollution is certainly the key, the main thing. But I also think overfishing; those sorts of things have done that. I'm no expert on you know ecology and environmental stuff but I certainly know that, you know. When I was little, our rivers were full of [crawlies] and crayfish, you know the little- and other little fish as well and now there's nothing so you know they told me as I was growing up that something was happening to our water to our rivers, because that's basically where I lived, which was just east of here. The river just flowed out the back of our house so of course we'd go down there and go swimming all the time, and we just noticed that they got less and less and less, and then, now you don't see them at all. So we knew something was happening, to the water, and of course the levels were getting lower and lower too. So all those different things, that I suppose that we have done to make life better for us, have sort of not made it good for our rivers.

Jeff: Do you think flooding is a major issue in the region?

Interviewee D: I don't, because you don't often hear about it, you know, not as, not like some other places, where just about every winter, you know you hear about a flood there. I think Maunganui is one of the places where we always, just about every winter here about a specific

place in that area that's been flooded and flooded to the extent that you know people have had to move out and evacuate and all that sort of stuff. You very rarely hear that here.

Jeff: Is flooding well-managed?

Interviewee D: I think so, yeah.

Jeff: What do you think of the current lake water levels?

Interviewee D: Probably not up to speed with some of those details and stuff. I think it's certainly gone down over the years, but I would be more concerned about the sort of- the way the lake is looking in terms of its color. I don't know what you'd call it, but it seems to be a lot more, muddier than usual.

Jeff: Would you like to see the Lake Water levels change? If so, how?

Interviewee D: oh yeah, absolutely. I think lots of things would probably be good to see change, and that's only going to happen when people's attitudes start to change about the importance of the lake and what it can mean for future generations. We got 40-50 years, you know my generation, 40-50 years of pretty good relationships, good connections with our lakes and our rivers. But I can't see that happening for the next generation. Not like we have. Like I said, we went down swimming all the time, we went down the lake fishing all the time, we did all of those things, but my grandchildren probably won't be doing that stuff. That's because of the quality of the water and the way the river's- the levels have gone down and stuff like that. Although some of them still go up into the mountains for a swim now, which is the best place to go [at this stage].

Jeff: What are your thoughts on the current state of the wildlife in Wairarapa Moana?

Interviewee D: Again, probably not too up to speed too much with that. I would think that hopefully Dane and Russell, did you ask these questions of everybody? Hopefully Dane and Russell were able to answer that question. They could certainly answer it a lot better than I could. Again, like everything else, wildlife around the area, not just the lake, but all around has depleted, especially the birdlife. Some of the stories we have here, about what the birdlife used to be like here, where we had just about all species of birds and other creatures here in the

Wairarapa, but has sense you know been depleted, so we've had to bring in those species from other areas. Just an example in Mount Bruce now, we've brought in kiwi, we've brought in kokako, just to replenish the life that's been depleting over the years and that would be true to around the wairarapa moana as well. Yeah, the Wildlife has certainly gone down. I think that would be very much thing with the tuna too, the local tuna you know that's really depleted, from what I've been hearing, especially the longfin tuna which was in our creeks and our rivers and our lake was full of those at one time, but not anymore.

Jeff: Do you know how the fish have been affected by the flood prevention scheme?

Interviewee D: No I don't, I'm not sure how that works. I would suggest you know, that one of the things that I've heard at the different gatherings that I've been to in my roll as Kaumatua, and hearing about some of the practices that are in place in different areas, in terms of flood protection, in terms of damming and all that sort of stuff, that it certainly has an effect on the life in the water, the life in the lakes and in the rivers. When the fish and the eels go upstream and they come across a dam that's it, that's as far as they go, whereas they could get all the way up into the mountains, and back again out to the sea. Now those sorts of cycles have changed for them, and so with change you know that's affected the way they breed, all that sort of stuff.

Jeff: What is your opinion on the Lower Wairarapa Valley Development Scheme?

Interviewee D: I think it's a great initiative. I think it probably was needed a bit earlier than now, but it's something that's happening now, and so people are starting to see that things need to be done as far as our Moana is concerned and our other waterways and bringing back our wetlands, all those sorts of things, and how hugely important that is to the environment., especially ensuring that it's there for future generations. I think it's a great thing.

Jeff: What do you think about the management of the Barrage Gates?

Interviewee D: Again, probably not the best person to answer that question. And hopefully Dane and Russell were able to give a response to that, because I don't really have a lot to do with the people who manage that area.

Jeff: What is your biggest complaint with the current flood prevention scheme?

Interviewee D: Again, probably not enough knowledge yet to kind of, sort of make any comments of any great-

Jena: Can we maybe reword that question into what do you think, as the region is right now, culturally, what is the most infringing aspect of it as it pertains to flood protection?

Interviewee D: I think from a cultural perspective it really it's just about – I suppose the best way for me to answer that question is to give you an idea of how iwi see the water ways, what they mean to us. So, my elders, most of what I know has been handed down by elders, so I've been privileged to sit beside 80 year olds, 90 year olds, and for them to pass on their knowledge. Our ancestors saw the world as the name they- we use is *Papatūānuku*. So *Papatūānuku*, from a cultural perspective is the earth mother, and their learnings, all of the water ways were almost like her veins. And so they were the -what kept her alive and thriving. What ensured that her cloak of green, all the rest, was always looked after and cared for. So from their perspective or from our perspective, today, from a cultural perspective anything that is put in place to hinder those veins, to stop the lifeblood running through them, affects us culturally. And so it's a little bit difficult to give a view on that from the perspective of what's happening today, but that gives you an idea on how we see it. I can recall one of the main people that I often sat with was a man with the name of [uncle kuki]. We'd often go for walks down the river, and he would tell me about what his father and his father's father would go down there. So the river was a source of lots of things the water in the river was used. They bless all the children down there. It was used to cleanse any spiritual hurt that was going on. It was used for any other physical hurt as well. It was used for entertainment; it was used for swimming and all those sorts of things. So it was a very important part of their lives and that's changed only in the last fifty years, I would say. Whereas we don't do that anymore. We don't take our kids down there to baptize them. We don't go down there a lot any more to use the water in the river to- for ritual purposes. Now of course, now we take it out of the tap, but of course by going down the river and doing it, and taking the children and grandchildren down there, that was all part of a teaching thing, and because that's not happening any more, it's not getting passed on, it's not getting handed down. So of course, all the other things that are happening around rivers, the fencing off of places, which 100 years ago, you could go just about anywhere, any part of the river but now you can't without climb fences or go through gates and all those sorts of things.

Jeff: What part of your culture are you worried about that might be lost?

Interviewee D: Well look, I think we've gone through some status here in the Wairarapa, and we're- I wouldn't say it's the same everywhere else too, but here in the Wairarapa we have gone through some status. In the early 1900's we were very conscious that we didn't have a lot of speakers of our language and we were afraid we were going to lose our language. Now when you lose a language, that's a grief you've lost your language, the culture won't survive. So up until the 1940's there weren't a lot of Māori speakers here. We got a bit, an influx, of other iwi who come into the area who were fluent speakers of Māori and they married into some of our people here, so were lucky in that sense, that we did have people who spoke Māori, although they weren't from here, they still carried the language and so that kind of helped us keep it going for the time being. It wasn't until the 1980's that the Kōhanga Reo was established, and so our language started to flourish again. Kōhanga Reo is an early childhood learning that is done completely in Te Reo Māori. And then, of course, with Kōhanga Reo there was kura kaupapa which is our Primary school education, again done in the Māori language, and then they went on to [whatakuai], which is the secondary phase of that, and then of course we have or wanin established around the country. So we were afraid that we were going to lose the language, and of course if you lose you language then everything else goes. Probably at this time because our language has flourished, we've given it a more- another burst of energy, our tikanga has started to flourish, our customs have started to benefit from that as well. Again, we were a bit worried about out customs and stuff being lost. One of the things that I suppose right now we're -the biggest thing that we're worried about is our stories, yes, we have a lot of stories. The people who told those stories aren't with us anymore. See one of the things about our stories is that they weren't written down. Our stories were often passed on orally so people would just sit around, and you'd have the old people talking and telling the stories that way, and stories were captured in some of the, you see the meeting houses there in those photographs, they were captured in the carvings, that's how our stories were told, as well, through the carvings, that adorn some of those houses. But they weren't written and it wasn't until the early 1900's that people started recording things. We have managed to find to sort of find manuscripts and stuff that have been written by some of our ancestors that have been put up in people's attacks and put away in people's rooms and stuff and 60 years later somebody's found them and then the go "oh aren't these so and so's diary" or whatever, written in Māori, and her telling the story of a particular area. We have

managed to gather some of those things, but there is still a lot that we haven't and that's what we're going through right now as part of my role too, is to try to bring back some of those stories.

Jeff: Are you aware that the barrage gates resource consent expires in 2019?

Interviewee D: I don't know anything, sorry.

[We explain basics about our project and the basic details about the Barrage Gate Resource Consent- I think there was some confusion about what the interviewee interpreted as the Lower Wairarapa Valley Development Scheme.]

Jeff: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee D: Probably just ensuring that as they move forward that they take us with them, and not - History tells us that often we're in the back somewhere and often when something goes wrong then we're called upon. We'd rather be there beside them when they move forward, in whatever form that may be. And I think that's already started to happen with some of the different groups and organizations and committees that have been developed over the years and the relationship that we now have with the Greater Wellington Regional Council is a lot better than it was 10, 20 years ago, so that's always good, but there's always room for improvement like anything, relationships need to grow. It hasn't always been a good relationship and we're just starting to figure out who's who and all that sort of stuff here in Wairarapa. And we've- Iwi themselves have gone through finding out who we are and all that sort of stuff over the last 20, 25 years or so through the terms of the treaty claims and stuff. But we've been through that now and we're going to start- and we really want to move forward with some of the stuff, and it would be really good if we could move forward together and having the right people in place is always good and so that's starting to happen now. We have people that are passionate and knowledgeable and the areas that we need the knowledge and all those sorts of things. If anything it's just about moving forward together because that's what I think everybody wants.

Jeff: Do you have anything else you'd like to tell us about your tribe, Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee D: Well I don't know, probably just from a Rangitāne Wairarapa perspective in terms of our connection and our history around, certainly the lake but Wairarapa, the all of Wairarapa and all of the waterways, are concerned. I think people often tend to dismiss some of the [] that iwi have around these sorts of things but we have 600-800 years of history here in all of Wairarapa. A lot of it is just starting to be put into the public domain, and- Over the last 30 years the two iwi have been on a path of discovery in themselves, as I mentioned earlier, and we're just starting to build up our resources and our ability to do what we've always wanted to do and have often been unable to do it because of different reasons. We're sort of moving into an area now where we can, we can fulfill what our grandfathers, our fathers foresaw as our future and I believe that's important. Not just for Māori, but the whole Wairarapa community and especially for our upcoming generations. Water is absolutely important to Māori []- our lakes and our rivers as I mentioned earlier are the veins of our mother and that's from the perspective that our ancestors saw the environment, that's absolutely key in everything we do. Whenever we talk about tekuna custom protocol, it's always the fall of our thinking that anything we have to do with the waters, the rivers, the lake, it's all about our mother *Papatūānuku* and we have to treat her in that sense. And some people find that difficult to comprehend and difficult to connect you know with how we'd been working in today's society. But I believe there's always ways, there will always be a way of working through it, and it's just a matter of sitting down and talking and finding that way. What we've had to put up with, I suppose, in the past, and it hasn't happened, people will say I don't think we'll just go ahead and do what we want to do, but that doesn't happen anymore. And that's because the relationship has grown. There's always can be better but with time. So Rangitāne as far as our area is concerned are keen to make sure that what we hand down to our grandchildren is something worth handing down, and not to be ashamed of. Which, I'm sure all of us want.

E.2 Department of Conservation

A. Interviewee E

Austin: What's your job title?

Interviewee E: ... I'm what they call a rec and historic ranger for DoC. Recreation is the 'rec' piece. I used to be a bio ranger back in the day. Now, I look after more of the backcountry hikes and tracks, that's my main job. I do get asked effective of being here for so long ... I get asked about all sorts of questions 'How to get from A to B', 'How to access places', etc. etc.

Austin: How long have you lived in the Wairarapa region?

Interviewee E: Nearly all my life, I suppose... I came back in 1974 from the west coast from the south island. I've been here ever since. Prior to that I was born in Hawkes Bay... We moved to Greytown in 1964... I've spent the last five years working here in the Wairarapa. I was a ranger down on the coast from 1974 from 1999 and I moved to Masterton in May 1999.

Austin: What do you personally value most about Wairarapa Moana?

Interviewee E: Good question... It's probably... I mean its going to be always a really muddy sort of lake because that's the nature of it because theres silt and that it gets washed down the rivers and years and years gone by. It probably was a lot clearer than it is now because of all the farms and the land being cleared so there's more silt going down the river system... I value, not so much the lake itself... I value the reserves... JK Donald which is a big reserve on the Eastern side which is a lot of little lakes ponds and things where it's got a really good habitat for bird life. And that's mainly all that eastern side has got a little ponds... like Boggy Pond and Matthews Lagoon and that's a really good bird habitat. The birds like Britton and Heron and stuff like that.

Austin: What do you think the value of Wairarapa Moana is to DOC?

Interviewee E: I think any big waterway or river system are pretty important, not only to DOC, but to other people too. You know I've often said to ... in years to come ... water is going to be worth more than gold. We're running out of good water. It's getting polluted... by various

things... I know in Caneberry people complained about their water because of things like dairy farming and poor quality water reaching into the water system.

Ausitn: How do you think Wairarapa Moana provides for the communities needs?

Interviewee E: The community is probably more the farming community. A lot of the swamps on the eastern side were ... forty years ago they were all sort of the habitat for birds and I know for a fact that a lot of the swamps down in there were drained and cleared and turned to grass, turned to farm. I guess the farming community have been the main ones that benefit from things like the Barrage Gates and the Oporua flooding because they used to get massive floods in there years ago before they put it in... You do see a lot of recreation and things going on there like boats and yachts and things but it's so shallow it makes that sort of tricky. You can literally stand up... in the middle of the lake... that's just from silt... especially on the eastern side because the wind blows and builds up sand dunes and stuff.

Austin: How does change in flooding patterns affect wildlife in the region?

Interviewee E: I guess they're pretty used to it now... Years ago they used to get huge floods that would've affected nests and habitat and things like that. Probably the scheme and the barrage gates and cutoff... the wildlife and birds have gotten used to it... It probably doesn't affect them quite as much. We still do get the occasional big flood now and again... especially if it's in the nesting time [it will affect them].

Austin: So the flooding is pretty detrimental to the birds then?

Interviewee E: Oh yeah, it must affect them alright.

Austin: So, do you think flooding is a major issue in the region?

Interviewee E: I don't think it's a major issue... with the barrage gates and things like that it has improved... they don't get the major floods like they used to... at the Oporua... You can tell from looking from the road... I don't think they've had a flood through there in a long time... You used to see all the debris on the fence... They wouldn't want to flood there it would wash all of the hay away... I don't remember when that road was closed... the Oporua spillway... It used to flood through there for quite a number of years and it does normally close the road.

Austin: Do you think the flooding is well managed by the regional council?

Interviewee E: Yeah, I think they do a good job.

Austin: What do you think of the current water levels in the lake?

Interviewee E: They go up and down when the mouth is closed... It doesn't really affect us a lot... It affects the farmers down there more than it does us... The regional council is usually pretty good they keep the mouth open if they know theres a big rain coming...

Austin: ... can you elaborate on the state of the water quality?

Interviewee E: I don't know much about it... the Ruamahanga River... the water is getting... it's not fit to drink... I know a lot of farmers now are planting up... Quite a lot of people looking for farms are probably more inclined to buy a farm that's got all the waterway fenced and planted with trees whereas in the old days you cleared everything and every bit of grass was pretty valuable. Nowadays people changed their way of thought and it's good to have shelter built and trees planted with you know dams and water riverways that flow into the main water system... There was a heart surgeon... what drew him to buy the farm was the bush in the back of the farm... if they didn't have the bush he might have gone elsewhere to someplace that had the bush... I know lots of farms with areas hard to musk or whatever and they fence it off and plant it up with native trees... which is a big turn around from nearly 40 years ago when people were cutting bush down to make more pasture... Even with the bee thing... Menuca seedlings... in the old days... a lot of farms cutting it down... anyway that's quite an interesting turn full circle.

Austin: What are your views on irrigation in the region?

Interviewee E: Down in Canenbury... the irrigation systems are so big... even around here they're getting big... not as big as in canenbury... I think in some cases in needs to be on a smaller scale... a lot of farms are putting a lot of chemicals on grass and ground and in the water and the irrigations leach into the water systems and probably in some cases it's the very water they're using to irrigate. It's just going around in that cycle right there. I'm not 100% sure about that though, but I think some irrigation... we managed in the old days but the only trouble now a

lot of these dairy farms who got big herds... 1000 cows... that's what's putting the pressure on... getting the grass to grow. In the olden days my father always had a dairy farm and he had 60 to 80 cows and he did pretty well then.

Austin: What's your opinion on the current status of the wetlands?

Interviewee E: That's what I talked about before, Boggy Pond and ... I think we need them... They're probably lucky that they never got drained because there's quite a few drains that run around... To drain all of that land... Quite a lot of that land is nearly under sea level... Very low lying land... I think we need to keep the water levels for the wetlands there... On the western side I can remember years ago going down there... well most of that land on the left of the road heading south was all swamp, flax and cabbage trees... Back then, deer used to actually live in there, it was quite a wilderness, now it's all paddock... Especially further down towards ocean beach... Yeah I think its very important that we preserve our wetlands, they're slowly getting less and less from farms and people draining and that stuff.

Austin: What do you know about the Ramsar status of the lake?

Interviewee E: Nothing... They are trying to get that put at the lake aren't they? ... But no I don't know...

Austin: Can you explain what the conservation efforts are currently regarding Lake Wairarapa?

Interviewee E: I think it's a combined effort of local community farmers and district council and regional council are all sort of joined together to make it a better place... I suppose you wouldn't have heard about the eels and trout... There's the freshwater mussel too...

Austin: Do you think there's a need for anti-pollution measures to be taken?

Interviewee E: Oh yeah... Like I said before we all need to play a part in that... *inaudible* ... I mean we've all got a part to play... Water is going to be more valuable than gold

Austin: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee E: ... I can remember as a kid when it was done... I know they did a lot of work with the old drag lines... they sort of shoveled it out...

Austin: So what do you know about the operation of the barrage gates?

Interviewee E: Not a lot... I know they open them up at times to let water out and close them down... but yeah I don't know much about that.

Austin: You worked with Lake Onoke... Were you involved with the digger operations down there?

Interviewee E: No... they used to use bull dozers... more recently they use a digger.

Austin: So how does the operation of the barrage gates have an impact on DoC activities?

Interviewee E: ... it doesn't really have any impact really.

Austin: How are fish important to the Department of Conservation?

Interviewee E: Native fish are, probably not trout though, trout are considered the possums of the waterway... native fish, we're definitely interested in native trout... well there's pest fish that are in the lake like goldfish and carp and things like that... not good really because they compete for food with the native fish.

Austin: How are the native fish affected by the barrage gates?

Interviewee E: I think there's room for them to get through there... There's a fish passage I'm pretty sure, I don't think it's a major problem. We see giant Kokopou up here in some of the smaller streams which means the whitebait... they can obviously get up the river systems...

Austin: What do you know about the resource consent renewal for the barrage gates?

Interviewee E: Not a lot

Austin: How do you think things could be better operated in the future to better suit the regions needs?

Interviewee E: I think fencing the lake off from stock... cattle... So I think yeah, it's pretty important to keep stock out of the water. The biggest problem is that the lake goes up and down quite a bit is keeping the fence... you know you have to do quite a bit of maintenance?

Austin: Does stock commonly go in the water?

Interviewee E: You know this time of the year they probably do... But most farms are getting pretty on board with fencing the lake off.

Austin: What do you know about the Ruamahanga Cutoff?

Interviewee E: Oh Ed Handyside... Yeah we've been involved with the planting at the edge of that farms down there... That's looking really good now because DoC has been helping plant... There was a lot of pest fish in there too and I'm not 100% sure but I think someone's trying to catch them and trying to get rid of them... I think that's somebody's job to catch the pest fish and not the native fish.

Austin: So what are the environmental impacts of the river being cutoff?

Interviewee E: I think probably the main one... although the fish can still get down where the narrows is (that's what they used to call it, the narrows)... I guess it probably them a little bit... it helps the fish reach the sea, the ones that come in because they don't have to come into the bottom lake and come through where the barrage gates are and go into the other lake, they just have to go straight... it just makes an easier passage you know... and it's been there that long now the new channel is probably not much different from the original channel anyway... you know vegetation and along the sides and you know... probably when it started there wouldn't have been any weed or any vegetation.

Austin: What are the overall advantages of the flood protection scheme?

Interviewee E: If I was a farmer, I'd say that the big advantage is for farming in the area... That was one of the main reasons they did that to open up more farms in the region... more land for farms to use and there would be less floods.

Austin: What are some of the disadvantages of the flood prevention scheme?

Interviewee E: The bird life has lost a lot of habitat I guess especially on that western side, but when Boggy and Matthews and JK Donald reserved a lot of the habitat on the eastern side... I think Brittons is one bird you don't see down there much now, years ago you used to see a lot of Brittons, they are a pretty shy bird you know... Now it's a big event if you see one...

Austin: So if there is one thing you would like to see going forward what would it be?

Interviewee E: Probably... Fencing off the entire water system... the hills all through the waterways and then you wouldn't have any cow [feces] into the water, but that's probably a big ask, because some farms are just not... some farmers are really good. Just fencing off the entire lake and leaving enough riparian strip around the edge so that it could sort of revegetate from bird life... If the lake level rises five meters, the fences you get driftwood and stuff tangled up... but it would be good to fence it off probably a hundred meters back from the lake edge at a normal level... I won't see it in my lifetime I don't think.

Austin: Do you have anything else to tell us about?

Interviewee E: No, not really... I'm not an expert on the lake or anything... I have been around quite a while...

Austin: Thank you very much we really appreciate it.

Interviewee E: No problem

B. Interviewee F

Jena: What is your occupation?

Interviewee F: Biodiveristy ranger with the Department of Conservation.

Jena: Where do you live?

Interviewee F: I live in Featherston.

Jena: How long have you lived there?

Interviewee F: I've probably lived there for about five years now.

Jena: Can you describe your role in Department of Conservation?

Interviewee F: I mostly coordinate operations on the ground and mostly related to the Wairarapa Moana wetland complex. I do a little bit of organizing contractors and reporting up to the management team and mapping. Just making sure operations on the ground happen really. Bit of planning, and doing what needs to be done.

Jena: What do you value most about Wairarapa Moana? Why?

Interviewee F: I don't know if there's something I value most. I think on a personal level I value the recreational opportunities. I use it a lot to walk the dog and I go take our kayak out. From a professional perspective, I think I probably value the diverse [ranks?] of threatened species. I can't remember the exact number but it's like about 30 or 40 rare or threatened species that use Wairarapa Moana. Lots of people don't realize that, they think it's just a big muddy lake. I think it's quite important and its (like) one of the last remaining wetlands in the region.

Jena: What is the importance of Wairarapa Moana to the DOC?

Interviewee F: I guess it would be the biodiversity values based on what DOC's objectives are. That would include the habitats and the threatened species that live there.

Jena: How does Wairarapa Moana provide for the community's needs?

Interviewee F: I think it provides flood protection measures in some ways because it (that's what we've learned to do it does that big sponge thing and) absorbs lots of water when there's flooding and then they let it go but more slowly rather than when So I think it provides that ecosystem services. I think it provides recreation opportunities although it's got a lot of development to be done. It provides some fishing, like I know people who catch flounder. Yeah, probably mostly recreation.

Jena: How does the flooding, or lack of flooding, affect the wildlife in the region?

Interviewee F: In theory flooding shouldn't affect the wildlife too much because they are all adapted to it. So in theory they might have a temporary impact on populations might blow out in an area, but they might come back, they'll probably come back. They're adapted to that sort of stuff. Lack of flooding, probably has more of an impact in many ways because it's a relatively unnatural state.

Jena: Do you think flooding is a major issue in the region?

Interviewee F: I think it probably isn't at the moment, but it wouldn't be without the flood protection scheme.

Jena: Is flooding well-managed?

Interviewee F: I think it probably is relatively well managed. There's quite a big stopbank network and things seem relatively under control.

Jena: What do you think of the current lake water levels?

Interviewee F: I guess I think they are good for lake-edge birds, they are good for a lot of the wading bird life there, but I'm not entirely sure if they are good for the natural functions of the wetlands, or for the fish life, and maybe more fluctuations would help there. I'm not sure about the turf communities either, so there's little plants that live on the edge of the lake, and I'm not sure how much they would be affected by the different lake levels.

Jena: Would you like to see water levels change? If so, how?

Interviewee F: I'm not sure. That's a really big question. I'm not sure if I could say yes, I want them higher or lower, like I don't think it's as simple as that, but I would like the lake levels, or the barrage gates and their impact on the lake levels to consider the aquatic life of the lake more... They've looked at the impact on the bird life quite in depth, but they haven't looked at the impact on fish... Want the lake levels to reflect the needs of the fish who use the lake.

Jena: Do you agree with current flood management or should it be changed?

Interviewee F: I'm not sure, I guess I'm happy to go with whatever science recommends is the best and I think that's such a complex question and there's quite a lot of work that needs to be done to understand what the best option is.

Jena: What is the state of the water quality in Lake Wairarapa?

Interviewee F: ... My general understanding is that it's relatively poor like its got high levels of sediment and it has got quite high levels of phosphorus. I think it's ok for Nitrogen. That's just my general understanding and may not reflect what is actually happening

Jena: How do the barrage gates affect water quality?

Interviewee F: I'm not sure, really.

Jena: How could the water quality be improved?

Interviewee F: ... It's not just the Barrage Gates it's the fact that the Ruamahanga's been diverted away from the lake. The Ruamahanga used to come in and it was water flowing through and out where the barrage gates are and I guess that's not happening anymore. So that may improve water quality, I'm not sure. I guess what the biggest thing you can do for water quality is look at the wider catchment and what's happening on the land around it. So it's much bigger than what the barrage gates are doing.

Jena: What are your views on irrigation in the region?

Interviewee F: Irrigation is obviously important for economic reasons. I think it's a real balancing act, and we should have total regulations, particularly around the Wairarapa Moana

wetlands on how much irrigation there is because of the nutrients flushed through the systems. Personally, I'm not sure if that would be a DOC answer but my personal opinion is that there should be more (total regulation...)

Jena: What is your opinion on the current status of the wetlands?

Interviewee F: They're pretty degraded and pretty modified like with all the stuff that's going on with the diversion of the Ruamahanga and things, but it's surprising how much natural biodiversity still exists there...

Jena: What would you like to see change?

Interviewee F: I'd like to see more work going into protecting and restoring them

Jena: What is your opinion on the Ramsar status?

Interviewee F: I think it will be valuable to get Ramsar status for the lake. It's a good marketing tool to use to get more funding.

Jena: Can you explain the conservation efforts regarding Lake Wairarapa?

Interviewee F: ... so there's a big aerial willow spraying operation, willows have invaded lots of the hedge wetlands. That's a big operation that's been going for, I don't know maybe ten years. Where we go in and spray a patch a willows and try to get rid of that willow canopy and bring back the natives. There's quite a lot of predator control that goes on along the edge wetlands. There's a lot of research that goes on. So there's regular bird surveys of the lake, there's been a few fish surveys and some research projects looking at how to control exotic fish to benefit native fish populations. There's been a bit of work that Anne's done looking at water quality, so diverting water through wetlands to try to get the wetlands to take out [] there's been restoration planting, there were bitten surveys?, there are various other weeds that are being controlled at different spots.

Jena: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee F: Yeah I do, I think its wider catchment stuff, working with farmers. I don't necessarily think it needs to be rules, but I think there's definitely a scope for improving the water that flows into the lake...

Jena: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee F: I know it was a really big and kind of ground breaking scheme when it was put in. It involved the division of the Ruamahanga, which is huge, installation of the floodgates. It destroyed a lot of wetlands, so areas down by lake Onoke that used to be wetland or that have all been stop banked and are now pumped and are now farmland... It was quite an impressive scheme. I was always seeing videos of them dredging...I think it's probably added economically to the region, because its made areas farmable that wouldn't have been before.

Jena: How does the operation of the gates affect daily life?

Interviewee F: I think it stops the flooding around the lake so it means that people with properties around the lake can continue to farm...

Jena: How do the gates affect the environment?

Interviewee F: We know that they stabilize the water levels so they're actually good for the wading bird populations and we know that they probably stop Fish passage. So migratory fish probably struggle to get into the lake. But we don't know a lot about what impacts they have on fish, there's been a lot of speculation that they have a really bad impact and other people have said 'oh it's not that bad.' There's a lot of science there that probably needs to be done

Jena: Does the operation of the barrage gates have any impact on DOC activities?

Interviewee F: ...It has an impact on how we manage the lake. So if they change water levels, we may do different types of monitoring. We may have more weed problems if they lowered the lake levels and have more weeds going out into the lake, possibly...

Jena: How are the fish important to DOC?

Interviewee F: The fish are important to DOC because we have an obligation to manage them under the conservation act, and a number of them are threatened species, they're nationally and regionally threatened....

Jena: Which fish species specifically (native fish)?

Interviewee F: In general we should be looking at ... fish communities, so it should be community fish rather than, because there's quite a few that are threatened they would probably always stand out, but in reality we should be managing the ecosystem in the community rather than just one.

Jena: How are they affected by the barrage gates?

Interviewee F: The barrage gates probably stop fish passage... they probably have an impact on the water levels in the edge wetlands... they may have an impact, well the whole scheme may have an impact on the amount of sediment in the lake and the nutrients that are in the lake. So not necessarily the barrage gates, but the diversion which is part of the development of the barrage gates.

Jena: How could you mitigate the negative effects on the fish caused by the barrage gates?

Interviewee F: I'm not sure, again I think there's a few research projects there that need to be done to get those answers, and there's fresh water scientists out there that would be better.

Jena: What do you know about the barrage gate resource consent renewal in 2019?

Interviewee F: I Just know that its coming up for renewal, and I guess I hope that we have a bit more knowledge now then we did 20 years ago, and it will consider a few more things and it will be a step forward in terms of the ecological management of the lake.

Jena: How could the barrage gates be operated in the future to suit the region's many environmental needs?

Interviewee F: I don't know, I think its one of those things again that needs a bit of research around it.

Jena: What do you think would be a reasonable compromise regarding the operation of the barrage gates?

Interviewee F: Again there are research projects and hopefully that will help us out with things.

Jena: What is your opinion about the Ruamahanga cut off?

Interviewee F: I guess I can see why you would need it for flood protection defenses, but I guess personally there's a big part of me that thinks it would be lovely to connect the river to the lake, how it used to work, whether that's feasible, if possible to do that and maintain flood protection defenses I'm not sure. I don't know enough about the flood protection stuff...

Jena: What are the environmental impacts of the river being cut off?

Interviewee F: ...In some ways there may be benefits at the moment in it being cut off because of all the nutrients that come down the Ruamahanga, so there may be less nutrients going into the lake. I guess there must be an element of flushing, if the river was going into the lake, and I think the connectivity as well, for the fish that move throughout the system, that's been cut off by the diversion.

Jena: Should anything be done about the water stagnation?

Interviewee F: Possibly, for the people who live there it's probably a bit unpleasant so it's probably worth doing something about it for the people who live there. It's probably not that high on my list of priorities...

Jena: What overall advantages are there with the Lower Wairarapa Valley Development Scheme?

Interviewee F: The overall advantages are that we manage flooding events and protect farmlands and towns ...there's quite a bit of access because there's lots of stop banks, which potentially for cycleways and things might be quite a good resource in the future.

Jena: What disadvantages are there with the Lower Wairarapa Valley Development Scheme?

Interviewee F: Probably the big changes to the wetlands, so the loss of wetland extents that happened initially, the changes in hydrological regimes within the wetlands so just the general modifications ecologically.

Jena: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee F: I think the roll of iwi probably needs to be considered. I'm not sure how much it was a part of the initial resource consent. I think because of the pending treaty settlement, which will send the lake back into iwi stewardship, I think the ideas of the iwi on where they want it to go should be considered probably first and foremost. I think there's a lot of science that could be done that would help inform it. Hopefully there's a lot more information around these days and that will help make it a better process, not that it was a bad process in the past, but there's always new information coming in.... basing decisions on actual knowledge rather than just perceptions.

Jena: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee F: I think just to continue funding the ecological restoration, and the community engagement and the recreation development. So I don't think it's anything new that were not doing now, just continuing it...

Jena: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee F: No, I don't think so.

C. Interviewee G

Natalie: Where do you live (city and region)?

Interviewee G: I live in Masterton, just outside of Masterton there's a place called Taueru, and I live there.

Natalie: How long have you lived in the Wairarapa region?

Interviewee G: 1 week, however I was born in Masterton as well, and I moved over to Palmerston North, which is just over the ranges and have recently moved back.

Natalie: What is your occupation?

Interviewee G: I'm a senior ranger, community. My roll is working alongside community, and that also includes the local tribes or iwi, and that's the majority of my roll, is working along side iwi, and specifically looking at treaty settlements, and resource consenting.

Natalie: What do you value most about Wairarapa Moana? Why?

Interviewee G: Wairarapa Moana has a great significance to me personally, but I also belong to the local tribe, one of them, Rangitāne and so it has significance for me in terms of our historical association with the lake and from many, many years ago, so apparently a good estimate, it's a good 500-700 years ago, one of my ancestors, and many others, we're in this area, and he was quite prominent and so he named that lake. And so yeah there's significance to me that that's always been a prominent feature. Beyond that and moving into conservation it's also prominent in terms of- for me and for a lot of Māori, water bodies hold a significance in terms of health. The health of people. It's our water bodies that show us how healthy we are, as people. I think for me that's probably the primary purpose of water bodies. They give us a good indication of how healthy we are as a nation. Now I don't know if you know the state of Lake Wairarapa, and if you look at the data you'll see it's not in a good way. Which to us gives us a sign or a signal that maybe things need to change. We're not in a good way. Now, I don't want to harp on about this, but a lot of that was caused, or the causation of it was around the process of colonization, and in particular assimilation into a western style of living. =water quality, caused by colonization to western style of living.

Natalie: What is the importance of Wairarapa Moana to the DoC?

Interviewee G: It's very important to the department I guess, quite like iwi actually; I can use iwi can I? Quite like the iwi, the department has a vested interest I guess in its natural habitats. Iwi are similar but I think iwi are more, are also interested in the spiritual element of those habitats, and the historical element of those habitats. The department though, I've enjoyed my short time here, because there are people here who are very passionate about the environment. They may not know so much about the history or the cultural values associated with it, but they are hands down passionate about the environment and keeping it up to speed.

Natalie: How does Wairarapa Moana provide for the community's needs?

Interviewee G: Well in this point in time, I don't think it does. I don't think it's in a good state, and like I said it's more of a barometer for where the community is at and in particular for iwi.

Natalie: How does the flooding, or lack of flooding, affect the wildlife in the region?

Interviewee G: I wouldn't have a clue. Well I kind of do but I wouldn't be able to give you anything that's in depth, technical.

Natalie: Do you think flooding is a major issue in the region?

Interviewee G: I think it's always been an issue in the region, but it seems to be that that's a natural part of how things may have worked, so other things in the region have changed hence, yeah, it's changed down at the lake.

Natalie: Is flooding well-managed?

Interviewee G: I don't think so.

Natalie: Do you agree with current flood management or should it be changed?

Interviewee G: I definitely think we need to work on flood management around Lake Wairarapa. I definitely think that management needs to consider the different iwi perspectives, hence I'm glad you're meeting with both iwi. Yeah, that's about it.

Natalie: What is the state of the water quality in Lake Wairarapa?

Interviewee G: Highly degraded.

Natalie: What are your views on irrigation in the region?

Interviewee G: Well that's managed by regional council, well I just I feel again there might be a lack of consultation with local iwi around irrigation. Also I think consideration for the future isn't always, I guess, top priority. It's always here and now. So that can be a cause for concern, as well.

Natalie: What is your opinion on the current status of the wetlands?

Interviewee G: Well actually we graze our wetlands. I'm happy that our new natural resource plan, coming out of Greater Wellington provides, I guess, stronger rules around wetlands. We're also doing a project with them, (DOC), around the wetlands as well, dealing with this coast and also the other side of the Tararuas. So that should also be, I guess, a point of discussion between us and council and iwi, which will be good. It means more emphasis on wetlands.

Natalie: What would you like to see change?

Interviewee G: More emphasis, build them up.

Natalie: What is your opinion on the Ramsar status?

Interviewee G: So Ramsar status, they're still working on that?

Jena: For Ramsar status, Lake Wairarapa fulfills seven out of the nine requirements, one of them is a naturally flowing system, and I think that isn't fulfilled so that's one of the points of discussion going on between basically everyone, maybe not everyone, but it was brought up.

Natalie: We went to a Wairarapa Moana Coordinating Committee and they talked about Ramsar a lot.

Interviewee G: I mean we have those on the other side of the island too around Manawatu Estuary as a Ramsar site. I mean it would be great to have that sort of authority over that area. I know the iwi would be in favor of that, and just it provides some type of protection.

Natalie: Can you explain the conservation efforts regarding Lake Wairarapa?

Interviewee G: Yeah, we do some spraying in there. Well what worries me is that how far has the lake gone. We have limited resources. I know this sounds like a line I'm trotting out, but it's the facts. And we can only use them where we are going to get net benefit. It's a big issue and it needs a concerted effort and resource. If it doesn't get that, I don't know how'd you approach it.

Natalie: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee G: Definitely, but the measures are not just around the lake, it's everything upstream, it's everything right up into the hills. Definitely and your generic measures around riparian planting and not allowing cattle access into streams etc. They need to happen, they would possibly have an effect over time.

Natalie: How are the fish important to DoC?

Interviewee G: We have obligations to ensure that freshwater is maintained in a way the fish habitat is maintained. Yeah and down there it speaks for itself, it's highly degraded and so I don't know if it's a great habitat. I don't know the ins and the outs though, there's other people here that definitely know, firsthand. At what they do about operating all those habitats, I don't know.

Natalie: Which fish species specifically (native fish)?

Interviewee G: I think it has more of an impact on native fish, and exotic fish, but I'm not too sure

Natalie: What do you know about the Barrage Gate resource consent renewal in 2019?

Interviewee G: Nothing, it will come across my desk at some stage because both iwi will be settling claims, historical treaty claims. I'll have a part to play in that and this will be a part of that process.

Natalie: What do you know about the Ruamahanga cut off?

Interviewee G: Nothing, so the cutoff, describe that to me.

Natalie: So the water system used to flow through the Ruamahnaga into Lake Wairarapa and then back down through another portion of the river out through Lake Onoke.

Interviewee G: And is that optimal?

Natalie: That was in the 70's.

Jena: Yeah, that's the natural way that it was supposed to flow

Interviewee G: And is that the optimal way or not?

Jena: Optimal in what way?

Interviewee G: Optimal in terms of the habitat. In terms of the river.

Natalie: I don't really know if we know enough about that to either say yes or no.

Jena: Potentially yes, I think the way that it used to work was potentially better for the habitat, but they also say that the current lake levels are better for the birds, so I think there are plusses and minuses.

Natalie: Currently, instead of flowing into Lake Wairarapa, it goes through a diversion that they created and the water, the second portion that would have flown out is cut off from both the lake and the river. So the water is completely stagnant unless there's like rain and its bright green because there's no flow whatsoever and there's different issues associated with that.

Interviewee G: Does it become a good, and this as you know my knowledge is nothing, but does it become a good site for measuring nutrient levels, since it doesn't flow?

Jena: Since it doesn't flow potentially yes, but since it doesn't flow it probably wouldn't reflect the nutrient level of the rest of the lake.

Natalie: Yeah it's not attached to the lake currently. The lake itself is more stagnant than, I mean there is some flow in and out but it used to be 100% of the river would go through the lake and now 97% of it is diverted.

Interviewee G: Is that why the lake is the way it is? Part of the reason?

Jena: yeah there are a lot of different factors that go into it, we talked to Ian and what they're trying to figure out is like where everything is coming from and why its so degraded. There's a lot of aspects that play into it.

Natalie: There are a lot of different reasons why the lake is the way it is. The barrage gates themselves control the amount of water in the lake, and then there's also the opening of the lake Onoke spit. It's all related.

Natalie: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee G: For starters, co-management, the Wairarapa the bed of it is going to be given back to both iwi. That has huge implications for managing it into the future. There needs to be a long term, obviously, plan set in place, about how they restore Lake Wairarapa. That plan needs to consider not only the environmental values but cultural values out of the tribal feedback. More of what I'd like to see is that it's a tourist destination. That it's- that people use the lake, that the lake can be used for food, that the lake can be used for industry, that the lake can be used for recreation. That's what I like to see.

Natalie: Stimulating the economy in a different way other than farming.

Interviewee G: Definitely.

Natalie: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee G: No, well actually there is one thing I will leave you with. Lake Wairarapa was named Wairarpa, which means: "Wai" is water, "rarapa" is falling. Apparently when their ancestor looked at it, he was sitting up on those mountains, and he looked down on it and the glistening of the sun got in his eyes, and the water started to water, his eyes were watering and that's why he called it Wairarapa. Now these are real people, ok, and that's what I love is that, what he did by calling that land that name to this day is he put a stake in the sand really, because that was the point of naming thing, so that then his ancestors, you know the people after him know that they are connected to that place. That's what I think is important. And it's funny that

my colleagues who are not necessarily connected that far back, remembering that we have a very young history, we're a young nation so the pakeha, what you call pakeha or non Māori. They also have a connection, which is why I bring up Garry Foster. I mean, when he talks about that lake, he knows way more than I'll ever know. And I'm just like wow; it's amazing that you are so fond of that lake and understand it.

D. Interviewee H

Austin: What is your job title here?

Interviewee H: I am a Community Ranger.

Austin: What does that entail?

Interviewee H: That entails a range of different activities, but primarily working with externals, focusing on working with external agencies, non-government organizations, community groups, volunteers as opposed to a lot of my colleagues who are focused on doing DOC work. I am focused on working with people outside of DOC and facilitating and pairing them to get involved with conservation work.

Austin: How long have you lived in the Wairarapa region?

Interviewee H: I have lived here since 1981.

Austin: What do you value most about Wairarapa Moana?

Interviewee H: There are a lot of things that I value about Wairarapa Moana. Probably most, I value it as a natural area and the natural values, the birds, the lizards, the native plants, the native fish. I also value it as a conservation project and working collaboratively to as a tool to upscaling the size of conservation projects. I value that opportunity. That Wairarapa Moana is an opportunity to practice upscaling, working on a big landscape and primary strategy in order to achieve that is collaborating with other organizations and individuals.

Austin: What is the importance of Wairarapa Moana to the Department of Conservation?

Interviewee H: The Department of Conservation owns the bed of Lake Wairarapa and Lake Onoke and quite a bit of other land around the boundaries of Lake Wairarapa. So, they are a land owner down there. Also, the Department of Conservation's goals, some of the main goals involve preserving and protecting natural values so Wairarapa Moana is important to us because there are a lot of natural values down there in terms of fish and birds and plants and things. I

think my personal values along the lake are pretty similar to what the department values as well-an opportunity to collaborate with others to practice large scale conservation.

Austin: How does Wairarapa Moana provide for the general community's needs?

Interviewee H: Indirectly, it's a large natural area and so, therefore there is quite considerable ecosystems services that are being provided from all the natural values of that area so there are trees that are producing oxygen that we are breathing. There's a large body of water that is running through that has fish that people are able to catch and eat. So, it is providing food. It is providing a lot of intrinsic value to the community in terms of, the general population, just knowing that it is there and that it is protected and that it has a lot of birds and plants that give it a sort of good feelings that we are putting these areas aside and we are doing our best to look after them. There is a certain amount of farming that goes on down there as well and water is extracted out of the lake for farming purposes as well. It's a place for people to recreate. It's a place for people to connect with nature. It has lovely, quiet, beautiful places where people can go to think and get some exercise and breathe some fresh air.

Austin: How does flooding, or the lack of flooding-

Interviewee H: -It has cultural values as well. There's a history of settlement by indigenous people around the lake. So its cultural value in terms of physically where they lived and how they operated and myths and legends that are associated with the lake. I might think of a few more as we go on.

Austin: How does flooding effect the wildlife in the region?

Interviewee H: That's a good, broad question. Depends on how often it floods and how big the floods are and what time of year. I am not a trained ecologist, I just know what I've picked up from years of working for the Department of Conservation. Essentially, from what I understand, many years ago, before man intervened with any engineering down there, Lake Wairarapa and Lake Onoke tended to, in the summertime their size reduced hugely. So they are both wide, long, shallow lakes and so in the summertime through evaporation and through a lack of input the lake margins used to dry up hugely and the width and the length of the lake reduced hugely. So theres this massive fluctuation between summer lows and winter highs. That entirely a natural way the

lake operated- dry up hugely in the summertime and expose this big, dry margins and then in the wintertime it would expand hugely. The plants and animals that existed down there originally were totally adapted and in sync with those types of rhythms. Whereas today, we have quite a considerable amount of engineering in terms of the barrage gates and stop banks and drains, etc going on down there. Essentially, to summarize without getting into too much detail those things tend to work to entirely reverse those processes. They hold the lake artificially high in the summertime in order to prevent certain problems they have had in the past. Like, in the summertime we would get strong winds which would have whipped up all the sand at the margins of the lake and blown it across what's now agricultural land. In the wintertime they try to reduce the amount of water in the area to prevent too much widespread flooding in order to protect agricultural land. They have reversed the cycle to some degree. Instead of it being low in the summertime and high in the winter, it is a lot higher in the summertime and lower in the winter. So consequently a lot of native plants and native plants and animals that originally existed in the area are challenged by it.

Austin: Do you think flooding is a major issue, currently?

Interviewee H: It can be. It varies from season to season. You can only imagine, as the effects of climate change, the extreme weather events are going to become more common. You would be silly if you were to bet that flooding isn't going to be a problem in the future. I think that, from our point of view, from a conservation point of view, flooding is not necessarily a huge problem down there. We are probably more concerned about the lack of water in the right places at the right time. We are probably more inclined with seeing more water in certain areas at certain times. I know it is still an ongoing problem for people who are trying to farm and for the roading infrastructure and the people who live around the margins of those areas.

Austin: Do you think it has been well-managed? The flooding?

Interviewee H: Big question. Prior to any infrastructure going in down there, flooding was a natural part of the cycle down there. Virtually every winter they would have been floods down there. In a natural situation, flooding is a regular occurrence and it wasn't a problem. Can you repeat that question again to make sure I got it?

Austin: Is flooding well-managed?

Interviewee H: There's always room for improvement and I think as managers we are duty bound to always be looking for ways to improve. The only reason why I am struggling with that question is because I am not sure if you are asking me as a conservationist or are you asking me as a citizen of the Wairarapa region. If I were to answer you purely as a conservationist, I would say 'no, it is not well-managed. You should get rid of all the structures down there: all the stop banks, all the barrage gates and put it back to the way it was and let it all go its own way.' An answer like that is impossible. It is totally unacceptable to the towns and infrastructure and community. So I have to look at it as a conservationist, how we can get the best production for conservation down there given the constraints we have at the moment. We do have Lower Wairarapa Valley Development Scheme and the barrage gates and drains and stop banks. I think there are opportunities to manage the water and manage flooding to ask ourselves if there are new ways we can manage that that is going to serve the wildlife and serve the native plants better.

Austin: What do you think of the current target lake water levels?

Interviewee H: I am not 100% sure because I'm not update enough with what those are at that level of detail to comment on that, but Tony will be able to give you a lot of detail around that sort of stuff. My gut feeling is that, from a conservation point of view we have to look at fish passage through the area. A lot of our native fish are migratory. They spent part of their time in the freshwater then part of their time out at sea. We have to look at the way we are managing flooding down there, the engineering solutions that they have put in place and how they are serving the fish. That's what I would love to see some detailed discussion about, the scientist, the fish experts, and the water experts and to see if there are other ways of managing the barrage gates so that they do protect some of the farmland down there, allow people to carry on with their economic pursuits, but also serve the wildlife and get maximum productivity from the wildlife as well.

Austin: How are the fish important to the Department of Conservation? What specific kinds of fish?

Interviewee H: There are quite a few species. A lot of them are in the Galaxiid family, commonly known as whitebait. There are also longfin eels and shortfin eels. All the native fish species are important to us. They are part of the natural treasure of our country and a lot, if not all of them, are not found anywhere else in the world other than New Zealand, apart from when they are migrating out into the Pacific. As part of what we do, as the Department of Conservation, part of what we are in charged to do is to protect the native plants and animals of New Zealand. They are important to us for that reason and they are important to us because of the part that they play in natural processes that go on down there. As we all know, nature is an amazing piece of design and everything is linked in together. These fish species are individuals and there are different species but they are also performing different functions that we partially understand. What we do understand is that we need a healthy, robust fish population as well as various plants and other animals in order to have sustainable ecosystems down there which provide the ecosystem services that support us as humans on this planet. They are one of the species that we would like to see healthy and thriving down there.

Austin: How are the whitebait and eels affected by the barrage gates?

Interviewee H: One of the main reasons is that the barrage gates can be a big impediment when migrating for their life cycle. A physical barrier that doesn't allow them to get to where they spawn or get back up to where they spend most of their life living. So there is a physical impediment there. It also may be playing a part, as the fish lay their eggs in the estuaries, a lot of them do, and when they hatch, months later they are washed out to sea and they float around out there for a period of time then they migrate back up the river systems and live their life up in the river systems and the wetlands systems. They will swim right up into the mountains basically. I don't think anyone is entirely sure how they rediscover the river entrances when they are floating around at sea, but there could be some chemical things going on there, could be other things that the barrage gates could affect that will be the positive or negative as to why the fish carry out their life cycles, migrating from the freshwater into ocean and from the ocean back into the freshwater. Depending on how we manage that barrage gate, it could have an effect on their ability to successful make that transition.

Austin: There is a fish passage in the barrage gates, is that not functional?

Interviewee H: I'm not a fish expert. I have worked for the Department of Conservation for a long time. My gut feeling is probably inadequate in term of thick gulls that we've got, healthy, robust fish populations. I think it's potentially not good enough. We can do a lot better than that with a bit of additional information. With a more sophisticated approach, we could have a way better result in terms of fish productivity. We would be better off to look at the times of year and the times of day that we are opening and closing those gates and which ones we are opening and closing as opposed to relying on a hole that cut into one of the gates. I think there's problems when the whitebait migrate they tend to follow the banks and they tend to follow at a certain height below the surface and of course the water levels are always fluctuating so you are depending on one little slot, one little gate in order to allow fish passage. That's pretty hit and miss.

Austin: What is the state of the water quality in Lake Wairarapa?

Interviewee H: Could do better. Once again, I am not a scientist, so I couldn't tell you how much phosphorus is in there and how much nitrogen is in there and that sort of stuff. From what I hear, it's not the pure of water and there's issues with fertilizer run off and accumulation of sediment- the clarity of the water.

Austin: How do the barrage gates affect water quality?

Interviewee H: Prior to the barrage gates, the Ruamahanga used to run into Lake Wairarapa before it flowed down in to Lake Onoke. That made the water flow into the bottom of Lake Wairarapa and swirl around and create currents and create flows and create flushing affects. When the barrage gates were put in, also the Ruamahanga diversion was put in, that stopped that flushing affect from Ruamahanga River into the bottom of Lake Wairarapa. That has had a big effect on the volume of water that is flowing through Lake Wairarapa and the ability of the lake to flush out sediments and flush out any pollutants that may be coming in there.

Austin: How can the water quality be improved in the lake?

Interviewee H: We could work together with landowners to improve farming techniques and it will prevent additional pollutant from going into the lake. Not only farming techniques, but other pollutants from towns and houses. They could definitely help. So that's about less input, less

pollutants going into the lake. We could potentially look at things like restoring some of the flow of the Ruamahanga River back into Lake Wairarapa, so reinstate some of that flushing affect. We could look at operating the barrage gates and various different way so that we could maximize the flushing affect of letting water go at a particular time so it carried sediment out. More restoration around the lake with native plants to help soak up and improve the water quality that is entering the lake.

Austin: What are your views on the farmer irrigation in the region?

Interviewee H: Again, I am not really an expert in that area. I don't know how much water is being dragged out of the lake and thrown on paddocks. The regional council issues resource consents on that issue. I think there is potentially, in New Zealand as a whole, generally there's an attitude that if we want to grow more grass, we throw more water at it. Where do we get the water from? Well, the nearest river or the nearest lake. That's acceptable. I don't think we can continue to have that attitude as we move on forward into the future. So my attitude around irrigation is that I would like to see landowners, farmers, people doing horticulture and stuff down around the lake actively seeking more efficient ways of growing crops that doesn't require sucking vast quantities of water out of the lake and out of rivers and streams that feed the lake. My personal view is that permaculture-like techniques I would dearly love to see those better explored by the general farming and agriculture community and taken more seriously and look into some of the design techniques that they are developing in the permaculture world and seeing how they can be applied down around the lake in order to not have to suck so much water and to be self-sufficient with their water.

Austin: What is your opinion on the current state of the wetlands?

Interviewee H: Struggling. I think the Wairarapa Moana Organization is a big step forward. It is bringing together all the groups that have an interest in doing something positive down there and has allowed us to play to our strengths, so that builds well for the future but there a big job ahead of us. We have had some good successes but status wise, it still has some really neat things but it still a little sick and needs help.

Austin: What would you like to see changed in regard to the wetlands?

Interviewee H: I would like to see more native trees and plants around the lake and wetlands and around the streams and rivers that feed the wetlands so we have the maximum opportunity of purifying the water that feeds the wetlands and provides maximum habitat for the types of plants and animals that like to live in those situations. The more native trees and plants- can you repeat that question again?

Austin: What would you like to see changed about the wetlands?

Interviewee H: I would like to see them more accessible for the general public, that it becomes one of the five major visited destinations in the Wairarapa. My reasoning behind that is that the general public at the moment doesn't have the knowledge on how to access the lake and therefore it's not in their consciousness. I would like for them to be able to access it more regularly and to take it to their hearts more and to be more proud of it and support the conservation and to become more educated about wetlands by being about to access it and experience it for themselves having a natural curiosity to learn more about wetlands especially that particular wetland. More visitor accessibility, more community involvement, more business sponsorship. I just really want to see the Wairarapa Moana Organization grow to be a highly effective and efficient machine that's maximizing the conservation of natural values down at the lake and natural processes, that we can restore it to health and preserve the natural and cultural values down there. Be a place that we are all proud of and a place that we all want to visit and enjoy. When we do, we are going to see some special things down there.

Austin: What's your opinion on the Ramsar status of the lake? Like the application for it?

Interviewee H: My opinion is that it is a really good thing and that its definitely worth pursuing and that if it did have Ramsar status it would increase its visibility and increase our likelihood of being about to access resources to protect the lake and improve the Moana in general, improve the natural values and processes that go on down there. I am aware that landowners down there are suspicious that if we have Ramsar status that somewhere down the line it would limit their ability to run their business the way they do at the moment so that's an issue that is currently challenging us. We hope that in the future we can get the landowners on board and they can see the additional pulling power of having Ramsar status we have down there in terms of getting additional resource to look after the natural values and create some visitor facilities.

Austin: Can you explain the current conservation efforts regarding Lake Wairarapa? Like identify them?

Interviewee H: There's efforts around pest animal control. There's efforts around pest plant control. There's efforts around to provide visitor access. There's water management efforts going on. There's efforts around fish in terms of trials on how to control introduced fish. There's administration of the whitebait regulations that go on every year to ensure that the native fish are overfished. You could go on for quite some time about that, I am not sure how detailed or general you want my answers to be.

Austin: Do you think there's a need for more anti-pollution measures to be taken?

Interviewee H: Yup.

Austin: You can elaborate if you want.

Interviewee H: A lake like that sits at the bottom end of the system and often as a result, there's a lot water from different source input into that lake. That water can become contaminated through a number of sources. One thing that we all know is that if the banks of those rivers are nicely planted and vegetated then that tends help pollutants from entering the streams and therefore entering the lake. Definitely more planting at all the inputs. All the towns of the Wairarapa essentially their wastewater, at some point, ends up in the Ruamahanga River and the Ruamahanga River ends up in Lake Wairarapa. All the sweage outlets from the towns and all the wastewater, storm water from the towns. We have to look at that stuff and do a better job. There are some really good efforts going on at the moment. Martinborough and Carterton, for example, are putting in some quite sophisticated sewage treatment stuff, but we still have major problems around the sewage treatment in Masterton going into the Ruamahanga River, so definitely we need more work around sewage treatment and storm water treatment and any other, what they call, point source pollutants entering the river. There's no reason why we can't put more effort into that and come up with some smart solutions. We don't have to accept that it is inevitable that we continue to put sewage and storm water and other contaminants into the Ruamahanga River. I would like us all to be working hard on finding solutions to those issues.

Austin: Switching focus back onto the Lower Wairarapa Valley Development Scheme, how does the operation of the barrage gates affect daily life in the region and the rest of the lake?

Interviewee H: It alters the level of Lake Wairarapa and Lake Onoke. All the landowners around edges of those lakes can be directly affected if those lakes are excessively high or excessively low. Obviously it has an effect on wildlife as well. If it's too high at the wrong time of year it can inhibit the breeding cycles of bird or fish. It can provide an additional pressure to the plants that live on the side of the lake and cause them to be stressed and therefore providing opportunity for weeds to move in.

Austin: How does it affect the birds? Can you talk about the birds a little bit?

Interviewee H: There's a whole range of different types of birds that live down at the Moana. Some of them are wading bird, some are deviling birds, others are pasaron urchin birds. Any of those birds that depend on the water are obviously directly affected by the lake if its too high at the wrong time of year then it could flood their nest and prevent them from having a successful, annual breeding cycle. Otherwise it can cover habitat that would have otherwise been useful to them for breeding or for feeding and now, there are no use at all because the waters too deep and therefore there's prey species go somewhere else and don't want to live there. They affect their food supply as well as their ability to breed.

Austin: Generally, are the water levels okay for the birds?

Interviewee H: I think it's a mixed bag. I'm not entirely convinced that a lot of effort is going into understanding the requirements for food and breeding that various different birds have and then making the adjustments to the way the barrage gate is actually operated in order to maximize food and breeding habitats for the birds. I am talking the native birds, not so concerned about the game birds. Although, others will be more concerned about them.

Austin: How could the barrage gates be operated in the future to better suit the regions environmental needs?

Interviewee H: I haven't got specific answers around that because it would require quite a lot of detailed science to get it 100% correct. Essentially opening them and lowering them with much

more gravitas being given to the breeding and feeding requirements of native animals and plants. Better understanding of ensuring that the managers of those gates, whoever is operating them deciding when they open and close, that a major part of the decision making process is around the requirements of the native birds and native animals and native plants. The requirements of a natural process. We want maximum production, just like a farmer wants maximum production from his land in terms of sheep or beef raised. We want maximum production from the conservation of land in terms of numbers of native fish, birds, and native plants that are thriving in the area.

Austin: How do you think a resource consent should handle the conflict of interest between the farmers and DoC's perspectives? Where is the compromise?

Interviewee H: The first thing that springs to mind is that whenever you are selling a product, then people will buy your product if there is more than one good reason to buy that product, not necessarily going to buy it just because it is cheap, or just because it tastes good. They are going to need a couple of good reasons. Brand "New Zealand" tends to trade on the fact that New Zealand is a relatively clean, green place and that international people should buy their products from here because we have a good record in terms of looking after our wildlife and our native plants and animals. If farmers that are farming down around the lake truly want to be able to sell their product on the international market in an ongoing way, I think it is wise for them to come on board and put more effort into preserving the natural values of the lake and if they can claim to be putting in a lot of effort into that and having success around that stuff, then they can hold up their product and say that this is not only nutritionally good to eat, but it has been ethically grown and farmed. If you spend money in buy this product, then a certain amount of it is also helping the environment. That's a compromise I would like to see them make. That's something I would like to see them take onboard more seriously. From our point of view, we have to better understand how farming works and production needs and requirements of farmers so that we can better identify opportunities to work together. I think that's beholden on us to understand farming better and listen to their points of view.

Austin: What environmental impacts are there from the Ruamahanga River cut off and having that strip of land with essentially stagnant water?

Interviewee H: That's a lot less usable by native fish. It is a fish barrier. We talked about how fish migrate into the water system. So, it presents a physical barrier but also, most of our fish prefer highly oxygenated environment as oppose to a low oxygen environment at the moment so essentially it is an incredibly poor habitat for native fish, the way it is with no flow in it. It has very little value to native fish as it is.

Austin: Should anything be done about water stagnation in the cut-off?

Interviewee H: Yeah, definitely. I think it would be lovely to do something about that. I understand there is probably quite significant engineering issues associated with that. I would like to think that all we would have to do is put a pip under the road and put a flap pad on it or something and we could let some water through there and that would solve all our problems but the real world it's probably not quite as simple as that. In so saying that there is always an answer, there's always a solution to these problems and I'm sure there's a solution to that one as well. Whether it's a simple issue in terms of physically how you could take a portion of the water out of the Ruamahanga and either let it flow or pump it into the top of the cut-off on a more regular basis, whether it is a more broad, general approach that could be about how the barrage gates are operated, getting creative around mitigation instead of we may have to accept that there is no engineering solution that is sustainable in terms of reinstating that particular part of Wairarapa Moana, but I think there might be other really cool things we can do in other parts of the lake that would help to reinstate the values that we've lost from that area. We could do a lot of restoration work in other areas that would benefit longfin eels in particular because there used to be an important place for longfin eels.

Austin: What are the overall advantages and disadvantages of the Lower Wairarapa Valley Development Scheme?

Interviewee H: The overall advantage is that it allows farmers to more successfully farm that area. It gives them access to a lot of flat land that is not far from the water and can grow grass and crops for extended periods of the year and therefore certain economic prosperities for those individual land owners and then trickle down for the rest of the community. Ecologically, I guess, there are parts of the Lower Wairarapa Valley Development Scheme that there might be drain that were created or diversions that were created that weren't there before that native

animals have moved into since they were created. That's a good thing. Disadvantages, the main one is the overall wholesale, the complete reversal of water regimes and how they naturally work in that part of the country. Reversing the whole situation from extremely low amounts of water in the summertime to extremely high amounts of water in the wintertime and the effect on natural values that it has had.

Austin: If there is one thing you would like to see with the scheme going forward, what would it be?

Interviewee H: More sophisticated approach to the way the gates are raised and lowered and the timing of that and more resources put into it and understanding how the natural processes work and what part the barrage gates can play in improving those natural processes to be operated in a sophisticated way, raise and lower the gates in a sophisticated way as according to nature's processes and what nature requires. Also, acknowledging that they are there to protect farm land and it has got to achieve that as well.

Austin: By 'a sophisticated way' do you mean like trying to determine a more appropriate time for fish to pass through or like more appropriate seasons for allowing the water to creep up for the birds?

Interviewee H: Yes, that is what I am talking about. You know, do the people who operate the barrage gates understand when the native fish are migrating? If they do understand it, is there some way they can operate the gates to maximize the amount of fish that get through there at that time of year? Have they got all the information that is available around the breeding needs of the wading birds and what sort of habitat they need to nest and the effect of the water levels on their nesting and how they can operate the barrage gates to maximize the product of the wading birds nesting and also their food as well? Have they got enough information to understand how the water levels affect food availability for native animals and if they have got that information, can they operate the gates in a way that will maximize food for native birds and will they be able to use that area year round or whatever time of year a particular species needs to use it. That would be the main thing, somehow getting the engineers to operate those gates and the scientists who know the requirements of nature to have a very intimate relationship.

Austin: What if it turns out that they are already doing what is possible with the gates?

Interviewee H: Through the resource consent?

Austin: Yeah.

Interviewee H: That's a tricky question. I don't think, personally, that we have gotten to that point. I think that there is definitely room to maneuver. There's more learning that we could do, in terms of what the requirements are in nature and natural processes in that area. That's a good question, I don't know. That's the main thing on my mind. Perhaps it could be more incumbent on the person who has the resource consent to operate the barrage gates to provide the research into the natural values of the lake, fish surveys, habitat breeding, habitat surveys, gathering all that natural information and monitoring bird breeding and monitoring fish access, and measure that against why they are operating the gates. Why should that be someone else's job? If they are operating the gates. There the ones affecting the natural environment, then it should be incumbent on them to have an intimate understanding of the environment and the effects of the gates and why they are operating the gates. Perhaps a condition of the consent could be that they do more ongoing scientific research of natural values around the lake particularly around the effects of water levels on native animal food and breeding habitat.

Austin: That's all the questions we have for you. If there is anything else you want to tell us regarding the barrage gates or the resource consent, we would appreciate that.

Interviewee H: Nothing springs to mind at the moment. Personally, what I am involved in around the lake these days in relation to Wairarapa Moana is the visitor access type things, visitor facilities. That's where I am involved at the present. I am not quite sure what role the barrage gates can play in that. I think probably not so much the barrage gates, but the whole Lower Valley Development Scheme and all the drains and stop banks. The stop banks can be great places to locate walks and public access. They are high so it means when you are walking on top of the stopbanks you get great views. So working with us to help provide better visitor facilities down there and visitor access by helping us have access for visitors along the tops of those stop banks and working with us on that. You get wonderful views of the wildlife and general landscape and stuff walking as you walk along the top of those stop banks. It could be

lovely walks and they could be great places to ride a mountain bike as well. So, working with us on those sorts of things.

Austin: Are you currently working on that?

Interviewee H: Yeah. We have got some plans around that. [point on map where he is working on visitor facilities]. First of all, an entrance sign, a large sign that says that this is Lake Domain. It tells people that they are actually in the right place, this is a place where you can access the lake, having a carpark, having a gate that gets you through the first fence, and then having some sort of walk or track that can go around and having some interpretation sites, some education material at each of those sites. So if we could achieve an entrance sign and a carpark and a walk and some education material at each of these sites, that would be awesome. It might also include a shelter and a toilet, those basic facilities that people need. They can go to our website, look at the overall view, get some overall information, have a think about one of these sites or all of these sites that they would like to visit, then they can get a hold a brochure, that they can put in the glovebox of their car that would direct them to one of these sites or all of these sites and when they get to that site then can throw the brochure back in the glovebox, park their car, read the information on the sign, find a path to walk on and it would be of sufficient standard that you could take your kids or your aging mother along there and you could have a great family time together. While you are out there you are going to encounter some interesting signage or you are going to be able to use an app on your phone swipe a QR code and call up some intriguing information on that site and become a little bit more intrigued, inspired, or educated. Currently, there is very little of that stuff down there at all, so it's not surprising that most locals in Wairarapa or Wellington don't know a whole lot about the place and aren't involved to any large degree in terms of restoring it. I would like to see more people accessing the lake in a way that doesn't harm the environment and therefore becoming supporters of the project and long-term project, being sustainable in terms of resources, the more support you've got the more people that have visited the place that have taken it to heart the more likelihood you have of having a restoration project being able to sustain itself over a long term.

E. Interviewee I

Austin: What exactly is your job title?

Interviewee I: My job here? Here, I'm the director of national support for the partnerships group.... I've been here for about six months. Prior to that I was based in [Manoatou] , Wairarapa, and Hawke's Bay.

Austin: Do you currently live in the Wellington region?

Interviewee I: No, well I live here during the week, and on the weekends I live in Hawk's bay.

Austin: What do you value most about Wairarapa Moana?

Interviewee I: So when you're referring to Wairarapa Moana you're talking about the lake, or the lakes?

Austin: Wairarapa Moana is the lakes and the river system catchment. Yeah, that whole.

Interviewee I: So what I really value about the Wairarapa Moana system, if you like is the potential that the lakes and the river systems offer in terms of improved water, the potential there for improved water quality, and recreation, subsequent recreation or commercial – more general use of water. The existing values are around species that have survived there, despite the degradation of the water quality and the management changes to the Moana through the flood control scheme and development for farming. Those are the uses. There's huge assets there, biodiversity assets in terms of botanical species, threatened native species of fish, birds, etc.

Austin: How does Wairarapa Moana provide for the community's needs?

Interviewee I: That's a tricky question, I think. I think potentially it could and I think historically it said, currently I don't think it does, I think it's failing because of the impact European development has created on the systems.

Austin: So like the barrage gates, the whole flood scheme?

Interviewee I: Well I think it's the flood scheme, it's the draining of the lake from its original- the lower of the water levels from its original levels, that's all had a detrimental effect on the biodiversity in particular, especially the fish. There's introduced fish species in the Moana, the whole thing is in a pretty sad state, from degradation really.

Austin: How does flooding, or currently the lack of flooding affect the wildlife in the region, so the birds, the fish?

Interviewee I: Well the lack of natural flooding cycle- so the natural flooding cycle has been interrupted if you like, by the diversion of the Ruamahanga River through the new channel, away from the Wairarapa Moana, and the constriction of the barrage gates which are able to manipulate the water level in the lake. How is that impacted it? Mainly, I think, the biggest single impact from my perspective is the lack of flushing effect that the flooding system used to have on the lake. So in a heavy flood, the surface water runoff went through down the Ruamahanga channel, into the lake. The lake flooded, overflowed, and it tended to flush out silts and other pollutants, I guess, deposits. That doesn't happen anymore. So when the Ruamahanga gets to a certain level in the new channel, they open the barrage gates and the water backs up into Lake Wairarapa and then they close the gates when Lake Wairarapa's full. They close the gates when the river goes down, they open them, the water level gradually flows out, so we lose that flushing effect.

Austin: The flushing effect was important for the water quality?

Interviewee I: Well I think, it's just important for the natural systems, ecologically. So the net result, I believe an accelerated build up of silt in the lake bed, and that sediment build up retains the pollutants that come from industry, farming, waste water from the Wairarapa towns, all of it....

Austin: Do you think flooding is currently being well managed?

Interviewee I: Absolutely yes, I think, especially in economic terms. I think it's a very, very- from an agriculture, production perspective- it's a very successful scheme, and it's well-managed by greater wellington regional council. What I think could be managed better is how the flood management infrastructure is used and could be used to have a less devastating effect on

ecology. So I believe there's room to manipulate the management regime of the barrage gates in particular to provide better ecological outcomes.

Austin: Is there any specific ways that you can think of?

Interviewee I: Well, I think it's probably around more consistent water levels in the lake. When the water level drops beyond what we might say is reasonable, and there is a water conservation order on the lake, which restricts that variability of water level, but I think it could be better managed so that the water dependent species were better facilitated and coped for.

Austin: What do you think of the current target water levels?

Interviewee I: I've probably got mixed views about that. I think there's a view, a very realistic view, and a real view around economic values, and around facilitating agriculture production. And I think from that perspective the water levels are managed quite well. From an ecological perspective, I'm less convinced.

Austin: So you'd like to see higher water levels or lower water levels or more of the natural cycle?

Interviewee I: More of a natural cycle within the tolerable limits, and more consistent water levels. To me that would probably mean constructing some way of diverting water back through the original Ruamahanga Cutoff into the lake, at low levels, when the lake levels are low. And I think that's perfectly feasible, not sure what the cost of that would be, but I don't think it would be astronomical. But I think, what happens is, in dry periods we get artificially low levels in the lake, and we don't really have any mechanism to supplement the water level at those times. If we could divert water back in those low level times, minimal level periods through the Ruamahanga cut off, back into the lake through the existing Ruamahanga river, I think that would be hugely beneficial.

Austin: What is the current state of the water quality like in Lake Wairarapa specifically?

Interviewee I: Heavily polluted, I would say.

Austin: How do the barrage gates affect the water quality?

Interviewee I: I think they affect the water quality in the way I explained earlier, they prevent- the barrage gates in conjunction with the Ruamahanga diversion- I think the single biggest factor is that they limit the flushing effect that floods have on the lake, and the way they are managed at the moment, to my mind does not achieve the maximum benefit that could be gained if they were managed differently, from an ecological point of view.

Austin: What are your views on irrigation in the region?

Interviewee I: I think irrigation water takes are quite well-managed, I don't have a whole lot of confidence in the science that's available to the regional council to effectively manage irrigation. I think there's a mix of surface water takes and ground water takes. I think there would be benefit from better research outcomes particularly around ground water. Surface water, I think it's managed reasonably well. Certainly irrigation is hugely beneficial from a productivity perspective. The regional economics, for the Wairarapa are heavily reliant on agriculture. I think we do have to be realistic about irrigation and we have to be very mindful of the benefits that irrigation brings in terms of social and economic gains it brings to the region, but I do think we could benefit from better science and understanding particularly of ground water. Because I think if the ground water aquifers are underutilized, then that may present an opportunity to minimize the surface water takes and therefore have a lesser impact on [in stream bioter] and surface water quality. I think the Wairarapa irrigation proposal for creating water storage from water storage during high flow periods to supplement irrigation demands through low water level periods is very, very positive and beneficial. Potentially beneficial.

Austin: Now does the ground water takes have any effects on the water levels in the rest of the system?

Interviewee I: I don't know. I suspect they do, generally speaking in the sort of geology that is represented in the Wairarapa, ground water takes, especially if they're over allocated will affect surface water. But I don't really know. I'm not an expert in that area. My suspicion is, if they don't they certainly have the potential to.

Austin: What is your opinion on the current status of the wetlands on the eastern side of the lake?

Interviewee I: I'm not sure what you mean by status, I think they're very valuable. I think wetlands like boggy pond, Massy's lagoon, [Wairariri] for instance. There's a real opportunity there for them to provide a service to water quality. We know for instance that surface water that passes through effective and efficient natural wetlands, the water quality exiting those wetlands is vastly improved on at the entry point. I think they're very valuable. They are protected. We need to protect them. We need to enhance them. And where possible we need to return them towards that natural state, and [expands]. We'll never achieve that in its entirety, but there are opportunities and there's some good work being done by Ducks Unlimited, which you're probably aware of at [Wairariri] wetland, which is actually returning bits of land to the wetland status, that they originally were. That's hugely beneficial ecologically, and economically because those wetlands can provide a service in terms of improving water quality and from the runoff from farms, etc.

Austin: Pertains to the barrage gates is there any way to operate them differently in order to-

Interviewee I: Yeah, I do. I do think they can be operated more effectively from an ecological perspective and still maintain their effectiveness in terms of flood control. In terms of getting into the technicalities of that, I'm probably not qualified. I just, you know my gut tells me that the management regime for the barrage gates is designed entirely for flood control, within the parameters of the water conservation order. I believe there's room to amend that operating regime to enhance the ecological circumstances within the lake, without seriously affecting the flood control ability of the gates.

Austin: What is your opinion on the Ramsar status, or the Ramsar application?

Interviewee I: I would need to declare an interest in that, pretty much I instigated that application for the Wairarapa Moana to become a Ramsar status. I did that because I believe only benefit can come from it, for everybody, not just for- not just ecologically. I think the Ramsar status would bring a whole lot of benefits to that area, ecological potentially, but in terms of tourism and public awareness, of the migratory species that use the Wairarapa Moana, I don't believe anybody would lose, nobody would suffer any disadvantage from it. And pretty much everybody would enjoy some benefits, but I boast because Ian Gunn and myself pretty much started it. That's the latest attempt, there were, there have been previous attempts, movements to

try and establish Ramsar, but the current one was pretty much established or instigated by Ian Gunn from Greater Wellington and myself.

Austin: As far as the farmer's who are worried about the Ramsar status, do you think there would be any potential ramifications for them?

Interviewee I: No, I don't. No I really don't. I think we've actually demonstrated and I think most of the farmers get it, that we can control, they can control, pest birds, or what they would classify as pest birds, specifically Canada geese. We've demonstrated that we can, DOC has worked with Greater Wellington Regional Council and with the farmers to ensure that Canada geese numbers are controlled at an acceptable level. The farmers actually fund it, you know somewhere between 2,000 and 3,000 Canada geese are taken out of that area very year, and have been for the last two or three years. Since the legal status of Canada geese has changed, in New Zealand, we've been able to do that quite effectively. ... the few farmers that object to the Ramsar proposal, their main concern is centered in my perception anyway, it's centered about a higher ecological interest in that area, which might be reflected through the regional council's plans and consents and constraints and those sorts of things. The fact of the matter is, that those sort of constraints are going to occur anyway, and completely separate from Ramsar. Ramsar itself will not create any additional rules, constraints of use, that sort of thing, on the Wairarapa Moana, particularly from a farmer's perspective. And farmers, and I am a farmer, so I know, I think I know, farmers are going to be subjected to greater constraints as time goes on, particularly around water quality and water usage, those sorts of things. I think their concerns are misguided and unjustified, and I think the bulk of them get that, and to some extent, what we're seeing there is the natural reluctance of farmers to accept change that is imposed rather than negotiated or agreed, worked out together.

Austin: Do you think the farmers are the main source of pollution? What sources of pollution are there to the water system?

Interviewee I: I think there's varying degrees, certainly there's no doubt in my mind that the intensification of farming creates elevated levels of pollutant runoff, which affects surface water, not just in the Wairarapa Moana, but everywhere. There's no doubt in my mind that that is the case. There are other quite significant sources of pollutants for the surface water and thus for

Wairarapa Moana and they're being, surface runoff from towns and storm water runoff from towns and sewage, wastewater discharge from towns. Undoubtedly, they're other sources, I guess historically, you can blame it on farming I guess, but a very significant cause of sediment runoff is the deforestation of the surrounding lands and the catchments. That's happened for a variety of reasons, farming being one of the biggest of those reasons; originally it was just harvesting timber. There's quite a range of factors here.

Austin: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee I: Yeah, I think there is, yeah. I think that where the regulatory authorities like Greater Wellington taking the industry, their planning processes, like I've already said, if I'm any judge they will create increasing demands for better on farm management both for [fertilizer in pots] and farm runoff and I think that's a good thing. I think there are significant gains to be made through those mechanisms.

Austin: How are the fish important to DOC and how are they affected by the barrage gates?

Interviewee I: Well the DOC has a responsibility to manage native species, particularly in circumstances where species are in a threatened state. Long fin eel, for instance, in the Wairarapa, I believe they are threatened and adversely affected by a number of factors, the water quality is one of them, but I think probably the most significant factor for longfin eel, is the loss of habitat and that would be- the way to remedy that in my view is around that water quality, that water level- maintaining a more appropriate water level in the Wairarapa Moana, which will sustain the vegetation and the habitat, for he eels and the [] in particular need.

Austin: Do the barrage gates play into the native fish vs exotic fish?

Interviewee I: Well I think they certainly interrupt the migratory patterns of native fish, particularly eels, and [], waitbait. I don't know, that they have any direct influence on introduced species. But certainly on flounder, on waitbait and tuna, eels. I'm sure they have a negative impact at times at least during the migratory seasons in particular and I think that could be better managed. Part of my previous statement, I believe the barrage gates could be managed under a better regime in terms of ecological outcomes.

Austin: Do you think the current fish passage in the gates is effective or should that be altered?

Interviewee I: Minimally, it will be effective, I think. I think to maximize that benefit it should be altered. I think that the periods of time the gates are opened to allow fish passage at times of the year, those periods of openness might be expanded. Would all be beneficial.

Austin: How are the birds affected by the current flood regime?

Interviewee I: I think the really the main effect on the birds is the reduced surface levels of the Wairarapa Moana and the fluctuating water levels within the Wairarapa Moana. That has an affect on the habitat in which the feed and nest, and the water quality of course. Probably is certainly not beneficial, it may not be hugely negative, from the bird's perspective. I'm not sure about that, but it's certainly not conducive to the natural character of the lake, of the Moana.

Austin: So would it be more beneficial for the birds to have a larger cycle, be more natural?

Interviewee I: Exactly, yeah.

Austin: How does the current flood regime play into the vegetation around the lake?

Interviewee I: Well, I think, that's simply exactly the same effect, we've got a lower lake level therefore a reduced surface area, we've got fluctuating water levels, which effect the floral cycles within the Wairarapa, loosely called the tidal zone. You know, the range of water fluctuation.

Austin: How much do you know about the barrage gate resource consent?

Interviewee I: Well I know that it's currently due for the renewal, it's about – it's coming up for renewal. In 2019, yeah. So I don't know a lot about the specifics, I have read the consent a long time ago when it was particularly relevant to the work I was doing. I don't think the consent is constraint on a better management regime, from what I remember. What it does do, is encourage the management of the barrage gates from an agriculture, production, flood control perspective. After all, that's why they were built. I understand that. Don't really have a problem with it, but I think in this day and age where ecological and natural values are much higher on the public agenda then they perhaps were in the 60's and 80's. I think that Greater Wellington should

certainly investigate the conditions of the consent and ensure that the conditions in the consent don't create an obstacle to more effect management of the gates.

Austin: What do you think would be a reasonable compromise would be regarding the operation of the barrage gates, considering agricultural and ecological needs?

Interviewee I: Well I think what would be a reasonable compromise would be, evaluating the ecological benefit that could be gained from tweaking the management regime without creating significant impact on the flood management benefits. So I don't know what that would be but I think it's sort of about seasonal management, ecological seasonal management of the gates. I do believe, probably the farmer in me, but I do believe, that the bottom line is flood control. That's the purpose of the Lower Valley flood control scheme.. That priority should always be maintained, but within reasonable ecological management bounds. So it's a matter of balancing the available ecological gains by a very management regime of the gates and the system, while still avoiding and still providing the risk mitigation around flood control.

Austin: The resource consent for 2019, it sounds like it might be a short term six year resource consent so that they can match it up, with one that encompasses the whole scheme, which is up for renewal in 2025. So an important aspect for that one is the Ruamahanga cutoff, so do you think there is anything that needs to be addressed regarding that piece of stagnant water there, the old riverbed, cutoff.

Interviewee I: Yeah I've already mentioned that. I think, I'm a strong advocate, and I think I initiated the idea with iwi, with Wairarapa iwi, that by diverting a certain amount of water from the Ruamahanga, back into the cutoff, the ecological values would be pretty significant. I think it's quite easily achieved, but I'm a layman. So it may be more complex than I understand. But I think that would be a tremendous step forward and a fantastic compromise. We've started with Greater Wellington; We've supported some restoration projects on the cutoff. We've, DOC has supported the McCreery's, who are farmers on that stretch, to open the lake end of that cut off, the little bit, we've provided the opportunity to de-silt that channel around willow island. Mike McCreery is using some of that sediment to build a particular stop bank to protect some of his farm. Really good compromise in my view. The next step, the next beneficial step is to have

some, water running out of the Ruamahanga back into that channel to get some water movement out of the cutoff and into the lake. Thus, significantly improve the water quality in the cutoff.

Austin: So you think that should be a pipe under the road?

Interviewee I: My farmer explanation is, two or three days with a digger and a culvert, that's placed at exactly the right height and the hydrologist can work that out. Small enough, large enough to allow a reasonable flow of water but small enough to prevent any flood, any significant diversion to a flood period. ...I'm pretty sure if those engineers set their mind to it, they'd come up to a solution quite quickly.

Austin: What advantages/ disadvantages are there with the Lower Wairarapa Valley Development Scheme?

Interviewee I: The lower valley scheme, the benefits are flood control, so that's a productivity thing, it's a human safety thing, it's an infrastructure protection, so roads and bridges, are protected. Houses, villages etc. The risk to those is structural assets is mitigated by the flood control scheme. Agricultural productivity is hugely enhanced. The disadvantages to me, from my perspective, are all natural heritage disadvantages, ecological disadvantages, which we talked about.

Austin: Which of these issues do you think should be addressed first?

Interviewee I: I think it's what I'm rambling on about all the time, It's about maximizing available benefits, capturing available benefits, to the maximum extent that's possible without threatening their other purposes of the scheme. So it's about better water level management. It's about providing fresh water access into the lake, from the Ruamahanga through the Ruamahanga cutoff; it's about more consistent lake levels. That sort of stuff.

Austin: Those are all of the questions I have. Is there anything you'd like to say about Wairarapa Moana?

Interviewee I: I think the one thing that we haven't touched on really, is the iwi interests and the cultural values of the lake. They are huge. Lake Onoke and Wairarapa historically were and have been the food basket for iwi, particularly pre- European but even since European settlement. That

factor alone, justifies a whole lot of change. Undoubtedly in my mind, the sector, for want of a better word, that has been most significantly disadvantaged by European development around the Wairarapa Moana are Māori. No doubt about it, in my mind. Not surprising they're angry, they've been cheated, they've lied to, they've been disadvantaged from day one, and I'm hugely hopeful, and I've had some involvement in the treaty settlement process for Wairarapa iwi. I'm hugely hopeful and quite confident some recompense from that will result, and some improved circumstances for the cultural values will result from the treaty settlement process. I think Greater Wellington, the bulk of Greater Wellington people would support my view, they'd say pretty similar things, I think. We should never allow ourselves to underestimate the cultural values of Wairarapa Moana, and we should do everything within our power to provide whatever relief to those reduced values we possibly can. In a balanced sense. So social and economic values throughout the Wairarapa are protected and enhanced as much as possible, but ecological, cultural values are advantaged as well. ...

Austin: How do you think we should go about changing the current setup to work with Māori cultural perspectives in the system while still not jeopardizing the integrity of the flood protection?

Interviewee I: I think that is entirely- the success in that regard – that is entirely dependent on the relationship that Greater Wellington has with local iwi and hapu, I think their relationship is quite good. I think what we've done in DOC is, we've declared, if you like for want of a better word, that [tongva whenua] our preferred partner, so I guess what that means is that- Well we've got some statutory obligations, which are different to the regional council. So section 4 of the Conservation Act requires DOC to fulfill the requirements of the Treaty of Waitangi for instance... We've gone beyond that to what we believed we've gone beyond that, we certainly intended to go beyond that. So we pretty openly state that iwi and I are preferred partners, wherever that's sensible and reasonable. I believe that Greater Wellington has got room in their current operating model, policy... to provide better and greater input from iwi into their policy development processes. I know they've gone quite a way down that, they've got the [whaitua], but I remain to be convinced that that will actually deliver for Māori, and I suspect Māori think pretty similarly. ... I don't think we'll see that walking the talk demonstrated until the end of the process. I think there's a genuine desire, I'm not being critical of Greater Wellington, I think

there's a genuine desire there to do that, but whether they actually understand what that means in real terms, I'm not quite convinced.

F. Interviewee J

Interviewee J: You've seen the shepherd's notch?... It's on a bridge. Have they not taken you to the bridge? There's a bridge on Western Lake Road... near pigeon bush... and look and somebody would point out on a fence post on the bridge, there's a notch been cut in the fence post. And that was the highest of the 1943 flood. It's about up to here *shoulder height*

Jeff: Above the bridge?

Interviewee J: Yeah. And that was, when that whole lot was flooded, what was happening was that, the outlet at Lake Onoke was closed and it coincided with a big rainfall event in the Tararuas and so the lake did what the lake does. Spread out and that was fine pre-late 1800s, the lake could do that, had all the room in the world, but post-1800s, all this country down here *points at map* was heavily populated with sheep and the lake became, shouldn't really say it, but the lake became a nuisance. And, it was those that were what really became of the Lower Valley Development Scheme

Austin: So we have prepared some questions for you.

Interviewee J: Fire away.

Austin: What is job title?

Interviewee J: Biodiversity Ranger

Austin: What does that mean?

Interviewee J: Trying to look after and promote where I can, biodiversity functions in the landscape. Can mean something as simple as protecting a single species... there's some pretty complex ecosystems, I'm trying to work out what makes them tick... trying to protect and enhance them.

Austin: How long have you lived in the Wairarapa region?

Interviewee J: Twenty years, although I first got to know the Wairarapa when I was probably five or six.

Austin: What do you value most about Wairarapa Moana?

Interviewee J: Party, it's the scale of it, but really it's the complexity of it... you've got things happening on such a big stage, that when you get in and start to unravel it, you don't find one ecosystem, you find a whole series of them and they're all interwoven. Everything depends on the water and it also depends on the drying. You do go from one extreme to the other. Somethings depend on being permanently flooded, others depend on not occasionally and all bits in between. That's only the natural aspect, then you've got the human aspect on the top of it and it's a big ask, a pretty big challenge to try and get the human and the natural existing in the same place. I think we've gone a fair way towards it.

Austin: What's the importance of Wairarapa Moana to DOC?

Interviewee J: It's one of our key sites. It's the biggest wetland complex in the lower north island. We've recently been doing some investigations to Ramsar to include it as a wetland of international importance. And that's meeting pretty much all their criteria. We'll see how that goes, it certainly does stack up as one of the nations most important wetland complexes.

Austin: Does it need to meet all the criteria in order to become...?

Interviewee J: No, it only needs to meet one. There are nine different criteria for inclusion within the Ramsar designation, the wetland needs to meet one of them. We were going through and doing some pretty serious investigations and thinking ahh, it meets this one and this one, this one... We knew it was a big and important wetland, but even that was a bit of a surprise.

Austin: So how does Wairarapa Moana provide for the community's needs?

Interviewee J: It's a big water store in times of flood so it's got its role as part of the lower valley and central valley's flood protection systems... It's got its role as a recreational asset, fishing, shooting, birdwatching. It's got its role as a natural asset. Different people in the community will latch on to one of those. But when you talk to them, you'll find that they recognize all of them. For Wairarapa people, Wairarapa Moana really is the heart of the whole place and if you identify with Wairarapa, one of the first things you'll identify with is that body of water.

Austin: Due to the different, recreational needs, environmental needs, flood storage... Do they all have different management needs, like for each of those different aspects of it?

Interviewee J: Yeah, they do, but they're different facets of the same management. Most of the recreational use down there is a combination of bird watching and duck shooting and if the ecosystem isn't healthy, then those two uses are going to fall over. If the habitat's not right, the birds won't be there. Flood protection, it's not... if it's used as a big dam for example, it will fill up too much, it's flood protection affects all its other roles. Integrating those has been a bit of a challenge but it's been done. You probably have heard stories of the initial coordinating committee when they set the original lake levels. That was 20+ years ago now, when all that work was done. The data does indicate that it's worked. The eastern lake shore habitat hasn't fallen apart. You're still getting good numbers of migratory waders coming through, same numbers as there were 20 years ago... similar to that and similar species... so whatever's happened to that, it's worked. It's at least held the line where a lot of other things have been dropping.

Austin: How does flooding, or I guess the current lack of flooding affect wildlife in the region?

Interviewee J: If you did go back to, what they call the big lake. The effects would be absolutely devastating. That would be from turning the lake into something that got huge. Instead of now, something that gets a little bit bigger, but it doesn't hold water to the extent that it used to, but the whole flood plains changed. The Ruamahanga flood plain... The Ruamahanga itself is now constrained by stopbanks for most of its length and it doesn't flood out into the land... and that used to be a mixture of wetlands and swamp forests... it's now pasture. The lake used to operate between [where it is now] and pretty much the foot hills at the base of the Aorengi ranges. And, was [the LWVDS] that created, maintained, destroyed, and was responsible for a whole sweep of habitat. It was a really dynamic place, there was stuff happening everywhere. The river would tear through and it would carve out a new wetland somewhere, where maybe that same flood or the one before would've deposited a whole lot of gravels into another wetland and effectively killed it. These things were changing, but they were changing on a huge stage, so what's happened since the barrage has been put in and the lower valley scheme matured, is that the stage has shrunk. The thing that drives the ecosystem... water... that's still there. It still rains in the

Tararua, but 90% of the water now, goes straight through to Onoke and out, it's not lingering in the flood plain anymore. But because the barrage is there, the lake still rises and falls. Instead of having kilometers of land where it was stretching. It's still, maybe two, maybe a couple of kilometers. I've been down on the eastern lake shore and walked one and a half kilometers before I hit water. So the lake's still, they used to describe it as breathing... It's not breathing as we know it, its breathing as in the lake takes a breath every year or two... very irregular... it sucks in a deep breath, expands and eventually it lets that breath out. Now the turf fields and the lake beds are exposed and that's still happening, that's pretty much central to that whole eastern lake shore habitat, you know it floods and it dries. So, you know the essence of the system is still there.

Austin: So even with the gates, it still floods?

Interviewee J: Yeah. And that's where the work that Greater Wellington has been doing with repeating the bird surveys. That was a big part in planning the original barrage gate application and setting the original lake levels... And there's the work that Lindsey and Co been doing, have you seen the transits they've got going out on the eastern lake shore. And that pretty much indicates that the turf fields are still there, but what it does seem to indicate is that they've moved a bit west and that's to be expected as this country behind them has become more stable as the lake isn't getting behind there and washing it out any more, it's not getting in there and moving the sediments. It's not disturbing the vegetation so the bank here has become a lot more stable. But, turf fields themselves have been migrating a wee bit. And that's another indication that the north eastern lakeshore is managing to stay fairly healthy. But, what's really suffered has been the wetlands in behind it. That was the sedge lands and the pools and the more vegetation, the more permanent vegetation... in behind the turf fields. They've really suffered. It's probably best to say it wasn't dynamic enough. A lot of these things rely on occasional flooding and it regular, but it's not for months or so. So I mean, if you look at a big time frame, it's pretty regular, but it happens intermittently and for a lot of these things, that take care of all the competition. So, the water goes down, that's how these [exotic] plants manage to find a foothold on the edge of and sometimes into the wetlands. Some of the plants that were given a chance were dominated near the shrub lands or forest. But, six months or a year or two or four years later... it floods and the water holds up there for months on end and those [exotic plants] are killed out. And it's taken

them beyond their capabilities, and so the swamps run out again. The water disappears and so the swamps run out. And, because that wasn't happening, the water wasn't sticking around, it wasn't up to those levels, that was the part of the ecosystem that really suffered. It got hit with some really bad weed invasions. We're trying to deal with that now.

Austin: Do you think the flooding is currently well-managed?

Interviewee J: There are times when I'd really like to see water held up for longer. Because I'd like to see if that did have an effect on the weeds, whether you could use water as a weed control, but *laughs* I'm not farming down here. And, that'd be a big ask of flood protection to ask them to hold the lake up for three months at a time, when there's likely to be another flood that'd come in over the top. And, one thing that Greater Wellington doesn't have is control over the inputs into that lake... It's got control over the exit, but when the Oporua floodway starts to work, that's governed by the water coming down the river... there's no way they could divert that from the lake or keep it in the channel and push it down here. The Tauherenikau flows into the lake... takes whatever load its got and puts it all into the lake... its nothing compared to the Ruamahanga, but that's how it works and so I'd be interested to see what would happen if you could hold the lake up, but I recognize that I'd be asking flood protection to take a pretty major risk. I can understand why they wouldn't be happy to do that where I could find other ways to get rid of weeds.

Austin: What do you think of the current lake water levels?

Interviewee J: I think they're working or I've got no reason for to find them not to be working. That's based on the turf fields, the lake margin and not a lot on the adjacent wetlands because the adjacent wetlands are rain and groundwater fed. I'm not sure how close their relationship is with the lake levels, but I think it's not that intimate.

Austin: What is the state of the water quality?

Interviewee J: Not great

Austin: How do the barrage gates affect the water quality?

Interviewee J: The biggest effect would be to stop flushing. In its old state, the Ruamahanga came down did a right hand turn and ‘delta’ed its way into the lake... The delta now is becoming a bit of a problem, it’s not got much water flowing over it... becoming more of a permanent fixture. The water would come in, do a big U-turn and push its way out through a narrow channel, and more water would be coming in from other fixtures... And so there’d be a fair push of water trying to get its way through here and... quite a reasonable current, pulling a bit of sediment out with it, but also, a decent amount of current running through, north to south in the lake... That’s not happening now, because 90% of the Ruamahanga goes straight past the lake and doesn’t even touch it. The other big change has been lack of a tidal influence. When the Ruamahanga is at low flows, you get a backup of water through the lower river as the tides are rising and falling and late last century, there were salt tolerant plants up in the main lake, but they haven’t been seen for probably sixteen years. Largely, because, theres only a few occasions of brackish water making its way up into the lake.

Austin: Due to the barrage gates?

Interviewee J: Yeah, well when the gates are open, I know the data’s up at Greater Wellington, but a few years ago when the barrage was being painted... there was a decent tidal movement when the gates were permanently open so the structure could get repainted. What did happen more than once... the lake level started to rise because Lake Onoke would block up and water would backflow up into the lake. That’s another thing that gets sort of counterintuitive. It’s hard to think of a river like the Ruamahanga flowing backwards, but essentially that’s what it was doing. And there was a distinct tidal influence up there too, even when it wasn’t blocked.

Austin: So they lifted all the gates for that?

Interviewee J: Yeah, all six. Lifted all the gates up, sand blasted them, repainted them. I thought oh great... I’ll see if this triggers a mass flowering of the turf plants, because that was...

Austin: Did it?

Interviewee J: No it didn’t, that was one of my thoughts, that if you went back into the dim and distant before the barrage and anything, there would be times when there would be pretty serious droughts. I wondered if that was what triggered mass flowerings in these turf plants... an internal

trigger. That if the plant was exposed to sun for more than say two weeks continuously, then it triggered it into flowering... But nope... put my plots out and remeasured them and no mass flowering and they were up... over a kilometer of lake bed. When I set them up, I walked out until I hit water and when I was measuring them, I think I got three quarters of the way out until I hit water and the last two or three plots were almost knee deep. That was the water flowing back up the river, through the open gates and back into the lake because Lake Onoke had blocked. That was the lake working the way it used to work. Well ok, having no barrage there is no guarantee that this ecosystem is functioning properly, or functioning the way I thought it was going to function. So, maybe the barrage isn't the impediment I thought it was.

Austin: What about the other aspects, the fish and the birds, what effects did it have on them.

Interviewee J: Fish is the big unknown, going back a dozen years now... I did some work with Greater Wellington... prior to the whitebait runs... probably early August, and probably into the beginning of whitebait season too. We went down there and set some nets up on either side of the barrage gate and determined that when they were closed, the gates were a good barrier and when they were open, the fish got through. That's a simple way to put it, but, one thing that's worth doing with the fish survey in these streams down here, Eastern Rumataka, we've got good forested streams running right down to the lake shore... The environment down there says that there should be really good fish number, a good sweep of species and good numbers within the species.

Austin: Does the fish passage work do you think?

Interviewee J: No, because native fish don't dive. When the fish passage was put in... *pulls out picture* this is down at Poinui Lagoon. Similar thing, you've got a barrier and a slot cut in, the trouble is that it's too deep. The native fish swim on the surface, at least the young ones do, those are the ones we're talking about... Close to the surface and close to the bank as well where the current is least. So having a slot cut into it isn't going to do anything because they don't like diving... they're not strong enough to swim against that sort of current. I've been down to the barrage and I've seen a decent plumb of water caused by the current going through the fish passage and little thing, they won't do it, but, there is now a condition in the consent that allows for the opening of the gates, based on the tidal, it's right after high tide.

Austin: Is that every day?

Interviewee J: I'd have to look at the consent, but, yeah the idea was that as the tide pushes up the river, it pushes the fish up with it, so if you open the gates, the fish get that little bit of a push and they go through. What the fish can do quite happily and really well is they can sense fresh water... The source, out in the ocean, New Zealand migratory fish have no fidelity to their home stream. What you really have is a... big swirling mass of young fish moving around in the current so depending on how the current's working, they could come from anywhere. They go through the larval stage and turn into young fish and it's at this stage they realized that to be home is not in the ocean. They are driven to find fresh water... They follow that trail [of fresh water] to the river and then up the river. When they're travelling up the river, they'll be able to sense all the different little tributaries coming in and they'll follow one of them. So, if there's no flow coming down the Ruamahanga because it's all entrained behind the barrage gates, the fish will continue moving up the main stream... I don't think they'll even bother [with the lake]... some of them do go up there. There's a pretty little bit of water coming out. They then school below the barrage gates, I have seen that in the past. So if the gates aren't open, that stops them pretty nicely.

Austin: What do they ultimately want to get to?

Interviewee J: For Ingua, the most common of the whitebait species, they're trying to get up into... the lowland swamps. Going into the very dim and distant past, but all this country here, all this Ruamahanga flood plain was a mixture of swamps and swamp forests and pools and other things. It would've been getting into those. On the side of the lake, these sorts of areas here, that was their destination, but for kōkōpou, the rivers. Giant kōkōpou will inhabit lowland swamps, but... short-tailed kōkōpou head a lot further up, much closer into the head waters of creeks.

Austin: What about just the main channel of the Ruamahanga? Is that desirable?

Interviewee J: There would be fish in there, in the lower part, you still do see the occasional school in there. But I think the mainstay of the river, aside from species like torrent fish and bullies was more of an access way that got the fish into their preferred habitats. I don't really

blame them. Giant Koukoupou get about that big *about 8 inches*, I mean they still prefer slow moving to still water, they don't like being out in the mainstead where they're constantly fighting the current. Yeah, torrent fish do and you'll get some of the small, you know the bullies and other things, you'll find them hiding under the rocks. You know the waters tumbling around... You find them hiding under rocks, where the waters coming down and there's that little bit of calm water. They're not out there swimming 24 hours a day against the current. And the eels of course, they like getting up here. Shortfin Eel... is much more of a lowland swamp species, longfins migrate right up into their waters. It's a piece of work, the fish numbers in the eastern Ruamataka streams have a good range of species and good numbers. Then, that's a pretty good indication that the barrage isn't causing a blockage or that some of these things have formed land locked populations, which they can do. Whichever tactic the fish uses, if there are plenty of them about then something is going right. If there aren't, then something isn't going right. One of the places you do look is at the barrage. Another thing you look at is predatory fish inside the lake.

Austin: So the exotic [species]?

Interviewee J: Yeah, particularly perch. But, there is some work now on trying to get perch reduced up at martin's lagoon to see if there is a corresponding bounce with native fish numbers... as always there's never a single or a simple solution. It's the hard one lesson of ecology. Look for the complexities, they'll be there...

Austin: So regarding irrigation by the farmers, what are your views on groundwater irrigation vs. taking it directly from the water system?

Interviewee J: I don't know how good the lake water is for irrigation, because you do get that salt coming up. That does affect its use. Groundwater is probably more of a concern around the eastern wetlands, I think they're much more dependent on having pretty high groundwater topped off with groundwater. What used to happen... the lake used to flood into these, that would help them top off, too. I know Greater Wellington at the moment, they are trying to correlate shallow groundwater out here on the flood plain with lake levels. It'll be a good piece of work when it finishes because it is a bit of an unknown... There was one school of thought which had shallow groundwater was trying to make its way toward the lake. When the lake was

low, ground water could move through and when the lake was high, effectively it was blocked and the groundwater stayed out in the flood plain. There is some work that can go towards resolving that. It could be another good piece of information that could tell you better how to manage shallow ground water. Another piece of irrigation is what goes back in. You suck the water out, spit it around onto the paddock, put it through cattle troughs, do all the things that you do with water and then what happens to it? It's either going to roll across the land... or it's going to go back into the groundwater. And in that case, it's not only what's happening here, but a long way back up in the catchment. Back in the Oporua stream, up in the Donald block is a whole series of water races that start up northwest of Greytown. I think something like 13,000 hectares is drained into [the water system] up there and that's pretty intensively farmed country... pretty intensively irrigated. All of that's ending up in the lake. It's not a case of what happening at the lake, it's a case in some cases what's happening many kilometers away.

Austin: So do you think the farmers are the main proponent of the pollution cause?

Interviewee J: Everything ends up in the lake. Featherston's wastewater plant discharges into the lake at the moment. I think Greytown's wastewater ends up in the Ruamahanga... everything ends up in the lake. South Wairarapa are moving to land based wastewater discharge. All the stormwater ends up in the lake. I don't think it's fair to say it's the farmers. They're part of it. Everyone's part of it. Trying to [divide up the blame] will probably keep somebody occupied for years. Realistically, a lot of life in the modern world has an impact on the lake. One of the things we are trying to do is reduce the impact. Looking at it more from that end, how do we reduce the impact, what can we do about it? How can we make the lake healthier?

Austin: What's your opinion on the current status of the wetlands, I guess? So, Boggy Pond, Matthews Lagoon...

Interviewee J: They're improving, you've been down there and seen all the spraying no doubt... Those willows *shows photo from 2006*

Austin: Is that before you sprayed them?

Interviewee J: Yes, that's them pretty much at their peak. The way the willows were invading the wetland was very worrying. Jumping forward to 2015... *shows photo from 2015 with dead

willows as opposed to the alive willows in the 2006 photos* And now that they're starting to collapse, there's a little bit of other stuff appearing.

Austin: So what native plants were you trying to make way for?

Interviewee J: One that I really want to see in there, is raupo in the shallow part of the lagoon and then sedgelands in behind it. What was happening is that the raupo was being pushed more and more out into deep water. It's not its ideal habitat, because the willow were in behind it. The willow was pushing raupo out into deeper water. It had already pretty much displaced other vegetation. It was also having an effect on the open water habitat... a lot more requests from duck hunters for example to spray raupo because duck hunters and waterfowl, like open water. Raupo is useful for waterfowl for molting, they like to duck in there and hide, but most of the time when they're feeding and loafing they're out on the open water. And, we'd get a lot of calls from people asking us what we're going to do about the raupo problem. Which left me thinking, 'I can see your point of view, but raupo is doing what it should do.' It's doing it in an unfortunate place because it's a refugee from the willows. One of the things we did was to knock out willows and... here's a photo you can see dead willow trunks and raupo sprouting up underneath them. So, once we've got that margin more stable, we can then sit down with people who know about bitterns and cranes and waterfowl and figure out how raupo fits into that system. We'll draw out a raupo margin. You should be able to keep it there... natives like the shevluducks, they have courture flights and they need a good stretch of open water. Dabchicks, swans, they all need good open water. But cranes, bitterns, rails, they like where the raupos growing in shallow water. So again where the raupo's growing in deep water, it probably wasn't ideal for the [bird habitat]. I think if we can pull the raupo back into the shallow water, we'll get something that... gives everybody a decent chance.... Little lagoons, another two or three years and they're gone. The willow canopy closes right over the top of them. And, they lose a lot of their values. One of the things about getting in the air, you see it all.

Austin: Did you spray all of those?

Interviewee J: Well this one's in Matthew's Lagoon, so we're tackling Matthew's now. There's an area here with a shag roost, we'll leave that alone, but [the rest of it] good that there's native vegetation, but there's little bits of willow displacing it. That's one situation that does cause me

huge concern, when the weed is bigger than the ecosystem I'm trying to protect. That's when I'm in serious strife... The willows have now turned grey, there's a lot more light reaching the water... There's a naturally endangered liverwort that's turned up under areas where the willows have been sprayed out I think it's a combination of being still in the water, because you are on the margins and high light. All I've got really is what I think is cause and effect... It's a pretty rare ecosystem in its own right, it's not hard to see though that there's a willow invasion here. So that's the big improvement on the edge wetlands... getting rid of the weeds, getting rid of the willows. Not quite getting rid of all of them, but making an impact. This is what the wetlands should be like, shrub lands, sedge lands, cabbage trees... We're getting there.

Austin: So moving on the barrage gate resource consent renewal in 2019, how do you think the gates could be operated in the future to better suit the environmental needs of the region?

Interviewee J: The big unanswered questions at the moment is fish. That's one of the reasons I brought up the Eastern Rumataka streams. And there's also the eels, but they're in a different habitat the, the tuna, as a rule. No, that's sorting out that fish passage. There's a big unanswered question. What sort of effect the gates are having and on the eastern lake shore, the current lake levels and the way the gates are operating, there's nothing to indicate it's having any bad effect. You know, the turf fields are still there, the sedge lands in behind them have taken a beating, but I'm not sure that altering the barrage gates would do anything for them... or if it's even necessary to do anything for them. There could as easily be an argument that the result of those sedge lands is the result of historic events. And, we'll find another way to sort them out rather than try to recreate those flood events I was talking about. We'll find another way to take care of, in this case, the weed invasion and try to restore those sedge lands into something that approaches their natural state even if we have to use a different driver to do it.

Austin: So the part of the river that's cut off... what are the environmental impacts of that and should there be something done about the stagnant water?

Interviewee J: Yes, I think it's... it isn't a fraction of the habitat quality it should be. The question then becomes how you do it, it needs to improve. Talking to a couple of farmers down here, I think the only thing that stops this from completely flipping is the water ski club, they run up and down it with large boats and towing skiers, and that's enough to turn it over. And there is,

one of the farmers down here is in the process of trying to put up a fence down here, he wants to put it on top of a small bund. And one of the places he wants to get material for that is out of the old channel. So, it could be by running a digger through here. Taking the material out and putting it over here for the farmer. That allows us to have some water running back up into the cutoff. And there's always putting the river back in.

Austin: What kind of effects would that have?

Interviewee J: I think that was a case of how you'd do it. Whether you put some culverts under the road and perch them a wee bit, so that there has to be a good bit of water flowing the Ruamahanga... you do want a bit of velocity in there... otherwise you won't be shifting the sediments around as you should. And I guess you've also seen the Victoria University Architect students work? It's pretty spectacular stuff in there. Some of that could be pretty far reaching. One proposal was to completely reinstate the Ruamahanga into its old channel and use the diversion channel as a flood channel turn that into wetlands... No, cause they haven't done any of the engineering, the good thing about landscape architects is that you can be pretty conceptual. And you need to get some serious engineering work to get some numbers for it. Essentially, if you were to reinstate the river and use this as your flood channel, whether it be some sort of control structure here I don't know, but it's certainly got my interest. There could be a time when you've got both of these control structures, but when the river was... boisterous. It would push through [the diversion], if you turn this into wetlands, you couldn't afford to push it too much through here, because if you put too much velocity on it, it'd rip your wetlands apart. Admittedly, that's what it did, that's what rivers do, they rip wetlands apart and they create conditions for new ones somewhere else. It hasn't got that stage anymore, you need a big stage for those processes to operate. What we've done is restricted the stage to a huge degree. So, if we're going to get those processes to operate we have to realize they'll be operating in a much more constrained fashion and make with the best that we can.

Austin: So, I guess kind of holistically speaking, what are the overall advantages and disadvantages of the current scheme?

Interviewee J: The big advantage with the current situation is that it's open to change and it's up to us to find a way to let these natural processes happen. And, still accept that this country here

doesn't... it's not likely to ever go back to wetland, so we've got to find a way to make the natural processes work inside a modern landscape. And, that's really at the heart of this planning mechanism.

Austin: If there was one thing you'd like to see going forward about the system, what would it be?

Interviewee J: It would be to build the natural processes in really quickly. And, admittedly, when the lake levels were set back in the early 90s, there was one natural process that was built into that really quickly and that was the wading bird habitat... Prior to that, the Water Conservation Order... recognized the values of the eastern lake shore as a good wading bird habitat. Building that in really quickly... what Hugh Robertson and co. found was that if the lake was too low, the wading birds weren't there and if it was too high, they weren't there... There seemed to be a pretty sweet range. That ended up being... not coincidentally... pretty deliberately... and that ended up being pretty much the consented levels for the lake, upper and lower, it was to keep the lake working within that range. Nature being nature isn't going to let that happen all the time so there are times when the lake will be lower and there are times when it will be higher. But for the higher and lower levels, the gates probably don't have much impact. That's lower... probably reflecting just lower levels in the river... dry summers. And higher levels are reflecting floods or... perhaps Onoke's blocked. They don't last long and over the years, they haven't had any huge effect. It'd be good to build the fish in. And, it'd be good to have a lot more understanding about how these lake edge wetlands worked. There's another group of plants I'm working on up at the north end that live right on the lake edge. Their problem as far as I can gather wasn't the water levels, it was grazing. Now that there's no grazing up on this lake edge, they seem to be undergoing a revival... Yeah they're doing alright.

Austin: So you'd like to see more natural processes taken into account, what natural processes specifically?

Interviewee J: The effective sustained high water levels on this edge vegetation. By sustained I mean, lake is up for like a month or two. I'd like to see if somebody could do a bit of work on that. Really... the problem there... is the wading bird habitat on the eastern lake shore. And, I don't know how we could operate the gates in a way that would enhance it. Certainly, from the

surveys, repeating the surveys that were completed for the setting of the lake levels and that's indicating that the way the gates are operating at the moment aren't having any bad effect. So, short of finding another way to get the Ruamahanga operating, it's hard to think the gates are doing anything that's... that the outcomes are that bad. It's only effect, I don't think it's having an effect that's causing any sort of massive collapse. Looking at the eastern lake shore... regarded as one of the most important parts of the ecosystem down there... and so it's still functioning and it's still functioning well. So current situation, it's not having any hugely bad effect. Again, we're talking about international migrants as well as internal migrants. There are a hell of a lot of other factors that could affect [the internationals]... things that could happen a long way from here. So even if there's a decline, you couldn't say automatically that it's all because of the gates.

Austin: So that's all we really have for prepared questions, is there anything else you'd like to discuss about the barrage gates and how they pertain to the whole ecological system?

Interviewee J: Yeah... take a big view... going back a long way, on a regular basis the outlet at Lake Onoke would block. This was called hinurangi. It was an important part of how Māori interacted with Wairarapa Moana. But you get a blockage, you get water coming back and out because it can't get out to the sea. Greytown... and the Papawai Marae, just east of Greytown, going into the past, the people of Papawai considered themselves people of the lake, because regularly the lake would get up to the marae... There's a blockage and behind the blockage the water expands. The blockage clears and the water goes out. It's on a massive scale and it happened regularly, that's why I referred to it as the lake breathing, you suck in a deep breath and cover the landscape... Exhale and it dissipates possibly into something even smaller than this. But, what we have now is much more constrained much smaller scale. You have a blockage, and much more regularly, the lake expands and drops, expands and drops, it still breathes. The process is still happening, but it's happening in such a smaller area that we can probably have a lot of influence over its detail. And, when it was happening on [the larger scale], it was only natural forces that were determining what was happening to the landscape. Now, it's us humans that determine what's in the landscape.

Austin: Do you think that's a good thing?

Interviewee J: Well it's up to us to make of it what we will and everybody's going to have a different opinion. If I was farming down here, the last thing I'd want was somebody trying to keep the lake high. So, it's trying to work all these different factors into an overall plan. That'll keep the planners occupied for a while. The good thing about having these discussions early is that you're not sitting in a hearing room trying to work this out. You get a lot of agreement before it even becomes a consent application and that means you've gone a long way toward sorting these details out, working out how we can all live in this landscape.

Austin: You think it works pretty well then currently? Other than, you'd like to see the water levels higher for certain extended periods of time?

Interviewee J: Yeah, I'd love to see what that did, but I won't turn up in the court whimpering if it doesn't happen. It's a case of seeing how these natural forces do function in this pretty small area, but there are other ways of doing it, a lot more expensive and a lot more extensive, same result... similar result not exactly the same. And we're doing it really to a pretty large degree... these wetlands *points at map* we're not really set on letting nature take care of it. We've had to get in there and do some pretty intensive work. At the same time, we're not trying to pretend that letting the lake flow into [the wetland] is something that would do it for us. This is the end result, there is some major landscape changes over the last many decades. And, there isn't a time when... I could've said it's much worse. You would've heard about the polder scheme.

Austin: On the eastern side?

Interviewee J: Yeah

Austin: They did on the western side right? Some of those lands are poldered?

Interviewee J: The plan was to go right up here *points at the map a good distance off the current eastern shore*, put a big bund in and pump everything over to the other side and turn these, probably into dairy farms. But, that didn't work. That would've been a mess... completely taken out all the eastern lake shore and all its habitats would've gone. So, we're starting from a much better situation than we might have. So, largely, what I'm trying to work through at the lake is all pretty marginal. And, as I've gone through it, I haven't yet come to a point where I've said if we operate the lake differently, it will have this effect... Maybe my view of the world,

you know 'this is what we've got and we'll make the best of it.' But, what we've got down there, really, it's still functional. It's still a functioning ecosystem and I don't think we do need to have any fundamental changes... whereas, say boggy pond, we did have a pretty broken system, but, that's the end of a long period of disruption. And, it's fixable, it takes an effort, but I couldn't point to flood protection and say you caused it. So, I can't really point to flood protection and say well now you have to fix it. And, I guess you would've seen *inaudible*... she did a serious piece of work on sediment depositions, that's worth reading. She brings out three distinct periods of sediment deposition in the lake associated with pre-European fires, European fires, post-European fires associated with clearing the hills and the last bit of deposition was in here, associated with the Oporua spillway and that lower valley scheme. That's another aspect of the lake. I don't know who'd be the best person to look at it... Two big features of the eastern lake shore, it's being built up by river deposits. You'll get people talking about sediment in the lake quite regularly as though it were a problem, but it's the sediment in the lake that built up the eastern lake shore, so again it's part of the process. The other thing that trumps all, I don't mean 'Donald' *laughs* sorry, I had to slip that in, I've been serious this whole time... But then you will have seen that bit there known as the Wairarapa fault line and heard of the 1855 event. Did you see it down at pigeon bush?

Austin: Ian showed us something, we were down at Lake Ferry and we looked across and there was a very defined plateau...

Interviewee J: That's part of it... at pigeon bush, you can see in the creeks, it is quite a famous geological thing, you can see in the creek the offsets, the creek comes down... and then it jumps up and you can see the vertical offset too and that happened in a matter of seconds... It's being described as the effect of that fault line... One of the geologist described the area as tilting west to east. So, the effect of... there's fault lines running all through the place, it's New Zealand after all, but the effect of shakes along this series of faults, is to lift the western side of the lake relative to the eastern side although both sides of the valley are lifting... the center not as much, but, the valley is tilting. If it tilts a bit more... another big shake on that fault line, would that be enough to flip the whole lake a few meters to the east by lifting up its western side? In which case, all of our thoughts and everything else, they disappear and they start again. Big natural events that are beyond our control. I do hope though that I'm not here to find out, but it'd be a

hell of an event and, it's natural events that have made the lake the way it is. It probably is that sort of east west tilt... when you think about it, it's a bit of an unusual way for a lake to operate. It isn't the sort of case where water comes in one end and goes out the other... Relative to the size of the lake, it's a tiny little isthmus between where the river came in and where it came out. That really was shaped by the geology. As much as humans think they can, we can't control geological forces yet... as much as we think we're in charge.

Austin: Some pretty scary, interesting thoughts.

Interviewee J: You get like that when you work with nature for a while. I reckon it's good for the ego, puts you in your place pretty quickly.

Austin: Do you have anything else you want to tell us? We're just writing it all down at this point.

Interviewee J: ... But I think a combination of good design and a bit of good luck. Over the last 20 years, we've pretty much managed to work within the system. Again, I'm mostly talking the eastern lake shore. We've mostly managed to work within the system without wrecking it. And, it could so easily have gone wrong, could so easily have been wrecked. But, we've managed to keep its natural values... intact and still get what the humans want. I think if we use that as a template, the next 20 years, we should be able to build on it. There will be times when the imagination has to have a bit of a stretch. You put the imaginatives and the engineers in the same room and you might come up with something that's beyond either group individually. Whereas, the situation we have now, it was largely the result of turning a bunch of engineers loose. Those old photos, you see Poinui Lagoon doesn't exist. This whole thing was an arm of Lake Onoke. That farm, none of that existed, it was all big wetlands and such. You put a massive dredge in there. That's right, I did get a bit lyrical once, I described that as... putting the dredge in there as ripping the heart and guts out of the system and using its entrails to imprison it. I think the engineers got that. An engineering solution to what they saw as a problem and realistically in those days, the damage to the natural processes didn't even form part of it. Just get in there and do it. And, now, we're much more conscious about working inside the natural systems, or alongside them. It did give us Ponui Lagoon, that's another discussion that's on the horizon. We've got a really neat freshwater wetland and if we play around with... It's cutoff by

floodgates and other things... If we play around with its hydrology, it may turn back into what it started and that's a piece of salt marsh. So it will lose a lot of its fresh water values and it'll become salt marsh values. So, I'm glad that I'm not having to think too hard about that, because it's fresh water values are pretty immense, a lot of stuff in there. Having said that, salt marshes are pretty valuable places, too.

Austin: Who ultimately decides I guess?

Interviewee J: It'll be... it's a Wairarapa Moana discussion, but, at the moment, it hasn't really had a trigger. Somebody will come up with something and it might be that... the stream that drains into it... it might be the fish numbers up there aren't doing what they should do and that might be because there's a block down here and to fix that block up, it might require turning this whole thing back into salt marsh. There is some work going on to turn a lot of this low lying country here back into wetlands.

Austin: I think we should probably get going because Ian's wife is out there waiting for us.

Interviewee J: No, thanks guys!

G. Interviewee K

Interviewee K: So has Ian explained the process regarding how we set those water levels? Is that what your questions are about?

Jeff: That's not what our questions are about, but he kind of explained it, but not in full detail.

Austin: What was the process, I guess?

Interviewee K: Well, we formed a committee of users of the lake and over the course of about a year or two... we discussed what the water levels would be or should be and then tried to get a regime that suited most of the users, because there are all sorts of competing demands for the lake level. The farmers like the lake level high in the summer so they could get water for their stock, but low in the winter so they've got flood protection. The duck shooters like high water levels around the first part of May when shooting season starts... The yacht club wanted reasonably high water levels in the summer when they were yachting. And the birds, it's best to have lower water levels late summer when the greatest diversity of birds are there... all sorts of competing demands... Here, we are drawing out the water level in the summer, it was good for flowering native plants, good for the vegetation, so there are all sorts of competing demands and obviously the regional council wanted to have flood storage in the lake as well. So, yeah, it took a long time and everybody at the beginning of the process was quite weary of one another I suppose, and there had been battles in the past between the farmers and the catchment board... and between the wildlife interests and so forth, but, eventually we got to sort of a compromise position where everybody seemed reasonably happy and no one objected to the water regime that was promoted to the regional council. You know water rights...

Austin: Was that the Wairarapa Moana?

Interviewee K: It preceded that. So Wairarapa Moana is a more recent guidelines I think. So just Lake Wairarapa Management Guidelines I think that we'd produced that Ian should have a copy of.

Austin: So did you guys come up with the water levels for the Water Conservation Order? Or is that different?

Interviewee K: Well there aren't specific ones in the Water Conservation Order, but there is for the water rights to operate the barrage gates. So, they needed to advertise what water levels they were aiming for in their water right application. And there were no objections to that which we were pleased about because they were expecting, had we not gone through that process... a long legal sort of battle over water levels.

Austin: ...What is your job title?

Interviewee K: Principal Science Advisor

Austin: What does that pertain to?

Interviewee K: I supposed primarily an ornithologist, but I provide scientific advice for the department on a range of things, but, primarily to do with birds, especially kiwi.

Austin: How long were you involved in the Wairarapa region?

Interviewee K: I started... 1984, and I've been involved since then... so 32 years.

Austin: What do you value most about Wairarapa Moana?

Interviewee K: Open spaces and good bird watching, good bird habitat.

Austin: What's the importance of Wairarapa Moana to DOC?

Interviewee K: High biodiversity values, especially wetlands, we've lost so many wetlands in New Zealand... I wouldn't call it a very natural wetland, but it's a large wetland and it's got high values.

Austin: How does Wairarapa Moana provide for the community's needs?

Interviewee K: Well, it provides water for the local farmers, it provides flood protection for the Wairarapa valley. It provides recreational activities for yachtees and hover crafts and... I'm not sure the hover craft club is still in action, but it was in 1989... And, recreational use by bird watchers and botanists... It also has a small fishery as well. Commercial fishery as well as

recreational, but relatively underused as a resource. That open space means it's sort of a hostile environment too. On a windy day it can be pretty horrible down there, there's not much shelter.

Austin: How does the flooding, or the current lack of flooding, affect the wildlife in the region?

Interviewee K: Lack of flooding, mmmm. Well the lack of flooding affects the farmers more than the wildlife. When the lake levels are very high, some of the wading birds have to leave the lake and they feed on nearby pasture for a while, but if the lake stays high for a while, they move on to other estuaries and often don't come back for the summer. The main species involved would be the *Batail Godwit* and the *Eastern Golden Plubber* so those are two species that feed on the lake shore. When the lake levels come up, they sort of basically have to leave the lake and then they often don't come back for the summer.

Austin: Do you think that flooding is a major issue currently?

Interviewee K: Well, I think the regime they've been operating in the past 20-30 years, they haven't had any major flood events, I mean they've had floods... but nothing major that would've damaged households or farm practices, you know stock getting washed out to sea or anything like that. So it's been fairly well managed.

Austin: So the Greater Wellington Regional Council has done a good job managing it?

Interviewee K: Yeah, I think so. I think having a water regime with much lower water levels in the winter gives it that capacity for flood events. The main issue that they deal with is with southerly storms closing Lake Onoke, then they can't let water out of the lake because Lake Onoke is sometimes higher than Lake Wairarapa itself. Then, in those circumstances... there's a scope to get horrible flooding if a near tropical cyclone came down or something. Yeah, heavy rain when the lake's already high because it'd been blocked by Onoke spit basically.

Austin: What do you think of the lake water levels?

Interviewee K: As far as I can tell they seem to be working reasonably well. It's hard to operate exactly to those water levels, because they get rainfall that pushes the lake up. I think it does provide that capacity for flood water in the winter. It seems to be working reasonably well for the birds. Yeah, it possibly runs a little bit higher than I would desire, but part of that's purely selfish

because when we do our bird surveys, we like the lake below 10.3 meters or we get all wet and tired. In fact, the water levels should be below 10.3 because... target levels were set below 10.3, but it seems as though the levels are quite often at 10.3 for a lot of the spring, November/December, and then it actually comes down so I guess if anything, I'd like to see them come down towards those target levels quicker than they currently do, but overall, it's a lot better than it used to be because pre set levels, sometimes the lake would sort of dry up and you'd have dust storms and the whole lake would go down to 9.7/9.8 meters above datum. You'd get huge sand flats exposed and the wind would come blow it about like a Midwest dust storm.

Austin: So if there was one thing you could change with the target water levels, what would it be?

Interviewee K: I think the targets are still okay, it's just how quickly you get down towards the target... I think we tried to get them down to 10.3 as fast as possible and then draw them slowly down to the minimum levels. I'd prefer to see them drawn down toward the minimum levels faster than they currently do. As I say, it's primarily for selfish reasons rather than for wildlife.

Austin: When you set the water levels, did you take the fish into account?

Interviewee K: We did and we commissioned, I think the ministry of fisheries... to do a report on the fisheries. Yeah, so fish passage... we discussed that there should be more done to having fish passage available at all sorts of levels of lake. I don't think that's ever been put into place.

Austin: What's the state of the water quality in Lake Wairarapa?

Interviewee K: I wouldn't drink it. No, it's probably not brilliant. I know on a hot day, you're walking along and parched, but you can't drink the water because you'd get something nasty. So the water quality is still not good and that's related to turbidity and because it's very shallow and the wind sort of mixes it up a lot. There's a lot of stock runoff into the rivers and then into the lake itself.

Austin: Do the barrage gates have any effect on water quality?

Interviewee K: Only I suppose that they don't let salt water into the system... as much as there was pre barrage gates anyway... I don't know, I mean it affects the quality of the water, but not

in a negative or positive way. Bacteria and things like that, salt water can be cleaner than freshwater... yeah.

Austin: How could the water quality be improved?

Interviewee K: Well I guess exclusion of stock from the lake itself... It's a very long shore and it's difficult to do that all the way around. And, you know water quality of runoff into the river's catchments as well. A lot's been done, but I still wouldn't want to drink the water.

Austin: What are your views on irrigation?

Interviewee K: Well it's a necessary process if you want to farm that sort of dry country and you're basically recycling water for the lake and it eventually gets back into the aquifer so back into the lake system itself. So I don't really have any problems with irrigation, or the sort of scale it can operate. If they were just sucking out half the lake water every day to irrigate the whole Wairarapa Valley then it might have a major effect, but the level at which it's being done has no effect really as far as I can tell.

Austin: What's your opinion on the current status of the wetlands on the eastern shore?

Interviewee K: Weed is a major problem still. And things like giant fescue... willows... there's some good willow control already being done recently. But, it's still a very introduced vegetation environment rather than native, but there's work going on in the Wairio block to reestablish natives and things like that, but yeah more could be done. But, I think there's still opportunities to do better weed control, particularly the tall fescue. And I don't think grazing is necessarily incompatible with that. At one stage... where the Oporua spillway comes out... the property directly to the north of that was quite intensively grazed with sheep and cattle. And now that's very lightly grazed and it's not so good habitat for birds... I suppose when the lake level comes high, you just get long grass now so the birds just have to leave that area completely where they used to use the pools and that sort of grass land and, down on the southern block, below Willow Island, they've cleared a lot of the sort of rough vegetation there, it's now open pasture. But that's now used by waders and turns and things like that... It's a very non-native environment still. Except for those marsh type communities.

Austin: So can you explain the conservation efforts that are currently going on regarding Lake Wairarapa?

Interviewee K: Well I'm not familiar on the ground now with what DOC or the regional council are doing. But, there's replanting in the Wairio block with natives and establishing a good water regime in there, but I don't know if DOC is doing a lot in JK Donald and things like that. So yeah, I probably don't know a hell of a lot aside from that Wairio block.

Austin: Do you think there is a need for more antipollution measures to be taken?

Interviewee K: Yes, but I'm not quite sure how... Excluding cattle from the lake would be the key thing you could do, but I'm not sure what percent contribution that has with runoff from the feeder rivers... I see cattle on the lake, but I don't see cattle on the streams coming into the lake. The regional council would be the best place to know what the best numbers are in terms of pollution, I'm not too well placed to answer that... One of the difficulties obviously is that with the lake level fluctuating so much, if you have cattle or sheep grazing near the lake, they could be excluded from the lake, but then the rises half a meter and covers the pasture, which they've pooped all over. Then, all the feces run into the lake itself as a result of that... You've got a lot of swan and goose defecation along the lake as well and in the lake.

Austin: So bigger riparian zones then?

Interviewee K: Because it's such a flat environment... the Lake comes up only half a meter and it covers 400 meters of the shore. So, it's difficult and it's not... the sheep and cattle actually make the environment better for some of the plants and some of the birds. So having maybe a cost and benefit of having grazing, you have some benefit from keeping the tall fescue down and the weeds down, but the cost is that you have extra nutrients going into the lake, but again, the regional council would better know what contribution farms have with ducks and geese and swans because how many cubic meters of dry matter get through a year, I don't know.

Austin: So, going back to the barrage gates, how does the operation of the gates affect daily life in the Wairarapa region? ... Of people.

Interviewee K: It probably doesn't affect... most people wouldn't even notice, but the local farmers obviously are very conscious of what the water levels are in the lake. As well as many users... recreational water users as well as the fishermen, but I expect the vast majority of people in the Wairarapa don't even know that the barrage gates exist or what their purpose is, but, that's a guess.

Austin: How are the fish important to the DoC?

Interviewee K: I guess we're primarily interested in the native fish in that system, eels would be one of the key ones... Galaxids go into other rivers and things like that. I'm not a fisheries person so the other Hugh Robertson is probably the better one to talk to about that.

Austin: Do you think they're being impeded by the barrage gates though, the diadromous species?

Interviewee K: At times they would be, like when they have the gates closed or when there's a really strong run of water out, but for a lot of the year, the gates are semi opened, so there is some flow through and not so fast that the fish couldn't swim against the current. And, there seems to be good numbers of eels in the lake that I'm aware of. Not that I see a lot as I walk around, but I haven't heard any squeals from the eel fishermen saying there's no eels left in the lake.

Austin: How do you think you could mitigate any negative effects that are being caused on the fish by the barrage gates.

Interviewee K: Well having fish passage permanently there and open would be important and is something that we have talked about. I don't think it's actually being done that I'm aware of.

Austin: I think there's like a hole in...

Interviewee K: ... The gate. Yeah, it probably needs a separate system, just beside the gates or even with a ladder system on it to account for different water levels so the fish can sort of cross if they want to. I don't know if they've got a hole, whether or not they could put a camera on it or something like that to see what sort of measure... To see what the flow of fish is to and from.

Austin: What do you know about the resource consent for the barrage gates, the renewal in 2019?

Interviewee K: All I'm aware is that it's coming up. And, they've been talking to local iwi about if they're happy with the conditions as part of increased engagement with iwi about resource management in general. We did have representatives from iwi involved in the original setting of the levels, but I guess peoples thinking has moved on a bit over 25-30 years. So I guess it's an opportunity to vary the water levels if we so desire, but, I haven't heard anyone saying that we've got to have the lake a whole lot lower or a whole lot higher... They set the water levels in '89 or '90 and they've had one renewal of the water right since then and again no suggested variation. So yeah, I guess it's under discussion as this one comes up, but I'm not aware of any calls... but if you are, I'm interested to know.

Austin: I know the iwi are interested in just more natural systems so keeping the gates open as much as possible.

Interviewee K: Part of the problem with keeping the gates open as long as possible is that you can then get all those aggressive introduced weed species... that helps build the shore further and further out. So part of the reason for the higher water levels was to suppress weed growth as well. Over the summer, we have a target of 10.15 or 10.1. And that was to try to suppress weed growth over that summer period. Under the old system that was much more natural, you'd get more weed growth out into the lake and once you got weeds established then they trap sediment and it turns it into dry land rather than lake... The regional council did some pretty good forensics and I don't know if they've repeated them recently but... you can visually see how the shore is going further and further toward the middle of the lake over time and yeah it's just the exotic tall fescue first... and then they trap the sediment and it goes out further and further into the lake.

Austin: Is that on the eastern edge?

Interviewee K: On the eastern edge, yeah, and also around Tauherenikau Delta where the Tauherenikau River runs out. That's probably moved out 500 meters over the last 30 years into the lake. At the Oporua spill way, if you drive along the north bank... you come down from the

stop bank down towards the lake, at the end of the stop bank... there used to be little pools and birds would be using those pools and marsh turf. Now, there's a whole paddock there fenced off which would've been lake shore 30 years ago.

Austin: The paddock, a farmer bought that land? After it was already...? Or like a poldering?

Interviewee K: No, it's not poldered, it's just some fenced off part of the shore because the shoreline's moved so far out, it's sort of become dry land and that's partly because when they open the Oporua spillway during a flood. A lot of silt and debris comes out. As it hits the lake it settles because it slows down and builds up...

Austin: Now going down from the Oporua spillway, the Ruamahanga Cutoff, what are the environmental impacts of the river being cut off?

Interviewee K: The upper part of that looks pretty stagnant to me. I haven't spent much time up there. I go to about where the cutoff hits the lake and walk the lake shore from there rather than battle through the weeds... upriver. But, from where I've seen it, it does look rather stagnant. So there's not much water flow into there.

Austin: What are the environmental impacts of it being stagnant?

Interviewee K: I guess it's just like algal growth and things like that in there.

Austin: Is there anything that could be done to mitigate...?

Interviewee K: If they could reestablish a flow into there on a regular basis, if you have flow in and out of the lake... I mean the lake is pretty much cutoff, I mean there is a narrow channel... but when the lake comes up, I don't know that a lot of water gets into that back water. I think they have had various pumping projects, pumping water into the top of there... I don't know how much flow that creates, but yeah...

Austin: So I guess just generally speaking, what are the advantages and disadvantages of the current LWVDS?

Interviewee K: Advantage would be that it's prevented serious flooding in that lower valley. It's created sort of a stable habitat for wildlife and plants and all that... And, I think it's created a better environment than what we had. So, 40 years ago then. The disadvantages are that the whole system is quite unnatural, in terms of plants... it's dominated by exotics and the isthmus, more salt water gets into the system compared with 40 years ago and you know that may be disadvantageous to some species, but, generally, it still has very high life qualities.

Austin: Are there any other issues you can think of, regarding the scheme?

Interviewee K: ... Nothing really, umm, no it's a complex system, but I think that the solution that we came up with 25-30 years ago, seems to have operated reasonably well over that period. But, my views don't necessarily include fisheries and what changes they've had on fisheries... I think much more could be done to improve facilities for recreational water users. This could be more nature interpretation and trails and things like that for botanists... But yeah people have talked about having cycle trails around the lake shore and it's just not the right environment for having cycle trains I think, perhaps on some of the stop banks you could have cycle trails. And, there's been a lot of good weed control, but it'd be nice to see more natives replanted in the area.

Austin: Yesterday we talked to Tony Silbery and he was explaining all the work he's been doing to get rid of those nonnatives.

Interviewee K: Well there's enormous willow forests in some of those reserves. I mean I guess they're good cover for waterfowl and things like that in the past, and they're probably quicker establish... easier to establish them.

Austin: Do you know anything about the Ramsar status of the lake?

Interviewee K: Uhhh, I know that there's an application by the regional council and the other Hugh Robertson... has been assessing that proposal and hopes to assess the proposal and add some extra information. I haven't heard that it's been officially agreed to yet, but I think it's getting pretty close.

Austin: And you support the application?

Interviewee K: Yeah. No, it certainly meets the criteria.

Austin: So I guess with the operation of the barrage gates and the resource consent and everything, if there was one thing you would like to see going forward, what would it be?

Interviewee K: I guess exotic weed control would be the key to try to establish more native vegetation on that eastern shore in particular. So still better ways of controlling tall fescue and maybe even as they've done at Wairio, get in with bulldozers and create some wetland habitats. And perhaps some of that could be applied further north along the eastern shore as well.

Austin: That's all the questions we have, if there's anything else I guess you just want to mention about the water system...

Interviewee K: ... I did monthly counts on the eastern shore for ten years from '84 to '94. Now they're repeating those counts but doing them three times a year... Bird numbers seemed moderately stable over that period. Some plusses and some minuses but generally that has to do with national status rather than local status, but one of our endemic species that uses the wetlands behind the lake, but come out into the lake occasionally, the dabchick. That's hugely increased in numbers... or certainly the use of the lake has increased.

Austin: Due to the water levels? The scheme?

Interviewee K: It may actually be due to improved water quality, if anything. Or could just be greater predator control going on, it means that they've been breeding well in those, JK Donald... Boggy Pond... Matthews Lagoon area, but, we've had record counts. We had one count last year of more dabchicks that we thought existed in the whole of the Wairarapa so, and that was just in the lake itself, so that was encouraging. Yeah, it may be something to do with water quality, but I can't detect any visual change in the water quality...

Austin: It seemed pretty stable over the past?

Interviewee K: Well it hasn't got a whole lot worse, I wouldn't drink the water 30 years ago and I wouldn't drink the water now... I think I actually have drunk the water and it didn't actually have any ill effects. I forgot a water bottle or something like that. The regional council do take readings of the water quality down there, so I haven't seen any trend information to know if it's getting better or worse... but it doesn't look a whole lot better or worse to me.

Austin: Because it's kind of a shallow...

Interviewee K: Also, water quality is very hugely dependent upon what's happening upstream in terms of rainfall and things like that... How much water is flushing through the system, but we've had a fortnight without any rain and so the water quality is probably getting a lot worse at present because there's probably very little flowing in and out. So have you seen water quality data? Ian Gunn would have it.

Austin: I think we got water quality data, I honestly don't know much about what it means.

Interviewee K: I've never seen evidence of a mass die of fish or anything like that in the lake... No lack of oxygen or anything like that. I mean there's always good turnover of the water.

Austin: I feel like it's got a lot of surface area so that helps oxygenate it?

Interviewee K: Yeah. and, it's so shallow, it's like a saucer, when the wind blows it churns it all up and it goes very brown very quickly in the wind.

Austin: So I guess that's all we have.

Interviewee K: Yup.

E.3 South Wairarapa District Council

A. Interviewee L

Jeff: What is your occupation?

Interviewee L: Mayor of the South Wairarapa district

Jeff: Where do you live (city and region)?

Interviewee L: A kilometer outside of Featherston

Jeff: How long have you lived in the Wairarapa region?

Interviewee L: 18th year living here- actually from wellington by birth

Jeff: Can you describe your role in the South Wairarapa District Council?

Interviewee L: Mayor is head of council, the next part as mayor is they are a community leader. Wairarapa is a very diverse community as it's very rural in nature. Involves everything from being a community advocate through making sure carrying out the wishes of the council

Jeff: How long have you been the mayor?

Interviewee L: 4 terms

Jeff: Have you made any big changes in your position?

Interviewee L: Our council has yes. We are in the middle of changes to discharging waste into water into discharging to land. We purchased 3 farms at great cost. The water goes through some treatment beforehand but it does contain many nitrates.

Jeff: Do you know what lakes/ rivers

Interviewee L: Basically all go into the rivers which all feed into the lake. Martinborough discharges their waste into the Ruamahanga River. Greytown discharges their waste into the tributaries of the Ruamahanga River. People seem to think that the waste water that goes into the

lake now is polluted but isn't bugs it's treated, it's the nitrates. But it will take 20 years- it's a small community and they've got to be able to afford it

Jeff: What do you value most about Wairarapa Moana? Why?

Interviewee L: I think it's the amenity of the wetland in the whole district it's an integral part of our district. Very hard to pick one value, the amenity as a whole, encompasses its role it plays environmentally for wildlife, plughole for the region, economic value- land around it's that farmed and the water that is taken for integration

Remove any – huge impacts on WM

Jeff: What is the importance of Wairarapa Moana to the South Wairarapa District Council?

Interviewee L: Environmental issues are not part of our role. We really deal with the people things. Its importance to us as a council is actually quite minimal. For the people we act as community leaders for, it would have a n impact economically. As a council, strictly speaking it wouldn't matter if it wasn't there.

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Jeff: How does Wairarapa Moana provide for the district's needs?

Interviewee L: Recreationally, quite definitely people use it for walking, fishing, there's a little bit of boating, it is a wee bit dangerous for that. As for farming, there is irrigation. If you look at iwis role, they use it for food gathering, not as much as they used to but there is still a requirement there for them. Otherwise, once again, it's something that is just there, it doesn't actually, if you took it away it would probably more of an impact on the farming economy but on people's day to day lives in the south it probably would make a lot of difference, unless, they are particularly interested in the environmental side of things and the flora and fauna that survive around it.

Jeff: How is Wairarapa Moana used recreationally?

Interviewee L: Absolutely it is. As I've said before walking, fishing, bird watching, some boating, you can swim in it but it's a wee bit muddy on the bottom but it's quite safe to swim in if it's not windy. So yes definitely, it is used recreationally. Duck shooting and those sorts of things.

Jeff: How do you view the water quality in Lake Wairarapa?

Interviewee L: It's not, when you look at the lake you get the impression that it's not crystal clear and people sometimes think that it's degraded and unsafe but it's a very shallow lake and has a muddy bottom so it doesn't take much of a breeze to chop it up and turn it brown. So my interpretation as a layman looking at the water quality is that it's not that bad. It is a shallow muddy lake. It's not like Lake Taupo, a deep volcanic lake where you get beautiful crystal clear water and trout swimming up to the end. So I understand that the nutrient levels are higher than they used to be but it's certainly not a lake that is verge of collapse because, you know, the water won't sustain life, it's a long way away from that. And we still catch flounder, etc. so it cannot be too bad.

Jeff: What are the SWDC's views on fishing and maintaining native fish populations in Wairarapa Moana?

Interviewee L: Well, we don't, as councilors, it's not something we get involved in so this would be my personal opinion not SWDC's opinion. I do have to differentiate because otherwise I could get into trouble with my colleagues, saying hey we haven't discussed that. But I have as an individual, I have no problem whatsoever with people fishing on the lake. It would be good to rid it of pest species I think. It's more important to me that we have a good native fish population than having recreational fishing, but I think it's just about impossible to rid it of pest species such as perch and mud and I've got no idea how you could possibly get rid of them in a lake that size. I think we would probably have to work it so how we can minimize to the native fish species a chance, but the likelihood of getting completely rid of them is about zip.

Jeff: What do you know about flooding in Lake Wairarapa?

Interviewee L: I know that the whole area used to flood basically it was a big flood plain and that the earthquake in the late 1800s lifted the lake bed and changed the flooding patterns and its very productive land and in the 1950s the lower valley development scheme was put in to stop the main flooding. And this has affected the way the lake operates and it has affected the wetlands but I guess that is a price that has been paid for it. Progression or development or whatever. At the time I guess they didn't see it the lakes ecology as being important. Now, some people see it as being more important than the economic value of the land around it that now no longer floods.

Jeff: Do you think flooding is a major issue in the region?

Interviewee L: It is an important matter. I wouldn't say it is an issue. Certainly we have floods and when we have them they are pretty solid, but in 15 years I've been in the local government we have had two big flood events, only one of them caused grief through the valley, the more was more localized on the coast and I don't think that any amount of work that we can do will, I would cost so much money to stop flooding completely, people couldn't afford to stop flooding, so we have to manage it I think with what we've got.

Jeff: Do you think flooding is well-managed?

Interviewee L: I think it is reasonably well managed now. Whenever you have got human s making decisions afterwards people always can say if we had done that then and that then. But I think as it is at the moment, it's pretty well managed, there is always times when you can do things a bit differently, If you live on the edge of a lake or the edge of a river, then flooding is something you have to be prepared for, If you are not then you should live on the edge of a lake of the edge of a river.

Jeff: What do you think of the current lake water levels?

Interviewee L: As an individual I don't have an opinion. What I hear from farmers depending on which farmer, there is always a farmer that wants it higher or lower. I'm not qualified to talk on whether they should be higher or lower. You know, the duck shooters, there always want it higher for duck shooing and the eagle hunters want it lower. So I think the Greater Regional

Council does a reasonable job of managing the lake levels now but yes there is always criticism depending on which camp you are in.

Jeff: Would you like to see it change? If so, how?

Interviewee L: Well really what I've said in the previous question, I'm not qualified to know whether they should be up or whether they should be down, but I put my faith in GWRC actually having the knowledge of the environment to know when species need a bit more water and when they don't and obviously there is a huge economic investment in those farms around the lake and regardless of how perfect we want the environment we also have to take cognizance, otherwise we being the country have to be prepared to pay some massive compensation.

Jeff: What are your views on irrigation in the region?

Interviewee L: I think that it's a great thing to manage the water, to be able to store water when its available and manage its distribution. I think a lot of the fear about irrigation, meaning that we are going to have thousands of more dairy cows and runoff, and that's proven to be incorrect in many places and I believe if we do have irrigation, if we are fortunate enough to be able to bring it to Wairarapa then as part of those irrigation permits, I don't know what we call, consents, Will be a requirement to manage runoff so if it won't be matter of pouring thousands of liters of water on your land and having crap runoff into the river. I know that there will be, if you're going to irrigate, there will be a requirement to manage runoff and also to modern farming practices. I mean farmers don't want to be spending money unnecessarily chucking fertilizer on their paddocks to have it mix with water and run into the river, that's poor farming I mean. They, I mean the majority of them. They're very aware of nutrient values, and putting on only fertilizer that is needed. It is very different way of farming compared to the old days we just used truckloads of nitrogen so yeah I think irrigation is a good thing if it is managed properly.

Jeff: What is your opinion on the current status of the wetlands?

Interviewee L: I think its needs work. We know there are a lot of pest species in there both alive and flora, trees, you know, elders, weeds, the old practices of having stock grazing right up to the lake edge, it was all very acceptable, its fine for us to point the finger at farmers. For a long time, people thought that was okay they thought that having grass grazed right down to the edge was

better from a fire point of view, all those sorts of things.. So there is definitely work to be done, but certainly the farmers that I know, the majority of them are very conscious of the environmental pressures and a lot of them are putting money and effort into trying to upgrade the lake edge and so I think yes we need work but like I also don't think it possible to take it back to what it was a couple hundred years ago we've got to have a compromise, we just do because the only way to do that is to take the humans away.

Jeff: What is your opinion on the Ramsar status?

Interviewee L: Our council supports that, and so we've , I've been to the presentations that the GW organized, bringing down a farmer from the Waikato whose property borders a Ramsar site and he is absolutely adamant that it hasn't made any to his ability to farm and that the environmental practices that he is required to meet, he would have had to meet anyway, so I believe that if it helps bring, I guess our site to the notice of the world, and it means that we can perhaps access some more funding and get know how from other parts of the world then that's great. As long as it's not suddenly going to cause a whole bunch of grief to our farmers around the edge of the lake because they play an enormous part of Wairarapa economy.

Jeff: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee L: Just the work that DoC, GW, and our do through the Wairarapa Moana group. Obviously, DoC has got a slightly larger scope than that, but the Wairarapa Moana, I'm on the governance group and so that's the work I'm aware of, not of anything outside of that.

Jeff: How important to you are conservation efforts regarding Lake Wairarapa? Why?

Interviewee L: I would say very important, I'm one of those sorts of people that love the environment I want to see a good healthy ecology out there with its native species and varied environment. But, I don't believe we should necessarily have to, I don't believe that we can turn the clock back to how it was, you know, 200 years ago. Human settlement is here we need to be able to farm, we need to produce food and whether its corn or cows, there is still an impact on the environment. So I would, Environmental matters for Lake Wairarapa, for me, is very important. With the proviso that we also have that we also have to consider other things at the same time

Jeff: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee L: I think that what we have is good, however a lot of it has been, I guess voluntary, and I think that there is through the new proposed regional plan there will be much more focus on I guess rules and prosecutions and those sorts of things. And while to me that's not ideal, it's probably what we need to make a difference because the people that are interested enough that are interested enough to step up, they have and it's the ones that are left, if they haven't stepped they are going to need the big stick. I'm not a great believer in big sticks, I prefer the carrot, but I absolutely understand that sometimes you need a big stick. On rules, while not ideal it's that we need to make a difference. If they haven't stepped up they need the push. Sometimes you need the big stick

Full transcription ends here due to recording malfunction

Jeff: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee L: Know when it was built before the GWRC- WC there was government money put into it- subsidized- not much thought a all put into the environmental impact- has caused some grief with iwi- how much that really impacts – they want to reclaim this but it's not as important to them as the principles. Making a big thing of it because of the traditional fishing – not entirely sure they would go back to that. Whenever you get two people in a room, you hear a lot of complaints... It has certainly contributed to the environmental impact of the land...

Jeff: What do you know about the Barrage Gates?

Interviewee L: Used to control the lake levels- that they are very old and their consent is running out

Jeff: Does the operation of the barrage gates have any impact on the activities of the SWDC?

Interviewee L: No

Jeff: What do you know about the Ruamahanga cutoff?

Interviewee L: Not very healthy at the moment- flow of water into it is sluggish- iwis and others want some flow of water so that it becomes healthier- personally not qualified to comment. If there is some way we can make it healthier without a ton of money or damaging something else- I'm in support

Jeff: What do you think of the diversion of the Ruamahanga River?

Interviewee L: Not a lot of thought put into it- been in place since the 50's- for a lot of people it's always been there- to change it it would be a major- the benefits would have to be huge to warrant changing it.

Jeff: Being a site for recreation, what is the appeal for maintaining the current conditions of the cutoff?

Interviewee L: People jet ski on it- not my thing, it's not a very healthy piece of water- to me if it's not very healthy, than tis not very healthy for recreation either

Jeff: What overall advantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee L: One control of the flooding—it does help us understand how the flooding will affect us. Within certain controls we know where the flooding is going to end up- it's a much safer environment that we can have people living in when they know how to plan when flooding does happen. The most productive land in all of Wairarapa so if we are not able to manage flooding there it would have a huge impact on the economy

Jeff: What disadvantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee L: Mainly environmental and around the health of the lake- the wetlands around the lake have been compromised

Jeff: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee L: Not a lot really- it was put in for a purpose- it's done that- its compromised the wetlands as a result

Jeff: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee L: More interest from higher up government- the majority of tourists don't come here. The big tourist spots draw all of the doc money- if we could have some government or DOC money to up its profile would make it easy to access money for other stuff. Without really serious money it's beyond the local budget to make a huge impact on the lake.

Jeff: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee L: No I don't think so- Council point of view- to be able to control the flooding we have a cost as well- so the urban payers are affected as well by the flooding. So no flooding control- no roads or there is a huge cost to the whole district. It is access and the cost of reinstating that access when it has been wiped out.

B. Interviewee M

Natalie: What is your occupation?

Interviewee M: I own a little lifestyle block, out in the country in 'teranekau' and I have some motels and a camping ground in Featherston, which I operate on a daily basis. So I'm also a South Wairarapa District Councilor of course.

Natalie: Where do you live (city and region)?

Interviewee M: I live just in between Featherston and Greytown, 11 acres of land. It's a rural location.

Natalie: How long have you lived in the Wairarapa region?

Interviewee M: Since 1963, so it's now 2016, so a long time, most of my life.

Natalie: Can you describe your role in the South Wairarapa District Council?

Interviewee M: I am a Featherston ward district councilor and I have a passion for our rivers, lakes waterways, and coastline. I was an honorary fisheries officer on the South Wairarapa Coast for 22 years and obviously I had a keen interest in anything that came out of our rivers ended up in the sea, so I have a passion for that ecosystem along that coastline and for that reason, I was appointed to the Wairarapa Moana Coordinating Committee, and also the Ruamahanga Whaitua committee.

Natalie: What do you value most about Wairarapa Moana? Why?

Interviewee M: Wairarapa Moana used to be a cesspool effectively, with the lower valley scheme and the diversion of the Ruamahanga River away from that natural flow. Over the years, of course, there's been a considerable amount of sediment built up there. The important thing is that we've recognized this now over the last 10-15 years perhaps. We're making improvements now, to make sure that the water that is in the lake of a quality that's acceptable to life and to humans. The wetlands side of it with the increase, obviously to the size of the wetlands which

acts a filter I think can achieve an outcome at the end of the day that is a reasonable water quality in Wairarapa Moana.

Natalie: What is the importance of Wairarapa Moana to the South Wairarapa District Council?

Interviewee M: It's a significant water body; in terms of council I guess it has no significance specifically for council, but for the communities, the farmers that live around the lake, it is a significant water body. From the recreational point of view, the council has obviously got plans to do something in that lake reserve area in terms of ascetics and in improving access, in improving availability of amenities down there as well. Our communities love it in terms of being able to go down and visit it, walk their dogs, occasionally paddle in it, and even windsurf in it from time to time. So I guess from a council perspective it has huge amenity value.

Natalie: How does Wairarapa Moana provide for the district's needs?

Interviewee M: It does provide 'Magni Kai' for Māori. Commercial fishing activity in terms of eel are prohibited from the area without special consent from Doc, and it does provide a sort of food source for some of our locals who go down there and put a new out and gather flounder. So it does have some community values along those lines.

Natalie: How do you view the water quality in Lake Wairarapa?

Interviewee M: The water quality over the years of course, for a period of time the water quality deteriorated quite significantly. Over the last period, and I'm probably talking about the last 10 years, the water quality hasn't really changed. We've seen more intensive dairy farming around the area, and there's been more opportunity in the area for it to become worse, greater polluted, but the reality is that it hasn't. It's been stable for the last 10 or so years. That I guess is a bit of an indictment on farming practices, which have improved over that period of time as well. So we're not seeing the flush off of phosphates, and nutrients loaded into that particular water body.

Natalie: What are the SWDC's views on fishing and maintaining native fish populations in Wairarapa Moana?

Interviewee M: I don't know if council actually has a view. Bu personally, once again it becomes a recreational amenity. There is a real importance that we got that quality fresh water,

where its going to allow those habitats to grow, they're available for our people to fish recreationally. There are some species, obviously within the Wairarapa that were introduced into New Zealand. They've had quite an impact on our native species as well. My personal view is that I'd like to see them culled out. Whether that will happen in my lifetime or not, I don't know.

Natalie: What do you know about flooding in Lake Wairarapa?

Interviewee M: Not as much as probably a lot of others, however I have lived in the area for a significant time now and seen some astronomical floods over the period, and I think our flooding is like any flood and it needs to be controlled, managed. We're a primary producing area so little bit of flooding can be quite detrimental to some of those primary producers within our regions.

Natalie: Do you think flooding is a major issue in the region?

Interviewee M: Certain times of the year, it certainly is yeah.

Natalie: Is flooding well managed?

Interviewee M: In my view it is. If I look back at my youth to see some of the land mass that was actually covered in floodwaters at specific times of the year. We don't see that any longer, so in my view it's being managed extremely well.

Natalie: What do you think of the current lake water levels?

Interviewee M: They fluctuate a little from time to time. I think once again they're managed to a large extent. From my observations and also the feedback from our community, it's that the levels during that fluctuation period are absolutely fine, work well for the area.

Natalie: Would you like to see it change?

Interviewee M: No

Natalie: What are your views on irrigation in the region?

Interviewee M: That's a bit of an open-ended question because irrigation actually comes from two sources, ones from ground water and one's from surface water. We need irrigation in this

area, we need proper water reticulation for irrigation; I think that needs to be managed probably on a larger scale than it currently is. I think the risk for us at the moment is if we're using groundwater, than that water is not interacting with surface water, and the same context it would do had we not been cycling it out of the ground. It's a difficult one to answer, irrigation is really important for our primary producers in this area. The scope for an increase in irrigate-able water is – yeah and I think we should be exploring more of those avenues.

Natalie: What is your opinion on the current status of the wetlands?

Interviewee M: I think the work that's being done down there is absolutely marvelous. This is the start of bigger things to come in the future, and it's not something you can do or reestablish over a short period of time. It'll take a generation to do some of the work and then it will take another generation to do more of the work, but as long as we keep plugging away at it, within our resources, we'll get a good result at the end of the day.

Natalie: Is there anything you would like to see change about how it's being managed?

Interviewee M: There are obviously, speaks the essence unfortunately, funding is always a problem. The only changes I would like to see are some time frames reduced so that we can actually do things a lot quicker. But the reality is that you have to work within a budget, you have to work within money's available providing we manage that, and we don't walk, we have a clear passage through.

Natalie: What is your opinion on the RAMSAR status?

Interviewee M: I have to say I'm a supporter of RAMSAR. I think it's a globally recognized position to be in and I think and think there's a golden opportunity for us to obviously get that status for a start, there are a few hurdles we have to jump, for a start. We have to meet 90% of the criteria for RAMSAR. I'm really supportive. I know this goes against the grain a little bit with some of our farming community, because they feel once the Wairarapa Moana area has Ramsar status, and they breach consent, the courts may view their breach a little bit harsher than they would do normally if it wasn't a RAMSAR status. We've tried to convince our farming community that that probably wouldn't be the case... I'm excited about it, I can't wait for this to happen, and I think it will give recognition to an area that is really significant in New Zealand.

Natalie: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee M: Other than through the Wairarapa Moana Coordinating committee, and the work that DOC are doing, we're not fully informed about the work that DoC are doing, I must admit, other than talking to DOC rangers themselves. I am aware of what we are doing through the Wairarapa Moana Coordinating committee.

Natalie: How important to you are conservation efforts regarding Lake Wairarapa? Why?

Interviewee M: They are important, significantly important. I think what we've seen over the last 100 years, is the degrading of some of our water body of massive size, so from my perspective. From an environmental perspective, that's important that we actually recognize that and that we move forward to improve that. It's not going to be done in five minutes it's going to take, once again, another couple of generations really to bring it up to what we, our communities would expect to be acceptable, but the pathway forward is there and if we don't deviate from it then...

Natalie: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee M: ... I think within water bodies, there should always be measures to prevent pollution. I have to say, our council have been really responsible, we've had our Featherston sewage treatment has been discharged into Donald's Creek, which ultimately discharges into Lake Wairarapa, for 100 years. That's about to change, we've bought some farm land, and obviously we're going to irrigate to land so I'm really excited about that and to me that's a pathway forward again, but that's going to take some time to achieve a good outcome there, so in the meantime we'll still have pollutants going into that water. I think we should always be ready to respond if there is an accidental discharge of some form of contamination, which is likely to affect the environment down there, and I know there's a pretty good team within greater wellington who do just that. ...

Natalie: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee M: ...My knowledge about it is very, very limited, I was around I guess when that scheme was being constructed, and there was some very good rational behind doing just that, it

certainly increased the flow of water escaping the Ruamahanga Catchment and it allowed for a lot of land to be reclaimed for pastoral farming... Probably that's about my limit of knowledge.

Natalie: What do you know about the Barrage Gates?

Interviewee M: The Barrage Gates, obviously they've been around since the 60's as well, and they formed part of that flood plan management area. I've seen them in operation. They do a very good job, at achieving a good outcome for raising and lowering levels of Lake Wairarapa. They're great little flushing systems, when the channel is being cleared at Lake Onoke, and a lot of water's let go I mean they assist in flushing that as well. My intimate knowledge of it is very, very limited, but that's my basic understanding of it. I think it's important that people in my profession have a general understanding of how the functions work...

Natalie: What do you know about the barrage gate resource consent renewal in 2019?

Interviewee M: Just the basic info from what I've been told, obviously through the Wairarapa Moana Coordinating Committee, and a field visit down to the gates, in the early stages of last year. We were told that the consent is coming up for renewal, and it's like anything its and arduous process. It has environmental implications. It needs to be- the I's need to be doted and the T's need to be crossed. But the telemetry, I think, there's been a continuation from Greater Wellington to modify the way they actually manage the gates. We get the report on that, so they're changing that telemetry so they can operate it on a more remote basis and also see what it's doing...

Natalie: Does the operation of the barrage gates have any impact on the activities of the SWDC?

Interviewee M: Not really, other than the fact that they're a mechanism for flushing to some extent, so yeah. Any buildup of lake Wairarapa in particular if the gates were closed for a long time then they could have more of an impact than if they were opened and flushed...

Natalie: What do you know about the Ruamahanga cutoff?

Interviewee M: ...Not a lot. I mean it's not something that registers high on the radar, simply because it is a stagnant bit of water, effectively between two channels, two bodies of water, but my knowledge is virtually zip on that.

Natalie: What do you think of the diversion of the Ruamahanga River?

Interviewee M: I think our fore fathers when they came up with the scheme they were really, really fore thinking, and thinking about how the lower Wairarapa would actually look as very rich primary producing area. So I think that they're thoughts at the time were absolutely wonderful, and the engineering at the time was wonderful as well. I have to say, that to some extent there was a sacrifice and the sacrifice was Lake Wairarapa, and whether that sacrifice was actually worth it? I think if we're environmentally conscious, as we are now a days, then it probably wasn't. But the reality is, that something needed to be done. And while I have the view I have, coming from farming stock, I loved the land, I love what the land's able to produce and I know that there have been some significant inroads into farming and farming practices around the area. So I guess, like you've asked the question today, I still support that diversion.

Natalie: Being a site for recreation, what is the appeal for maintaining the current conditions of the cut off?

Interviewee M: ... From a recreational point of view, it has some values. From any other reason it probably hasn't got a lot of values, I guess. It's a hard question actually, because if you intimately know the body of water then you'll look at what possibilities it's got. But I have to say I don't really know enough about it beyond that to answer the question.

Natalie: What overall advantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee M: The overall advantages really are to continue down that path of protecting primary producing areas within the Wairarapa... That's the advantage to me.

Natalie: What disadvantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee M: The disadvantages are of course that we've got a large, very large significant body of water, that's got very little in flow of water from another source, other than the 'teranekau' river. That's one of the disadvantages. If you look at it from a mapping point of view, that is a very large body of water and it's a damn shame that it is the way it is, because 'm

sure if we'd left the river flowing through it, it would probably be a much more appealing lake, then what it currently is.

Natalie: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee M: I've probably covered most of it actually, there's nothing I can specifically think of.

Natalie: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee M: Obviously, an increase in terms of Lake Wairarapa, certainly an increase in the wetlands area and more money put into that. I think it has real appeal, in terms of tourists, with its own unique ecosystems. Certainly in terms of bird life, it's very unique in terms of its bird life at the moment. I'd love to see that enhanced even more, and one of the reasons I say that is because tourism, to us, is a very important thing. If we can create an environment down there where we have tourists come into our area specifically to look at bird life or wetlands or aquatic species, then that's a real good outcome for this district.

Natalie: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee M: No, not really. There a lot of historically. Some of the ground water takes and surface water takes. Have to fence off areas of our water ways and right now, the management of the groundwater and surface water. Farmers are very smart now. Some herds of the cows are like 2000 through irrigation and techniques.

C. Interviewee N

Jena: what is your occupation?

Interviewee N: Farmer now, I've always been involved in the land. Engineering came about because I was a mechanic and then went off to engineering... I was always into [pastoral] farming so now I'm farming, and we farm 10,000 acres out the coast past the areas that you're looking at, but we look down on it. But it's quite interesting, long before the diversion was done a lot of the coastal runs, like we've got now, had land down there and either owned it or leased it. And they used to run all their [bullocks] down there until they got fat and it was a hell of a job to get them out, because there was no fences, they just – you put them in at the [puranori] and they could end up in Featherston... There was always been a bit of farming ... and I thoroughly enjoyed it with Horses and that, but it was quite dangerous... When you're young and bullet proof you don't think about it, but now I think about it the things we did down there.

Jena: Where do you live now?

Interviewee N: I live right out of Palliser Bay, out towards [Narwee], We have bout 4 ½ hectares, 5 hectares of beef, and that would go from the big hill way back and all our back countries. We border DOC land. A lot of it is reverting land and to be perfectly honest it should never have been cleared in the first place, and we are letting it revert for a lot of reasons. We get [Manuca] honey off it. That's a big money earner for us. We're also, because it was post 1998, we are actually carbon credits of it. Nowadays we're not selling them at the moment We're regenerating bush, sucks in all the carbon out of the atmosphere, so they, [NPI or MAF] have a scale on how much the- Carbon and that- they give us these carbon credits that we've built up, and we can't sell them... bit of a twist to that because if a fire goes through it, we're responsible for all the carbon credits that have been collected off that area. What we're doing because no insurance company really wants to... We're going to retain probably 10% of all the carbon credits we get and leave them in a secure carbon bank because if it does happen to catch fire, at least we got a buffer to pay the credits back. Also if the properties ever sold, and we've used all the carbon credits, we're actually buying a liability as well. It makes it more attractive... There are aspects on a lot of our paddocks, very good grazing. We're keeping them clear the best we can. But letting all the gullies that slip into the ocean and all the rest of it, keeping them in bush,

and it seems to be working. That's what we do, we farm sheep and beef, we have- we went through about 6,000 head of sheep, and about 400/600 head of cattle.

Jena: So as a farmer, are you affiliated with the SWDC at all?

Interviewee N: Yeah I'm a farmer, but I'm a counselor too. I've also got a share in a company in America, Somebody's got to start another company called point six, and they make socks for the active outdoor. We supply them a product.... Just picked up a contract with NATO, just buy them of all their socks.

Jena: How long have you lived in the region?

Interviewee N: 45 years, I've been down there. Before I moved out to Palliser Bay, I was inland, in the hill country but we looked down at all of the lake, that diversion. When it was started in the early 60's it was the biggest undertaking in the southern hemisphere and you've obviously got the figures on how much land was reclaimed, and I can't remember- it was quite a figure- the income off that land now is in the excess of 200 million dollars. It has made it a lot safer down there, for people going about. It hasn't really, I don't think it's deteriorated too much from the people wanting to enjoy it, it's actually probably made it better because of the narrows down there, this time of the year, there's just boats everywhere, people waterskiing and enjoying it. But before you couldn't have done it. It was just so...

Jena: Can you describe your roll on the South Wairarapa District Council?

Interviewee N: Well I am a counselor, and I'm involved, to a degree in everything, but that's because the council table, but I do take an interest more in the coastal rural area, because we are an agricultural district, and at the end of the day we have to look at maintaining our infrastructure, our roads and services out there. To be fair, all the other council is recognized the value of the rural agriculture sector, so they- I don't have to have a physical fight to get things done. They agree.

Jena: What would you say you value most about Wairarapa Moana?

Interviewee N: Well it's a natural wetland, and on the environment side, I would like to see it being maintained. There's been a lot of discussion at the pollution levels in the lake, some people

have said that they want to see it go back to the way it was when it was clear and blue, but it was never clear and blue. It was always a shallow lake, and it was always silt based. Every time you get a big wind and wave action, it stirs it up. But I guess as it is, as a manner I would like to see it protected, definitely. A lot of people don't agree with the Regional council, and their freshwater policies, but I do believe that we've got to make sure that we're not polluting it, by agriculture farming. Invariably it will be polluted to some degree. There are ways of mitigating it, and [Farmlero], our biggest dairy company, they have a standard too, and if people aren't meeting that standard then They might pick their milk up and go, because part of their sale, I guess, is to sell the image of the area, the country. And if we've got a bad polluted lake that is being caused by the dairy industry, people aren't going to enjoy that all that much. I would say 95% of the dairy farmers are really on board with it. They're building buffer zones- it's interesting this last year, have you heard about Whitebait? This past years was probably one of the best years for whitebait, purely and simply I believe, a lot of the water is a lot clear, a lot cleaner in terms of the amount of pollutants, so they're coming back up there and rebreeding. I guess in the [hay days] before that was ever drained, there was a lot more Whitebait because there was a lot more area for them. But you can't stop progress, you don't buy any more land, you can't make any more land. You got to do the best with what you got. Look back yes, but you can't step back.

Jena: What is the importance of Wairarapa Moana to the South Wairarapa District Council?

Interviewee N: There's actually a bit of joke, I think. Not many districts have a wetland that big, and it takes the sediment from the whole valley, it's got a lot of bird life I suppose, there's some introduced species there that are meant to be cleaned up but they are working on. It's a beautiful spot. You've driven around it no doubt. People go camping on it, because just the fact of looking at water helps you relax a bit I guess. I believe it's a jewel, definitely. South Wairarapa District Council is totally behind keeping it pristine, or the best they can. You learn from the South Wairarapa District Council, just going through the process of urban sewer system, and where in the past treated affluent was going into the river, that was heading down there. But now it's not going to be going into the river. We're hoping that our consents will come through in the next month or so. But it all stacks up that we're all treated, and then we'll irrigate it to land.

Jena: So how would you treat it?

Interviewee N: We treat it thought the normal system, and then a UV, or ultra violet system, and then that water is probably... , don't quote me on this, about 90% clear. But it's that other 10% that's still got pollutant in it. So what is done, it will go into an irrigation system where we will sprinkle it on the ground, the sunlight will break it down and kill it. Then by the time it does reach the water way it goes right through the ground, and 9t shouldn't be anything there. But I would say, and this is only opinion, but in the last 20 years, our rivers actually down here have got better, because we haven't got the little dairy factories that put all of their waste into these streams. We've been under the microscope a lot more in terms of our sewer systems, that there's going to be a standard before it can go into the rivers. I think the river quality has only been tested- we've only got data for the last 25 years, but in the last 10, 15 years, it's slightly improved if anything. What I'll think you'll find is the whole valley, starting from Masterton, start doing all this making sure the water's a lot cleaner when I goes into the receiving the water being the river.. It'll improve. But scientists tell me that a lot of it is still in the ground, and it's still leaching out slowly, all the pastures and the phosphates and that. I think we're a lot smarter in what we're doing, and a lot of it is to protect what we have here. It is beautiful... Naturally the lake area is going to flood up because the sediment comes down and of course that will be putting pressure on the system.

Jena: How does Wairarapa Moana provide for the district's needs?

Interviewee N: It's recreational mainly. The Wairarapa Moana as it is now doesn't have any economic value apart from recreation, maybe tourists. But the land that has been reclaimed has got huge returns.

Jena: How is the lake used for recreation?

Interviewee N: Well it used to have a very strong yachting club on it. But it has filled up, it doesn't – they hit the bottom of it. A lot of duck shooting, a lot of fishing. People go out there for flounder. A lot of people walk around the edge of it. There are a lot of people out there walking now that. There is a bike trail yeah. I guess to answer your question, yeah people like to use it for relaxation, and of course people on caravans who've been from the states, Germany, who're camping down there just love it. That's an attraction for the Wairarapa, these people are coming and buying a coffee and buying the stores. That puts money in people's bank accounts.

Jena: How do you view the water quality in Lake Wairarapa?

Interviewee N: As I said before, I think it's getting better. I don't know what the levels are at the moment, I haven't been down there for a while, and to be perfectly honest, I can't say I've ever drunk it. But I have gone swimming in it, and I fell off my horse in it one day. I think it's getting better.

Jena: Do you think they need to add more efforts for preserving water quality?

Interviewee N: Yeah definitely, I don't have the data in front of me how clean it is, but we can't expect to get it- I guess the question I keep asking myself is how clean it was before we started. We don't know that. I know a chap who said to me, a year ago he said, "you need to get that river back to probably as clean as it was when I was a kid, 15 years ago" I said "15 years ago, it's worse than what it is now" It's all dairy effluent that went straight into it.... We're not doing that anymore. So it's got to be cleaner.

Jena: What's your opinion on Ramsar status?

Interviewee N: I think it's probably a [brilliant] way to go. It's not going to put any more money in a bag- I doubt it will give us money to operate, but to internationally recognize that, and that again will probably bring tourists.

Jena: I heard that there are people who travel around to different Ramsar locations, so that's a good point. How do you view the water quality in Lake Wairarapa?

Interviewee N: What's going on through the Ducks unlimited, regional councils, Moana Wetland, a lot of private individuals are doing, putting in buffer zones, there's a lower valley scheme, can't remember- they're doing a lot of planting around lake Onoke. A lot of people go and work on the sand spit out there, all around western lake... I had to fly down there... There are areas that have good return of native bush around there that were clear before, because stock had total access to it. Now they're fencing it off, building a buffer zone and planting native trees...

Jena: How important to you are conservation efforts regarding Lake Wairarapa?

Interviewee N: Very important. Well we have to maintain the numbers... I was involved when we set up the New Zealand [Marina Company] that does all the work for [ice breaking] and the [ice breaker brand]. Part of their selling point is the imagery of New Zealand, clean and green. So yes it's very important. ... There are points that I do argue with, but overall yes.

Jena: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee N: Quite a bit. It is there to answer all the questions that you just asked me. That's also to work with the farmers, because some of the solutions are very hard to implement. You need the buyer from all of the farmers that are down there, for a lot of reasons, but more importantly they're down there all the time, they know the mood of the lake, they know the changes. Science might tell you that, it can give you an indication of what it does, but they're down there, they can see where the wave action is taking it back, and say to the regional council "we're going to lose the bank area. It protects us from the floods." I understand from a ... the people who farmed in the 60's there's not many of them left. They've seen huge erosions, in the lake, [from where they are]. It is being managed with the planting around there. It's more under control....

Jena: What do you know about the Barrage Gates?

Interviewee N: ...I know that they are there to control. They have done a good job. I know the ___ is that they've spent a lot of money on them. A lot of that money, I believe is being spent in the wrong direction. It's all to get consents. They were doing it for the right reasons. That consent money, a lot of it should go into the physical aspect of building up more... and that's what annoys me about the RMA. So our party, out there is making a lot of money ...and they're not directly involved on improving things. They get their lawyers and then they- first you put an application in, then you've done all the ground work with a planning company, paid a lot of money on it. They look at it, and then they say they want a peer review. So you have to basically do it again, and generally they come up [backfire] from each other. No they have to make some alterations. They can't agree all the time, otherwise... but that's costing a lot of money. That shouldn't be, because they know what they're doing. They know they're doing it to improve it. In case- They're looking at the possibility of a big Earth quake, and those gates jam. And it's like any infrastructure, it's like you owning a house, if you don't pay to keep it up to spec, you can

expect the worst outcome. All in all it matters that the gates did do the job. People are- fish and Game and all the rest are the fact that they shouldn't be there, but they're only interested in fish. The barrage gates... design and the fish are going up there.

Jena: What do you know about the barrage gate resource consent renewal in 2019?

Interviewee N: I don't know too much about that. I actually haven't seen it.

Austin: They actually haven't written it, or written an application for it yet.

Interviewee N: What you come up with will be part of it.

Jena: We're just relaying information to the Regional Council. Does the operation of the barrage gates have any impact on the activities of the SWDC?

Interviewee N: No

Jena: How could the barrage gates is operated in the future to suit the district's needs?

Interviewee N: Well I think at present they do, benefit the district's needs, particularly the rural... the do have fish passes and all the rest of it. I believe the biggest opponent to the renewal consent will be fish and Game. I can't see the Regional Council or DOC. They may want things treated... I mean because it's been there for such long time, It has proven its worth. They really shouldn't see too much opposition to it, because they're not changing it dramatically, they're just improving it. Any improvements go into it...

Jena: What do you think would be a reasonable compromise regarding the barrage gates?

Interviewee N: I wouldn't want to comment on that too much, because it doesn't affect me and my family, but I think that comment, that sort of question should be put towards the land owners, because they're the ones that are affected by it. And floods and dry years, in dry years they like to see the river level drop, because it does sort of backfill up with water, and keep the grass growing.

Jena: What do you know about the Ruamahanga cutoff?

Interviewee N: Quite a bit. It was put there for a purpose, to serve a purpose. It does it really well. That's probably, there are a few problems downstream of it, and it is silting up a bit. But I think, there's more river, water control in there, it's going to take more silt out, and then if it had it spread like that. It serves its purpose, yeah.

Jena: What do you think of the diversion of the Ruamahanga River?

Interviewee N: The whole scheme, I think is marvelous. I got a lot of friends who farm down there, and all their swamp lands really. They can only farm up to $\frac{3}{4}$ months of the year, max. There's now farming there 12 months of the year. So they've reclaimed all of that land. It came at a cost, they had to put a lot of- they paid for the scheme, through their rates.

Jena: Being a site for recreation, what is the appeal of maintaining the current conditions of the cutoff?

Interviewee N: The appeal is to keep that land productive. Stop flooding, of course. I think we've still got to keep the fisheries going. Bird life is going to be there anyway. It does create a bit of a habitat for birds. I'll go back to what I said before. The scheme, is well worth it.

Jena: What are the overall advantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee N: Pretty well answered all that already.

Jena: Ok, are there any disadvantages?

Interviewee N: I guess if you still wanted to run around with a grass skirt and a spear, and it was all swamp and mud, you'd be running around there and spearing a few flounder, whatever. I don't think that there is a disadvantage. There has slightly been a disadvantage for habitat for birds, whitebait, but they are starting to come back. There's a lot of management in that.

Jena: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee N: No.

Jena: Of these issues, that we discussed, which do you think should be addressed first?

Interviewee N: The environmental issues, definitely. I think the barrage gates improvement has to be done.

Jena: Barrage Gate improvement in which way?

Interviewee N: Well they are, I think the intentions are to improve the disadvantages with the consent. That's a must.

Jena: When you say improve, do you mean improve how they're operated?

Interviewee N: yeah, operation ... sort of future proofing the barrage gates.

Austin: Big Earthquake?

Jena: Technology improvements?

Interviewee N: yeah, and that [course] environment.

Jena: If there was one thing you would like to see going forward, regarding the management of the lake, what would it be?

Interviewee N: I'd like to see everyone singing from the same song. Because people disagree on the major issues really only to later- my experience on the council, you have people who protest about what they're doing in terms of infrastructure improvements and they come and complain. Really it just slows the whole process down...

Jena: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee N: I think we pretty well covered the likes of that. Had I been farming down there in my last 30 years, physically farming on my account, I'd probably be able to answer in detail a lot more of your questions. But, it's more of an owner's view.

D. Interviewee O, Interviewee P, and Interviewee Q

Jena: What is your occupation?

Interviewee O: I'm the group manager for planning and environment.

Interviewee P: And I'm a planner

Jena: Where do you live?

Interviewee O: Te Maeri Road, Martinborough. It's out of Martinborough a bit, about 7k.

Interviewee P: Wood street, Greytown.

Jena: How long have you lived in the Wairarapa region?

Interviewee O: 2 years and 5 months

Interviewee P: All my life, so 30 something years.

Jena: And in the same area or did you move around?

Interviewee P: I grew up north of Masterton.

Jena: Can you describe your role in the South Wairarapa District Council?

Interviewee O: I'm the group manager.

Jena: What are your responsibilities?

Interviewee O: Resource management, environmental health, alcohol bylaws, building act, strategic projects...

Interviewee P: I'm a planner. I look after the district plan related stuff, resource consents, ..., reports, talk to the public, that sort of stuff.

Interviewee O: And projects, when I give them to you

Jena: What do you value most about Wairarapa Moana? Why?

Interviewee P: I would do a bit of fishing around there; take the kids down there. What is the value of the actual lake? I guess it's just a large piece of kind of natural area, which is good to have around.

Jena: What is the importance of Wairarapa Moana to the South Wairarapa District Council?

Interviewee O: I don't think it's got a huge importance in the sense of economic or political outcomes, but it's an important thing in Wairarapa. It's a lake. Lake's in there what they come in New Zealand. Especially in the North Island, of any significance and the type of lake that it is provides a unique sort of ecological setting for this district. So I think the council values it from those sorts of perspectives, but I think it also - linkages of the lake to iwi and the cultural heritage that that involves, the council certainly recognize that.

Interviewee P: Tourist values-

Interviewee O: Tourist value is another thing that the council considers quite strongly actually, and of course he have a domain on the lake, a reserve that we operate anyways, so we're part of the lake management in that sense. So yeah, it plays a role for us, it's a community asset, in a broad sense.

Jena: How does Wairarapa Moana provide for the district's needs?

Interviewee O: Well it provides for recreational activities, which is one of the key factors. It's probably the main thing really, isn't it? It's not a strict economic resource in terms of fishing or anything like that. Eeling does take place in the lake. But that's managed by doc and iwi, so it's not this council's engagement. So tourism and that would be the main thing from our perspective. Ecological, Hmmm I don't know, I think tourism would be the main thing.

Jena: How is Wairarapa Moana used recreationally?

Interviewee O: Well the lake domain has a sailing club on it. So there's one recreational use. People go boating, fishing just general activities. People go water skiing on the lake, is that allowed? I don't even know if that's allowed

Jena: I think the lake itself might be too shallow, but they use the cut off.

Interviewee O: yeah, there'd be sticks and things in there.

Interviewee P: Duck shooting as well.

Interviewee O: and cycling pathways around the lake and by the lake.

Interviewee P: Walking your dog around the lake

Interviewee O: I don't know if you're aware but there's a cycle trail from Maymorn, over in the Hutt Valley, over to Featherston, along the old railway, the Fell railway track, and they've now connected that around the cape, and around Eastbourne on wellington harbor. So you can do a loop now, and a lot of that trip is by the lake basically so the council has been developing that, Mark who you'll talk to soon has been doing that, so he'll be able to tell you a little bit about that. I think they've set it up so you get lake views and all of that type of thing.

Jena: How do you view the water quality in Lake Wairarapa?

Interviewee O: Well I've seen the stats from the regional council. So the water quality at times can be quite good, and at other times be quite poor. Overall it's probably not in a natural state. So it could be improved, potentially.

Interviewee P: I think the perception is that it's very poor qualities because it's kind of muddy sort of a lake... because it's so shallow it often looks muddy.

Interviewee O: Murky. The turbidity is low.

Interviewee P: So even if the water quality was really good it would still get that appearance.

Interviewee O: but the water quality can be a bit marginal at times, mainly- our Featherston waste water treatment discharges into Donald creek, which discharges into the lake, so that affects nitrate and phosphorous levels in the lake. Biologically, I don't think the lake is in horrible condition but in terms of chemical nutrients, it's not so good....

Jena: What are the SWDC's views on fishing and maintaining native fish populations in Wairarapa Moana?

Interviewee O: I don't know, I can't speak for the council in that sense. I don't know you wouldn't either would you?

Interviewee P: Do you mean fishing for native fish or fishing for fish in general?

Jena: Protecting and maintaining native fish populations? Is monitoring the fish an important factor?

Interviewee O: I don't think it's really high on this council's agenda. Well obviously they're interested in it but it's not a function we undertake. That's a regional council function in New Zealand.

Jena: What do you know about flooding in Lake Wairarapa?

Interviewee O: Well I know what the scheme does and why it was set up.

Jena: Do you think flooding is a major issue in the region?

Interviewee O: ...Around the lake: Well there's been a lot of argument about the impact of the flood control scheme on the margins of the lake because the purpose of the scheme is to prevent that land flooding and to actually enable reclaiming of land at the margin of the lake for farming. If you were an advocate for a more natural ecosystem there you'd think that is bad. If you think the economic benefits are more important, then you'd think it was good. The council I think has a view, as it is now, the lake can operate, but I don't think the council would want more reclamation of the lake. But equally I don't think they'd want the loss of productive land to the lake. So the balance line is where it is in terms of the council's view, the regional council flood protection people have presented to our council the economic benefits of that scheme, which are substantial. Then that money flows into this area, and this is not a rich area. So it needs the money, so there's a tension between the ecology and the earning of money...

Jena: Is flooding well-managed?

Interviewee O: ...There's a system in place that has certain impacts on the environment, and certain benefits economically. The regional council certainly runs that system effectively,

because it does what it's meant to do, and that was keep land dry for farming. To that extent it's successful, no doubt about it. It's just whether you disagree with interfering in nature like that.

Interviewee P: Yeah I think it works, yeah.

Jena: What do you think of the current lake water levels?

Interviewee O: I think they're adequate, actually. Many would disagree but I think they're ok.

Interviewee P: I wouldn't know really.

Jena: What are your views on irrigation in the region?

Interviewee O: ...It's a big topic. This area, because of its climate, relies on irrigation. If you're going to have productive land use, you need it. So that's the tension again, you take water for that purpose and that leaves less water in natural systems, whether they'd be aquifers or surface water bodies. The price you pay for income and development. I'm a bit of a realist in that regard, you can't shut down the economy to put more water into systems. I mean there are environmental controls already in terms of minimum flows and [allocatable] volumes and all of those things that the regional council operates though. Assuming that they've got those numbers right. Then irrigation is fine. They haven't got a lot of those numbers right, but that's another story.

Jena: What is your opinion on the current status of the wetlands?

Interviewee O: Wetlands in this area, well the lake really is the only significant wetland area left, and it is slightly degraded, there's no doubt about it, its been impacted by human activity. It's not perfect, but whether it ever will be again, I don't know. I mean if you shut down the scheme and you let the natural systems operate again, then the lake would change, but so would all the other things that that scheme does. And that's what's debated through these resource consent application processes.

Jena: Do you know about the Ramsar status?

Interviewee O: Yeah, I disagree with it. But, the council supports it, so this council's formally said that they support Ramsar for the area. I don't, because I think it will provide unnecessary constraints on the use of the lake, ultimately including this bottom scheme that we're talking about.

Interviewee P: Yeah, a little bit. Yeah, from what I see it's more of a funding tool.

Interviewee O: Yeah, that's just the line that's used, to justify it. But the effect of it will be to influence regulatory decision making, and that's where I disagree.

Jena: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee O: Yes, the council's involved in the conservation effort, Russell sits on a working party that delivers projects relative to the lake, and I sit on a [office or a] governance group in relation to it. We're well aware of what's going on in general terms down there. Ian Gunn chairs your one there, doesn't he? And he attends the one I attend.

Interviewee P: There are a lot of pests and weed species in the lake. There are big imported resources to rectify that.

Jena: Could you talk about some of the projects that are going on?

Interviewee O: Well willow management, one of them.

Interviewee P: ...There's talk about looking into reducing some of the pest fish species.

Interviewee O: Because they're monitoring that all regularly aren't they, the presence of pests basically as a whole.

Interviewee P: And potentially how they could be utilized as a resource.

Jena: Do you think there is a need for any more anti-pollution or conservation measures to be taken? Please specify.

Interviewee O: Well those things are happening anyways. I mean the main sources of pollution for the lake are the inflows of the rivers and the streams, which are carrying nutrient runoff from

farms. So there's a whole farm management issue there, and that, in New Zealand as a whole, that's an issue, not just here. As a whole across New Zealand, that issue is being addressed. I think that in time will sort itself out.

Interviewee P: In terms of this council we chuck our sewer, semi treated [inflow] into the rivers and the streams, which will end up in the lake. This council is investing 30 odd million; mark will be able to give you more information if you want it, on taking our discharges out of the water, in other words discharging to land instead of to water, and the land discharges would be managed in a way where all of the nutrients and contaminants would be absorbed through plants and other things. That should have a positive effect ultimately on the quality in the lake because everything, all of the water systems in Wairarapa, go to the lake, basically, except on the coastal margin, which go to the ocean. Our discharges in this town, Greytown, and Featherston end up in the Ruamahanga River, which goes to the lake, and Featherston is Donald's Creek, which goes to the lake. The fact that we're investing heavily in land disposal and also in increased treatment before disposal should have a beneficial effect, but it will take time of course.

Jena: what brought about the changes in extra treatment and discharging to land?

Interviewee O: Well, we have to get resource consents too for those discharges from the regional council, just as the flood management people have to get a consent from their own council, from another part of their council for the barrage system and all that control. We have to do the same for our discharges. So the plans that the regional council has, and the new plan that they've generated require upgrading of the quality of the discharge. It's still discharge but the quality has to be significantly better than in the past. So it's a progressive change occurring through time to manage discharges to water, and in fact stop discharging to water. We're caught in the same environment as the flood control scheme. We're just renewing our resource consents with the regional council at the moment. Featherston hasn't been heard yet but Greytown and Martinborough have been heard by the hearings authority and decisions are due out soon on it, but we roughly know what they're going to be. Can still discharge, but the quality has to be significantly better. They are renewing our consent at the moment. Decisions are due out soon on it.

Interviewee P: I think everyone wants to reduce the wastewater that goes into the river. It's just the cost and the time factor as well.

Interviewee O: But other than that we're fine, It's wonderful, but being able to afford and having the time needed to implement it.... It takes a lot of effort, but it is happening and it's no different here than it is for other parts of New Zealand, it's the whole country slowly moving down that path.

Jena: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee O: Well we know it's a diversion system to stop water from entering the lake, and that maintains the lake at its current level, which prevents the lake flooding, which enables the farming activity. So in broad terms, that's what the system is, but in terms of the actual detail in how the operate it. Don't ask me. You're the same really-

Interviewee P: I don't know much more than that.

Jena: What do you know about the Barrage Gates?

Interviewee O:... I've seen them, that's all

Jena: Do you know about the barrage gate resource consent renewal in 2019?

Interviewee O: Yeah

Jena: Does the operation of the barrage gates have any impact on the activities of the SWDC?

Interviewee O: Well I don't know, but Mark again, when you talk to him you might ask whether it has any relation to flood levels and other areas and if the roads are affected. I don't know. It could. We have some pretty low lying roads.

Jena: What do you know about the Ruamahanga cutoff?

Interviewee O: ...I've seen it

Interviewee P: There are a lot of mosquitos in it.

Interviewee O: Wasn't Ian Gunn doing work around that though? Doing ecological work around that as part of the scheme, we're all involved in? I'm sure he drew diagrams for us at one meeting showing stuff that was happening, but no I don't know a lot.

Interviewee P: It's pretty stagnant, isn't it? And its upsetting, and there has been talk from some people of opening it up and flushing it out.

Interviewee O: That's what he was talking about and it had something to do with levels, stop banks and some farmer's property, I can't remember the details...

Jena: What are your thoughts on opening up or potentially having more flow through it?

Interviewee O: I don't know. If that is a decision that's made, it is made. It would have a benefit of moving the water.

Jena: What do you think of the diversion of the Ruamahanga River?

Interviewee O: Well I think it's necessary in order to maintain the land.

Jena: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee O: Well its part of the whole, you can't just look at the ecology of the thing. You got to look at all elements of it, which includes the economic gains and losses of doing certain things and the benefit of the scheme to our local economy here. The Regional Council presented to council and I think it's a net \$150 million over 5 years. It's a lot of money for this area, but I don't know if that's their latest statistic, but they spoke to the council about it and that's the sort of numbers they were turning around. So that's roughly \$30 million a year to our economy, for 10,000 people in this district that's a lot of money, it pays for the wastewater scheme.

Interviewee Q: If only it would... Have you ever seen the original maps from the district like a 100 odd years ago?

Interviewee O: yeah, I have actually, of the lake.

Interviewee Q: Because this was entire Lake District, there was like hundreds of lakes between here-

Interviewee O: -Well the lake would grow, because it would shut itself off from the ocean, and then it would grow and grow and grow, to the point where it got so much load hydraulically that it would blow itself out to the ocean again and then it would go back down and then it would build up again-

Interviewee Q: -and that's why it's so. I guess looking at- we were having some discussions with the water- Wairarapa water group, most people don't like this bit, if you look at anywhere where there's been major engineering work... in contradiction to the natural environmental process, and if you look at the levee systems they've put in Bangladesh, ...or the Mississippi system. The Mississippi at that point of time was the largest irrigated system and it just doesn't work, because over time, obviously the Mississippi system was obviously, as it silted up, they raised the heights of the levees, and they're at a point where the actual river is several meters above ground level, and the only option is now to continually raise the levees and when that does go, when you look at say for example, New Orleans issue, there they haven't put back the levees, so the areas that were devastated due to the flood [climate] and the breaching of those levees. They haven't actually rebuilt them and gone back to where they were because you can't, it's similar to- we've got coastal erosion issues, out the coast. Try to build an engineering structure in contravention of nature is never in perpetuity, you can't like- so what they've done with the gates, it's a great system, and it's a great way to try and avoid the impacts, further down, and stop the impacts higher up, but it is difficult to change nature.

Interviewee O: It has its cost, but that's what we do.

Interviewee Q: The dam systems east of the [Wairi] river where [the Ferry] road used to be if you go to a place called [chucka] there's a wharf there, which was the original wharf. And that would sit probably 20 meters higher than where the actual river levels now are.

Interviewee O: That's because they take all of that water for irrigation.

Interviewee Q: But that's caused major silting problems, its caused massive environmental problems.

Interviewee O: But I'll give you a different example. In Hawk's Bay, where I come from, there's a major river, the Nora River, it's bigger than the Ruamahanga, and they cut a diversion for it. And it protected huge amounts of land, and they built the levees and they've never had problems or a need to raise them and it's eventually prevented the flooding of [hevelock north] and [clyde] townships, and it's released all this land to the [locals] and it's benefited the area. But it has come with a cost. The ecology of that river is quite different now than what it was.

Interviewee Q:... The change in the ecology and the change in [how the] environmental systems work then changed the social structure or the economic structure of the community. And for example, my father went snowy mountain skiing many years ago and the snowy mountain river if you Google the outflow, which was one of the strongest greatest rivers in Australia, it now comes out into the ocean at a 300 ml colder. They diverted the entire river inland, instead of going to the ocean. They had a large amount of water, which was great so instead of growing photo type crops they just started to grow things like rice, which are a high yield crop. It gives a large economic benefit to the farmers, a large amount of water that they put onto the ground, and then caused salinity, and now so those areas are now no good for cropping or for anything because they've ruined the land forever. Not unlike the dust bowl with the cotton in America, you don't have to look back into history too far to find examples where one change leads to another change, which leads to another change and then you can't go back to square one, because you're too far down the track.

Interviewee O: And with the lake Wairarapa scenario, the water quality issue is about the lack of flow through the lake and I know that's what we've talked about as part of these consent renewals, can we introduce some water flow into the lake, and that would help the sedimentation problem, the contaminant levels, because the water would be moving, and various other things. So it's the same debate, and there's no right or wrong to it, but it's where you put your benefit, you take the economic and the productive benefits and do they outweigh the ecological things. So I don't see there's a right and a wrong in it per se, because whether the lake stays at where it is now, it is slightly degraded or not, isn't life threatening to the Wairarapa. That's the thing. You can transfer the cost to the lake and ignore it.... The natural process of that lake is to become land, and if you'd look at the natural geology and geography of it, that lake had been left over a very long period of time, the land would have reclaimed it, unless major geological forces such

as earthquakes had changed that process. It would have eventually silted up, become a literal wetland, rather than a lake, with wetlands at the edge, and it would have naturally reclaimed itself. That's what happens, so maintaining a lake, as a lake is actually intervening in nature too.

Interviewee Q: That's often when people look at pre- European intervention and see that as a point where-

Interviewee O: -everything is natural at that point, and it's not-

Interviewee Q: -At that point it's a biological system, which is evolving.

Interviewee O: And in New Zealand in particular, lakes, unless they're really deep lakes or in different circumstances to what this area has, they don't last forever because we have rapidly eroding landscape and that's where it ends up in those, that's the point of [deposition]. So a part of your study, if you want to look at New Zealand's erosion rates, you'll see they're some of the highest in the world. And that has influences on lakes like this, tremendously.

Interviewee Q: It still amazes me the size of the gravel that actually comes out of our river heads. How we, continually along the coast, keep digging out to keep the flows so the water actually gets through, underneath our bridges and like. That bridge out in [titimurray] there and that's classic, at the moments it is probably got about 2 ft, you can stand next to the bridge...

Russell and Murray Leave the Interview

Interviewee Q: So My understanding of most of it is from an operational perspective

Jena: How long have you lived in the Wairarapa region?

Interviewee Q: Six years in May

Jena: Where exactly do you live?

Interviewee Q: Carterton

Jena: Can you describe your role in the South Wairarapa District Council?

Interviewee Q: So under my authority comes everything from roads, waters, civil defense, wildfire, libraries and some social services. So any operational part of the council [sits for myself].

Jena: What do you value most about Wairarapa Moana? Why?

Interviewee Q: Just purely the environmental aspect that it is. It's an area that's- I wouldn't say it's pristine, because it's obviously got a lot of manmade encroachment. There's are parts of New Zealand you can go, completely as it was hundreds of years ago, but it's certainly accessible, which is probably one of the best parts of it, you've got not the best of everything, but you've got just about everything. From coasts, you got beaches, you've got lakes, you've got hills, for things like duck shooting, deer shooting, that outdoors aspect. The Wairarapa has just about every single piece of it, from white baiting, which is very big on the lake and that. It's not the greatest white baiting place in the world, and not the greatest duck shooting place and not the greatest deer-shooting place, but it has it all, which is I guess free to me. And having kids, and that environmental aspect, for kids be able to grow up, and be some of the environmental stuff to me if you're taking from nature, as in your blackberry picking, you're shooting you're hunting, if you're fishing. To me it's- you're reaping from nature, and it gives you a first-hand appreciation of what it's about. Obviously there are the strong environmentalists who think all hunting and shooting, that's bad. But I think, if you're a part of it, you have a closer bond to it.

Jena: What is the importance of Wairarapa Moana to the South Wairarapa District Council?

Interviewee Q: For of all, it's iconic, it's the lake and it's lake ferry and it's one of the- Its part of South Wairarapa's tourism portfolio. It's what we showcase as us. That's one of the most important parts from projecting ourselves externally. However, internally the economics of it is a major part. Obviously with the lake and its formation are being exceptionally flat and silted soils make very good soils for dairy, very good soils for agriculture, like any delta, if you can classify it as a delta. The environment is a major part of it. The economics is a major part of it. Lifestyle- I was at a meeting only recently, with several other Wellington councils, between the Hutt and Wellington and Porirua and that, where they mentioned Wairarapa as the playground of wellington. Because we have a significant border in the hills, you have a reasonably built up, urbanized area, to come over here it supplies Wellington with that environmental aspect, and

that's on a lot of levels. You've got people who bring their kids over here to go fishing, and do that sort of family type thing, you've got your- a couple days ago there was a whole party of young guys going up the road probably for a bucks night, someone's obviously getting married. So you have that sort of part, the wineries, and the boutique part. It caters to a lot of different groups.

Jena: How does Wairarapa Moana provide for the district's needs?

Interviewee Q: Obviously from the economics, if the area was less economic then our rate taken, what we'd be able to afford and other services away from there, things like libraries and all those, they're all funded- we take a small amount of rates taken from all our rural people. And that fund some of the urban services. And that gives them services that they can even now with these [civilization] service, we're talking about libraries, all have eBooks. So if you're anywhere in the district you can download a book. You can read an eBook. Those sorts of things are actually funded because of the economics of the region, and although it's not a direct link from say a library book to the Moana. The fact that that is there, that the draw for the tourism is there. The ability for farmers to be more productive is there. That allows us to [break our rates] and go across and that's good for everybody.

Jena: How is Wairarapa Moana used recreationally?

Interviewee Q: Across the board you've got obviously fishing, and the likes of that. You've got the – what's the term for visual tourism, where you just go and look at it- where people just see something. That's a major part itself. It's just used as somewhere to be. You've got your fishing, you've got your hunting, ... duck shooting, at areas around. Things like whitebaiting., which is all hunter gatherer type part, so it provides that. There's a very strong link between the- I'm trying to think of a nice word for hunter gatherer- being able to take food from the environment, is a very strong cultural part as well. Iwi are very much into the [aircon] that side of it. – It also has very good fishing, but those things fee into tourism as well as supply local benefit just to the people who live here.

Jena: How do you view the water quality in Lake Wairarapa?

Interviewee Q: That's a difficult one, I've seen media where it says that the Ruamahanga that feeds into it is one of the dirtiest rivers in New Zealand and it had some very bad press. I've seen some freshwater studies where it said it is not as bad as it's said to be. It would be difficult to comment I have no issue, like my kids all swim in the Ruamahanga... recently someone got hurt, jumping off a bridge, and all my kids bridge dive off of all of the bridges, it is just what locals do... New Zealand itself culturally has a lifestyle which is I guess outside, a third of its population is in Auckland, isn't it, but outside that center of urbanism. Even then you have people who live in Auckland and drive 4-wheel drive and think they're country. They may have never even been here, but they would know of us, they know what we do. Lots of people aspire to be that way inclined.

Jena: What are the SWDC's views on fishing and maintaining native fish populations in Wairarapa Moana?

Interviewee Q: Environmentally, obviously the native fish, and- My kids did some things on eels when they were here, the long-fin eel- I didn't even – I've learned stuff about things that I've eaten, I didn't even know what it did. But apparently the long fin eel goes all the way to [taunga], breeds and comes all the way back up here. Seems like a long way to get a breed, if you're an eel, yeah, that's what you do. Maintaining the native balance, I think is really, really important. I know I've heard [contest] regarding protecting it against from the likes of things like carp.... From an SWDC's perspective, maintaining the environment, ensuring that native species in the lake are protected and looked after, and I know they're quite susceptible to pneumonia, which through the likes of our over-fertilization of farms, wastewater systems and that, it's a major issue. Our council is one of the only councils in the whole country- when I first came here 6 years ago. They had a policy at that point in time to remove 100% of our sewage out of rivers. We're currently going through that process at the moment. We've bought a couple of farms. At most it is going to be a 30 year project. It's not something we can do straight away. If you don't start today, then it will be a 31 year project? They're being very cognizant. Our council is being exceptionally good in taking that stance. We've more so than any other council that I know of. We do know it's exceptionally difficult, the rates for it and the dollars to be able to do that. But our council is more than happy to spread that burden over a long period of time. I guess you have a small amount of local pain in having to pay for those sorts of systems but protecting the

environment, without that environment, we wouldn't be having some of the services that we have now. So it seems something we have to do.

Jena: What do you know about flooding in Lake Wairarapa?

Interviewee Q: I've been here when we've had various floods, I know basically how the system works, and the major concerns that come back to council on flooding are farm productivity. For example say in the [oxbow] when we close the barrage gates and when we... let the lake come up higher before we open it up. Our policy, the Regional Council's policy is to try and let it get as high as possible before we open the entrance. That way it creates a larger push and can clear a lot more out, has a better effect. But of course, the longer that water level is up, the topography around the lake is exceptionally flat, so if you'd raise it by a foot, it can actually be several hundred meters in, if not more. And then cows can't graze, obviously cows won't put their head into water to eat. We get a lot of issues coming to us about putting pressure on, there's a lot of pressure on the regional council about trying to keep the lake at as low of a level as possible, to get as much productive farmland as possible. But it's a balance. The [oxbow in the part] here is similar. Not a difficulty ... once we actually -Once the water breaks from here, goes through the [oxbow], floods a large amount of land, and heads across the [Ruakautra] floodway. Once the flood comes down, can often- we get a lot of ponding. That water can pond on farmland for quite some time. And once again, until the water table drops, the water can't actually get through to get out. That affects not just productivity, but it also affects farm management. Where if you're cycling your cows for certain paddocks, then certain paddocks would get slogged up, if you got a cow in there, and then you need to swap them to different paddocks. It makes the running farms a bit difficult, a bit more difficult where they're subject to flooding. Roadways are probably another issue. We've got a lot of roads that go under water all the time. Most of those roads are pretty robust. Over many, many years, we've built them with a lot of free draining gravels in the way. So the road goes under water, when it goes down, there's very little effect to the actual roadway itself. But that's just through a lot of historical management over many, many years. But road closures [is always been one of those parts], when certain roads close fairly regularly. For locals, it's not an issue. New people, who've never been here before, it becomes far more of an issue.

Jena: Do you think flooding is a major issue in the region?

Interviewee Q: I wouldn't say it's a major issue, it's an issue. It's no different, - different areas have different problems. I worked for Franklin council for a period of time [they're actually ... flooding land Major subsilience] is their biggest problem. When you had major cyclones and storms, you would get slips over roads. Roads would close and roads would fall away. It's a different issue for the same problem. Every council will have issues in regards to that management [fallouts] in some other areas. Different councils have different problems. And it is a problem to us but it's nothing insurmountable.

Jena: Is flooding well-managed?

Interviewee Q: There's a huge amount of resource put into it. If you look at the amount of people who work say in the GIS space in Greater Wellington, just around flood modeling. It's something that has a lot of resource put towards it. Once again, it's a balance between how much resource you put towards it, how much physical infrastructure you put towards it, to what the outcome is actually going to be. Levee banks and the like, you can always build more levees and bigger levees. But there's never a doubt that you can always do more, but it's striking the balance between how much work you do to how much benefit you get from it. I think we've got it about right. If anything we'd probably put a bit more because of the economics, probably put more effort towards them, I would say.

Jena: What do you think of the current lake water levels?

Interviewee Q: Fine, I think. I'm not an expert on it, but looking at the frequency of closure, looking at the frequency of opening the entrance up. I think it's managed quite well. I think where it is- it's been in operation for a while. So there hasn't been a major need to change, so I'd say it's about right.

Jena: What are your views on irrigation in the region?

Interviewee Q: Twofold: One, irrigation is great. If you irrigate from a land productivity perspective, and the way in which you do irrigate, you gain far great economic benefit from the asset to which you are using. This is going to be more of a personal review than my own council

view. So for me, I look at land irrigation, water, to me, is a resource like gold or coal, or anything else. New Zealand is pretty much one of the only countries in the world who does not view it that way. Water, because of the cultural values it has, it has always been given through Māori. Water is viewed like air, as a right, not as a resource. To me, it's the biggest fundamental difference in the way in which New Zealand deals with water, than any other country. If you look, we have one of the highest rainfall rates, but yet we don't harvest rain. We have very few dams, our hydro systems are, down south there is a few but we don't develop that anywhere near to what we could do. If you look at New Zealand, we're a very steep topography, a very long skinny island. All of the water that lands on our hills ends up in the ocean, in a very short period of time. With damming and with hydro systems and the like, you could harvest water, you could store water, and you could use it a lot better. But, that has a major environmental impact, in that you're playing with nature, which is not considered kosher. I think if you look at in Australia, where I was, If we built a roundabout, put a small roundabout in the road, we put tanks under the roundabout, we'd run all our road water, surface water, into those tanks. We would have a solar panel pump with a fountain and an irrigation system, which would water the flowers and the like all in that little roundabout. It is all highly decentralized, so little pieces all over the place. But it'd also be hooked into a water main, so only when there wasn't enough rainfall, and the underground tanks were empty, it would then use town water supply. The town water supply was always a second option system. I was just in a meeting, just before I came here, and we were talking about a similar- A friend of mine just came back from Bendigo. If you want a look at how a town uses water, Bendigo had a massive gold mine in the middle of the town. All the towns around there grew up. They grew up around the gold mine, so they got a huge hole in the center of town. What they've done is they run all the storm water, all the water into, from the entire town into that gold mine, turn it into a giant lake. They've run their sewage water in there and diluted it back, and then they run that as a secondary main around the entire town. The town has two water systems. They have potable water for drinking and they have what you would call industrial water or what's called straight class-3 water. And that's used for industrial water, firefighting, and all non-potable parts. If you look at us, the brilliant little meme you see on Facebook, there's a little African kid and he's got a bottle of water and underneath it, it's got written, it says- So let's get this right, you get water. You filter it, you chlorinate it, you treat it to world health standards, and then you flush your poo away with it, which is what we do. And if

you think about the amount of water that we process, to the standard we process it to, to how much it's actually used for drinking, and then everyone buys a bottle of water. To me, it seems a reasonably inefficient system. The first house I bought in Australia had 3 water systems in that house, which is not uncommon. You don't use drinking water, which is a valuable resource- You can actually, depending on how well.... but all our irrigation water, for outside the gardens and that, and for toilet was run raw water, channel water. We had a town water supply, water, which we use for showering and the rest. And or tank water went to several of the taps for drinking and cooking and all that didn't use good water for showering or for watering your garden.

Jena: What is your opinion on the current status of the wetlands?

Interviewee Q: I don't know. It's difficult because once again, you hear- I myself don't really have an opinion. I've heard stats to the negative, heard stats to the positive. Either way, I'm not really that – I couldn't really say, I don't use it as such.

Jena: Do you know about the Ramsar Status at all?

Interviewee Q: No

Jena: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee Q: There's a lot, they've got a lot of funding about 3 or 4 years ago, around a million bucks. There's been planting, there's been fence- I myself was part of some land _ We did a lot of stock fencing to try to keep stock out. We've done, we've tried to, at the top end of that, we've put some little paths in that through, and try to get more public use out of it. [Oterari there, I think is what it's called]. I know that there – on the environmental side, Doc opened up an extra duck-shooting season, which is about now, and we've got another because obviously they monitor waterfowl, which- One of the things across the country, they're actually cutting back, on a lot of water fowl takes. Where we are here we are actually getting increased. We've got a lot of water fowl. I believe Geese are quite a problem. But I don't know a lot about that, all I know is, that quite a few years ago, they changed the rules on geese to make them so they didn't count under the water fowl plan. So you could actually shoot them like rabbits, to try and cull them. They had a big cull recently, which in my department, we have a lot of – we've had issues with. They use helicopters and just shoot hundreds of them. But the difficult was that they

couldn't retrieve obviously all of the dead birds, so some wound up on the beach and people get very upset. All it takes is one wounded swan or one- and everyone gets very upset. I do understand why you'd get upset. But you've also got to understand that, some of the water fowl are like rabbits or possums, or anything else. They're just.... or more externally outside of New Zealand. But basically, these things are pests. That's basically all I really know. From a farmer's perspective, there's quite a few farmers as part of their whole farm plans, where they've actually got, riparian rights down to the- they're actually doing work themselves as part of their farm plans. And there was a farmer said here somewhere recently at one of the [air] shows, they won a big award for all their plant- for all their streams that lead to the lake, they've fenced them all and planted them all, a lot of them. That was on [country cow] on one of those ones. They had done very well. I think individually some farmers are taking more ownership on that.

Jena: Do you think there is a need for anti-pollution measures to be taken? Please specify.

Interviewee Q: ...I don't know how polluted it is. And that would sort of depict what you would need to do, if you had a benchmark standard you were trying to achieve, wouldn't it? I don't know the numbers very well, I couldn't recall them.

Jena: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee Q: I know how the Barrage Gates work. I sort of know how the lake, when they open it and what they do. I know how the top-end works and how it floods through. From an operational perspective I have an understanding of how it works.

Jena: What advantages are there with the current Lower Wairarapa Valley Development Scheme?

Interviewee Q: The biggest part is being able to use the lake as a buffer, so that you prevent flooding further down, and [when] you divert water back in and all you're doing is lengthening the period of time water gets from one point to another point, which then obviously reduces the impact in flooding at the other point. I think it's a good system. It seems to work. I don't know what it was like beforehand. I think as a system, and way it was put together. It does its job.

Jena: Are there any disadvantages?

Interviewee Q: I think the argument is always around levels, and what- I guess from more of a farmer's perspective, obviously the lower the levels, the longer periods of time, the more land they've got to access and the like. I think that's an issue. It's been brought up a lot in the media. Around the affect that dairy has on rivers with runoff and that. I think that may be being a bit overstated. And the reason I say that, is when I was younger, Farmers were farmers and they farmed and that was what they did. Phosphate was reasonably cheap and you just poured it on as much as you could, and that's what they did. The economics for phosphate globally as we're heading towards peak phosphorous, which will affect world, a lot greater than [pecore] ever will. Farmers are far more prudent in their management of their farms. I think even the use of things like the use of [definitely] irrigation, which our sewer systems, we're looking at doing. [Deficit] irrigation, where you only put enough liquid onto plants, so that the plant utilizes and it won't actually go down the river. Those sort of farm practices, the fact that most farm managers now have masters in [ag] science. Farming isn't what it used to be. I think over fertilizing, and letting land degrade, defeat the purpose of good business. And better business is actually having a better environmental effect because the least amount of fertilizer you can put on the maximized amount of benefit gives the best-cost benefit ratio.

Jena: What do you know about the barrage gate resource consent renewal in 2019?

Interviewee Q: I know it's being renewed, beyond that I don't know a lot about it. It's a Greater Wellington issue, obviously....

Jena: Does the operation of the barrage gates have any impact on the activities of the SWDC?

Interviewee Q: No, not particularly, only obviously in helping mitigate some of the flooding... We have issues with erosion, that we've put some sort of parklands right next to the lakes. Obviously, when the lake is higher and then with a bit of wind chop, that causes the erosion round park [furniture] and all that, which that is just natural. I think if the barrage gates weren't there it could possibly be a lot worse. Without looking, I couldn't really tell, the impacts aren't major.

Jena: What do you think would be a reasonable compromise regarding the barrage gates?

Interviewee Q: ...I think not having it there, reverts you back to being, having less control, and less control just means a greater impact in weather events. Obviously that has an unpredictable greater effect. Which, I would say would be negative. I think pushing the water, back into the lake, raising the lake levels- more frequently- I don't really know what the positive behind that would be. It's only really used in an event, and when there's an event, there are other purposes for it being used.... I can't see any other reasoning behind it really. If you let the water go through longer and then filled lake Onoke up more, before you let, before you started pushing the water into lake Wairarapa, if that then opened the gates under its own natural-sy The problem is, then you don't really drain the lakes, that well. So you'd end up with more siltation and greater problems, I would think. I can't really see anything out compromise with.

Jena: What do you know about the Ruamahanga cutoff?

Interviewee Q: ...I don't know much about that to be honest.

Jena: Are there any other issues regarding the Lower Wairarapa Valley Development Scheme that you think are important? Please elaborate.

Interviewee Q: Accessibility is probably the biggest issue for us. And you're probably looking at the scheme as in the lake and below, where we are here we have a place called [Oxboro] where we have a bridge that comes into town. So once the levels get up to a certain height on the bridge, then we have to close the bridge because the bridge becomes unsafe, and the water comes through a [sloosway] and then goes down through A man made lower drain. Oxbow, so it heads out around here and then it goes through to [Kautara], crosses the road, we've got some gates there, which we drop and it flows through there, it goes directly into the lake, at the top end of the lake. So what you're doing is you're taking water out of the Ruamahanga here and dropping it into the lake at the top end, rather than going down to where the barrage gates are and out to the lake, and out to Onoke and then the river- the ocean. Or if they close the gates so they run it back into Onoke, and back down. So the issue with that is purely, if the bridge and if they had major culverts through that section, you do the whole thing and not actually isolate properties. So, the difficulty that we have here is the water system that comes in behind us. If that floods, it closes the bridges behind the town and if simultaneously the Ruamahanga floods and closes the bridges into town, which then isolates the entire town, without having to go a very

long way to get around and get back out. Over the barrage gates is the only way back out, basically. So if you wanted to go to Masterton for example, you'd have to drive out over the gates and then you go back, so it's a long- Accessibility is probably the biggest issue, and we have a large amount of festivals and events, big things here. If the town was more isolated then the big event, it would just cause disruption to it. It's not a life or death situation, it's just a major inconvenience to a lot of people. So Accessibility would be the biggest issue from a flooding perspective.

Jena: Do both bridges block?

It All depends on what the rainfalls like, if you get a lot of rainfall, on top of the [waihini] it can come into the Ruamahanga, and push the Ruamahanga up, so the Ruamahanga can be low in Masterton and high down here. If we get a large amount of rain over that way, that can come into the Ruamahanga plus you've got [pa tahe] road, so if the water comes that way and blocks it back. it has happened since I've been here, but not for long periods of time....

Jena: So would you say Accessibility should be the first thing to be addressed?

Interviewee Q: Accessibility is from a safety perspective, and safety has to be number one, I guess, it's probably the biggest issue, beyond that, once Accessibility is affected, and it gets larger than that, then it starts affecting houses, and people and that sort of things, but Accessibility would be the first.

Jena: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee Q: Not in particular, like I said before in my personal ramble, engineering controls over environmental is always delicate. Damming, flooding, diverting, it's always difficult to know what the long-term aspects are. But I think this scheme's been in place long enough that the changes and the effects would be well know. And now, I could see if there was angst in building a scheme like this, and how it might run and what the effects might be. But reconsidering something that's been here and has a really good purpose, and has been run for a fair while, I don't really see much of an issue with it. But I think if you were going to build this

whole thing brand new, from scratch, there would be some wailing and gnashing of teeth from a lot of different parties.

E.4 Landowners

A. Interviewee R and Interviewee S

Austin: How long have you lived in the Wairarapa Region?

Interviewee R: All our lives, but I went away briefly for about two or three years, but otherwise we've both been here all the time.

Austin: Can you describe your farming activities?

Interviewee S: I've been a dairy farmer. We've owned our own dairy farm from 1980 until last year, 2015.

Interviewee R: Prior to that Noel did five years shear mocking- or I should say, we did five years of shear mocking- and before that he did three years of dairy farming.

Interviewee S: I actually trained as an engineer, but basically we've been dairying farming from 1975. And I was brought up on a farm so basically I was brought up on a dairy farm and Ann was brought up on a sheep farm.

Austin: Are you involved in any organizations?

Interviewee S: I passed up from Federated Farmers

Interviewee R: And you've [Noel] been involved with the running of federated farmers for a portion of time. He was dairy section chairmen for several years.

Interviewee S: But we are pretty much non-political now. We are members of a political party, but not active.

Austin: How do you value Wairarapa Moana?

Interviewee S: I think it's an asset for everybody to use

Austin: Use in what sense?

Interviewee S: Recreational and water storage

Interviewee R: Water storage in this day and age would probably have to be the main asset in the sense that it's a natural one, without having to make another one, but I think that it's an asset for the fact that it's the third largest wetlands in new Zealand or of my understanding is and to maintain it as that. Now, when I say maintain it as that, one of the biggest issues that we've had more recently is the fact of the Canadian geese issue, and that we DON'T approve of in the sense that Canadian geese are bad for farming. They may be nice to some people but to us they're bad for farming. So that is an issue when you talk about things that are "nice."

Interviewee S: Because we've only been involved in the last 40 years, just part of that, the fact that it's been made into a flood protection scheme is why we were able to farm there for forty years. We probably wouldn't have been able to farm like we did so we were the benefit of that flood scheme. So that's the main asset. It put some measure of control on the floods.

Interviewee R: Because, you know, Wairarapa Moana is a flood plain and was prone to VERY large flooding issues and that [LWVDS] has definitely helped control that.

Interviewee S: We weren't flooding on reclaimed land from the scheme or anything like that. It enabled the security of our land that we didn't have big floods.

Interviewee R: We do know that one of the major floods that did occur prior to that happening did actually flood what was their now property and we've not had that issue since.

Interviewee S: In our lives we have benefitted from their work.

Interviewee R: Our farm wouldn't have been a secure proposition had that not happened

Interviewee S: We moan all the time because our land was rated at a high rate and we are still paying for it now, but in the bigger picture of things it's probably quite small

Austin: How does the water system provide for your needs specifically?

Interviewee S: It gives us a measure of control over floods, so that's the first thing and in recent years we've used it as a source for irrigation, and recreation of fish and wildlife and that sort of thing.

Austin: Can you explain the quality of the soil in the region?

Interviewee S: We're what they call silt loam and it's of very high quality because it was all lake bed 400 or for 100 years so that's basically bloody good soil. It has got characteristics that are quite difficult to farm in the sense that it is a very fine particle, it's easy to damage when it gets too water logged, but basically it is very fertile

Austin: So I am guessing that the moist land would be hard for the cattle.

Interviewee S: It is of the characteristic that if you put cattle on it when it's wet you bugger it up and you damage the soil and you need to treat it with respect, but it is fertile. Other areas of the Wairarapa, you would scratch a hole with a tracker or a wheelie on a motor bike that wouldn't grow anything for 12 months, but down there it's good enough that'll grow again because it's fertile.

Austin: Do you think flooding is a major issue in the region?

Interviewee S: Yup.

Austin: Does it affect you currently?

Interviewee S: It doesn't affect us because of the human intervention, the system that's in place. It would affect us if it was uncontrolled.

Austin: Do you think the flooding has been well-managed by the greater wellington regional council? Do you agree with the management and the operation of it?

Interviewee S: We have grizzles at times, but overall the answer is yes and it's usually because we are looking at it from our point of view not from the whole point of view. So, you know, it's always easy to manage something if you've got one view but if you've got ten views it becomes harder and I'm sure they have to deal with ten views.

Interviewee R: There are issues at certain times of the year simple because the lake is meant to be maintained at a certain level within a bit and because the council does have to maintain the barrage gates and the scheme every so many years they actually let all the water out and paint the gates and that for us is a very big issue because we have water rights which disappear because they've chosen to paint the barrage gates. It makes us wonder why you have all the policies in place to look after birds and their wading area, etcetera and then you let all the water out. It doesn't quite all jell together. Now, in saying that I understand that you do have to maintain the equipment so it's a catch one situation. It's not good for us because we can't irrigate and we've got the right to, and for the birdlife I assume, what happens to them on the year they decide to do that? You're trying to protect, so there are issues that I have trouble with my on that.

Interviewee S: And that's sort of problem in saying that because we relied on the level of lake to get the water where we wanted to suck out of and realistically we could have sucked out of the water with a different system, that we didn't have a different system and that's why it was upsetting to us but not actually the bigger picture.

Austin: What do you think of the current lake target water levels?

Interviewee S: I think they are fairly right, actually. No comment one way or another, really.

Austin: So the only issue is when they are painting?

Interviewee R: They have a time frame that they say that they are going to do it in but invariably the weather is wrong, or something and it goes longer than the specified time. I believe there was probably and I would – I would need clarification- I believe there was a time in the planning stage of making the system work that there was going to be some allowance for another channel beside the barrage gates for, I don't know if it was for overflow or for when they were doing this sort of work or what, but it never got completed. There was part of the scheme at the barrage gates that was never completed. Now whether that would help any of that I don't know. I didn't study it well enough to know that.

Interviewee S: We've focus for our views from the farming aspect of it and worrying about mechanical things, not looking at the bigger picture or the ecological aspect of it. However, I think it's probably maintained some of the wetlands better by having stable lake levels.

Austin: I know that the painting of the gates was in issue in the 1999 Resource Consent as well.

Interviewee S: I'm sure they got every excuse why it was like that, it was just a pain for us.

Interviewee R: But my argument at the time was, well, if you got all these stringent things in place for the birdlife and protecting the wetlands, it was a nonsense in that respect, as well because suddenly it didn't seem to matter or something.

Interviewee S: But they've imposed a human thing on a natural thing, you're always going to have problems with human things. Your car should go forever, but it doesn't. It breaks down on you.

Interviewee R: I mean there's people that say that the fish life isn't working because of the barrage gates and that, but we've seen the fish there and we've seen all the shags, the birds there too and the fish hole. I think the fish still do move around, but that's just observing while we're farming, you know, I don't know that for a fact.

Austin: How are the fish important?

Interviewee R: Well I think that whitebait are important to have their breeding ground and the more we protect the edge of the lake the more they will be able to do their thing. We pretty much fenced off all of our part when we first moved there- the lake edge part- and I understand that a stream that isn't polluted or damaged or whatever makes for good breeding ground for whitebait and I mean we know we've had lots of eels in our drains, and we know we can catch a flounder from our property if we wanted to. It's just the sort of thing that when you live there you don't always do it. But in saying that we've had a jet more recently that was very into fishing and that and he enjoyed being there because of it and that was something he valued in our job. What might not have been such a good job for him was of true value because he could do that. And so he thought we were a lovely place because he could do all his fishing. Yeah, we think it's important that the fish are still there, yes.

Austin: How do you feel about the native fish in comparison to the exotic fish?

Interviewee S: I don't have a strong opinion one way or another. I REALLY don't like those tench, the ones that dig in the bank and scuff the banks up. They are an imported fish that get into our waterway.

Interviewee R: We became really confused. Often we would drive to town or somewhere and we would be going passed the cutoff and we would see all these people sitting there with their umbrellas- it could be a raining day- and they would all be sitting there with their little line and their hats on and their umbrellas and they'd be sitting there fishing and we couldn't figure these people out.

Interviewee S: It's very English. There's a whole school called broad fishing or something and they fish all day, catch these little fish, put them in the bucket, then chuck them back in the water at the end of the day.

Interviewee R: We basically take exception to that because we understand that these fish do do damage to our banks and actually erode under the waterline.

Interviewee S: They look like an overgrown goldfish. That's what they look like. I don't have any problems with trout.

Interviewee R: We don't, however, we were offered to have carp in our drains to keep it clean. Because our particular drain on our property was considered a "pump" drain and we pump out in the winter and let water come back into it in the summer for, up until now, irrigation purposes. I mean you can put screens and grills and all sort, but I think that probably one of the reasons why we didn't really consider it was the talk that, you know, if they got out into the main waterways it wasn't a good thing, but maybe it is the better way because, I mean, you know, the new proposals are that we can't clean our drains the way we once did and that we find hard to understand, too.

Interviewee S: Up and coming farmers may have a completely different view than us.

Interviewee R: I think you do need the young people that are going to be doing the farming from now on.

Austin: You said they don't let you clean the drains like you used to?

Interviewee R: They submissions we put in against that- there is a proposal being put forth by-

Interviewee S: I'm going to say concerned people to protect the fish life and fauna.

Interviewee R: Any farmer or contractor is not allowed to clean a drain as in you've got a drain, and you can't get a digger and go "clean" (motions with hand- one fluid motion). They are saying in the proposal that you clean one side and then you go back at a later time and clean the other side, which to a farmer or a contractor is ridiculous.

Interviewee S: It's just taking us a little bit of time to get our heads around that. It hasn't happened but that's what's sort of in the proposal. Whether they just did that to scare you so that you come up with a better idea, but it is just so that you leave some habitat untouched while you clean the drain. I think that's the guts of it.

Interviewee R: Part of me can understand why they say it after me saying about the habitat for the whitebait but this is a drain within a property. I perceive that if you are protecting all the lake edges and the start of drain mouths and stuff, you're actually doing that in a big way. I know that fish go up drains. I'm not talking about every drain, I'm talking about this particular pump drain because it can't be blocked up, you can't have weeds that block it from working because it blocks you're pump. A natural drain that comes out of those hills and just flows into the lake, that's a different story.

Interviewee S: I believe we have to educate ourselves and educate other people what you're talking about so you don't get that restriction or the unpractical restriction. I really think it's a big education thing, and as farmers we have to take some responsibility for that because it seems a nonsense to us to clean the drains. It was a manmade drain to drain the land and therefore that the purpose of the drain.

Interviewee R: It wasn't a natural drain to begin with. We have issues ourselves too with all that talk about that we've got to protect drains and stop animals from walking through and all that and we do understand that, but people who don't understand go up the main road to Masterton and they see the water courses that were built specifically to feed water to animals and there might be an animal standing in it. Now, one animal, maybe one or two animals standing in it. It's not going to affect those animals that are further away drinking from it. That's what it's there

for- for them to drink from, but people that have a “green” idea or nice ideas will drive up the road and they’ll see one animal standing there and they don’t understand that that was put there for the animal. There is a lot of room, I think, for education on what is a drain, what is a manmade one and natural one, what is manmade for animals to drink from, all those things.

Interviewee S: I think we are getting off the subject a bit, but basically politically the issues are going to come from you’ve got the people that are farming the land and making the food for the world, a small group, and the people that are having the bigger say in the cities that don’t always realize what is required to actually do what you have to do to get the food and I think that’s not going to go away. That’s going to be an issue right through your lives.

Austin: How do different bird species impact the region?

Interviewee R: Well, I think you heard my opinion of the Canadian geese. We do have a big issue down at the property with black swans.

Interviewee S: They compete for our grass at times so they foul the ground and eat the grass. We are probably pretty fortunate that the flight patterns and how things work we didn’t, we didn’t have a huge issue with it. It can be an issue.

Interviewee R: It can be a very big issue.

Interviewee S: You can end up with no grass in the morning because thousands of swans will come in the night and eat and foul the grass so the stock doesn’t want to eat so there is definitely competition with black swans.

Interviewee R: They look very pretty out on the lake.

Interviewee S: We don’t have any issue with ducks, they seem to be an asset rather than a...

Interviewee R: As a slight example, the chap we had working for us he would go and sit in the paddock and scare the swans when they were trying to come in with a gun, not always shoot them, sometimes he did in the right part of the season, but otherwise he would scare them because he didn’t like the fact that they were basically eating his income. He was milking the cows and if they were eating the grass, it was affecting what he got.

Interviewee S: Affectively, all he was doing was chasing them so they go and eat somebody else's grass.

Interviewee R: As an example, and you think oh god, he's not very nice. As an example there was one white swan trying to nest down near the barrage gates and he was very into where all the birds were. If you wanted to know where the birds were he knew where they were all nesting or had little babies or whatever and he knew this white swan was nesting near the barrage gates and there was a flood. He waded out in the water to try and rescue these eggs because he knew they were going to float away and he did get them, but didn't manage to incubate them. He tried. So while he might try and shoot birds, he also liked protecting them. We had a kotuku? (White heron) sitting around locally for a while. I haven't seen him recently, but that was a really special thing to have in our area.

Interviewee S: And we've had a bittern. There aren't many of those around. They just sit there with one leg, it's amazing.

Interviewee R: People criticize that 1080 has affected birdlife. In the time that we've lived at that property we've seen more birds every year so maybe we planted more trees so they came, don't know, but we had more birds. Generally before we left, there were even wood pigeons coming. So to us there was something good happening that was bringing more birds into the area. I don't know, it might have been more protection of the lake, don't know.

Austin: Do you know anything about the Ramsar status

Interviewee R: I've seen it mentioned somewhere but don't actually know about it.

Austin: What is the state of the water quality like in Lake Wairarapa?

Interviewee S: Pretty bad, because it's a shallow lake it's got a very muddy bottom, you're always going to have issues with it.

Austin: Do you think farming has had an effect on water quality?

Interviewee S: Well, I guess you've got to say that. I haven't seen an affect from it. I'm going to leave it as that. I haven't seen a direct affect from it. I know that industrial and farming must

have had some effect on it. I think it depends on how much it gets replenished and depends on how much rain we have.

Austin: Do you think farming practices need to be more conscious? Or do you think the farming affect is negligible?

Interviewee S: The farming has an affect but I believe we are managing it. There's enough going on. We are making changes. I take the view that you can't do nothing, there's always an effect if you do something, but I'm also saying that what we are doing is still important enough that we need to manage the effect. If that makes sense. I'm not trying to apologize for being a farmer. I've been a farmer and I believe we still need farmers.

Jena: Ann, would you like to add anything about water quality and the effects of farming on water quality?

Interviewee R: You probably shouldn't be asking me. I have big issues with people blaming farmers for every bit of water quality that's not right. I don't doubt that we've got issues that were are sorting and we are, but I do take issue when I see the councils taking another 20 years to sort there issues of what's going in the rivers and then it seems that it's only the farmers that get the blame.

Interviewee S: It's not the regional councils she's talking about, it's the local councils.

Interviewee R: But water quality is definitely an issue. I mean we obviously need to be aware of it and look after it. To me it's more than just farmers that are creating the problems, but other than that I believe that the farmers are taking it aboard and are doing a lot about it. Our dairy company has really been quite sever in making sure that when they come and look at our property that we are doing all the right things. How much more can be done than encourage us to do that and I believe we are. For the most part we are. Noel and I took great exception one day early in the piece when it was being mooted that we had to fence everything and we had use of the bank of the river down there that we paid a fee to the council to be able to use the stop bank to graze animals. Our animals went there about once a month for a day, a day, and I'm not telling fibs, that a fact, and a man happen to go down there one day and saw our animals there. He actually took pictures and put it in the newspaper and put sort of a bad thing about these farmers

who leave the animals for long periods of time by the water's edge or at the water's edge and it was just so untrue. He just hadn't appreciated that it was only one day and say once a month. We have since done more to protect the bank, but people are very unfair.

Interviewee S: The public hates dairy farmers.

Interviewee R: That's what we feel.

Interviewee S: I'm not making an excuse for being a dairy farmer because I think we still need dairy farmers.

Interviewee R: Enough said on that.

Interviewee S: It does get discussed in the house

Interviewee R: Quite often. Every time I hear it on the news.

Austin: What are your views on irrigation?

Interviewee S: I am pro-irrigation. I believe that so much water goes out to sea that we should just use a bit of it.

Interviewee R: I think that there probably more needed to- well its being done- but it needs as much done to study what is happening with the aquifers but I believe what is wasted in the winter and if it were stored they might assist in not actually perhaps draining some of the aquifers because I don't think there is still enough study even though they are doing it as to what we are doing under here. But I do think irrigation has got its place for sure. I mean, it's not just for dairy farmers, it's for all farming things. I mean there should be more water storage for the towns even and people being able to look after their sections without being limited and I'm talking about water that is there that we aren't using.

Interviewee S: I think we need to learn as we go but I would be disappointed if New Zealand couldn't feed itself because we didn't have enough water.

Interviewee R: Because we have got enough water, essentially.

Austin: How important is the lake, the cut off, and the river for recreational activities?

Interviewee R: Because it's a very shallow lake it's not really suited to water activities. The river has obviously been used like that and very popular but a lot of us believe that the water that they use for recreation is getting shallower there too which the council will tell us we're not right, but living by it and observing it we believe it has got more shallow.

Interviewee S: That's Ann's pick thing. That her pick.

Interviewee R: And for the amount of people we have seen using that for recreation with boating and canoes. The Petone people were storing them at our place for a time so they didn't have to carry them over the hill all the time and they practice on the river there. I think it's definitely got its recreation, I mean for fishing, yesterday I was down- no the day before- and there were people fishing off the barrage gates. So there a lot of people who use it just for recreational fishing and has definitely got a place in that sense.

Interviewee S: But I mean the lake creates a lot of, because it is a big lake and a nice drive around it so people use it as a recreational, just because it's there.

Interviewee R: We've noticed living up here how many more people are using the lake reserve camping site because of course we look down on it and we can see how many camper vans or something are sitting there at night, which is a very windy site but on days like this it's beautiful.

Interviewee S: Not every day we can sit out here because it's blowing.

Austin: How do the barrage gates have an effect on farming, the environment, and water quality?

Interviewee R: I think it's pretty it's pretty much been answered.

Interviewee S: It is flood control and maintain the level of the lake and in our view it has maintained the wetlands at a constant and I think you can argue that you're bugging it up because it's not natural and it should just sort itself out.

Interviewee R: I mean there would be people that say that its changed the way the whole community has evolved because a lot of the land even where we farmed and right up as far as Kahutara has got sand dunes and those we understand were created because even though you've got flooding in the winter the lake would go very low in the summer and every time it blew like it does it blew the sand out of the side of the lake and you ended up with these sand hills and that's how they evolved, we understand. Well that's not happening to the same degree now so is that a good thing or a bad thing? It cleaned the lake out of sand, but what happened to the birdlife, I don't know. Was that good for them or bad for them? I don't know.

Austin: What do you know about the barrage gate resource consent?

Interviewee S: That it comes up for renewal. I have been at meetings where they've talked about it and I thought that somebody else would worry about that so I haven't worried about it.

Interviewee R: I know it was mentioned in that video even, but I can't remember what it said.

Interviewee S: They have to apply for it and if someone stopped it, it would be chaos. It could happen, that if it didn't get a resource consent that they would be asked to take it out and we would be back to where we were. I hope there is enough common sense around the place that that doesn't happen.

Interviewee S: In our opinion, it was more beneficial than it was a derogatory thing they did, or bad thing they did. But I do think that the polder scheme that they were proposing to do more dairy farms probably in retrospect that wasn't the right thing because they would have been bringing in more land that was lake edge that really should have stayed lake. What we gained and the next load of people didn't, we weren't reclaimed land. That was going to be reclaimed land.

Interviewee S: It would have made a huge difference how we farmed if that had gone ahead. We would have had more neighbors and that sort of stuff but I think they would have been good farms.

Interviewee R: Maybe. It would have been a lot of expense and whether they would have been that affective because some of the land down there on the other side of the river on the eastern

side was more wetland. Like when they made the diversion a lot of the dirt was taken out was put into this low laying area so the farmers that got that land were actually farming on- that one swamp area became reclaimed land and I don't know that some of their farming was assisted initially by the fact that it was dirt that was reclaimed dirt. It was hard to farm.

Interviewee S: I think one of the issues that we haven't talked about is that once we started irrigating we realized that salt comes back from the sea and I think that had an impact on some of the soils. It certainly had an impact on irrigation systems. So, we've had to manage that.

Interviewee R: I don't know if you are aware that when the mouth of the lake at Onoke is shut in a southerly situation in the summer and we were irrigating way up where we were. Within three days of that lake mouth being shut, we had salt in our irrigation water. So we couldn't irrigate anymore.

Interviewee S: That had become a real thing we had to manage. I don't think it has anything to do with water quality, it's probably a good thing. It might kill a few bugs I don't know. I don't think it changes the fish life or anything because it's the natural thing, but it's a pain to try and put on the grass.

Interviewee R: It's like paraquat on land. It just burns the grass and kills it.

Interviewee S: So that is certainly something we had to manage.

Austin: So, going back to the operation of the barrage gates, you said your main issue was when they paint the gates and leave them open? What do you think a reasonable compromise would be?

Interviewee S: The issue was that the contractor that did the job said he was going to do it in six weeks and it took three months to do it. So, it's really just enforcing the-

Interviewee R: And making them stay there and do it because there were days that we felt that they weren't on site doing it and really getting on with it. We don't know all the answers.

Interviewee S: We don't know if he was crook or something, but basically I didn't feel like they held up to their end of the contract.

Interviewee R: We weren't partied to know exactly why it was being slowed down. I mean some of it is if you get wind, you can't sand blast and if we get a big lot of rain up here and the river comes up, well they have to deal with the barrage gates and put them back down or something.

Interviewee S: Basically, people need to do what they say they are going to do. Simple as that and just enforce- and I know sometime it gets very hard to enforce stuff- but basically if the contractor had done what he was contracted to do, the job would have been finished in six weeks, end of the story, and we could have managed at that.

Austin: Regarding the Ruamahanga cut off, it's stagnant?

Interviewee R: It stinks.

Austin: How does the stagnant water affect you guys as farmers?

Interviewee R: Just the smell of it. It didn't physically affect us.

Interviewee S: We were far enough away that it didn't. But it should definitely be- some fresh water should definitely be put on there.

Interviewee R: Fresh water to open it up either at the lake end or take it from the river to freshen would definitely assist it but getting rid of those silly little fish would help, too. I don't know how one would do that.

Austin: So they need to put in some sort of culvert?

Interviewee S: Yeah, that's what they need to do. There's plenty of talk about it, they just need to do it.

Interviewee R: Because it is a nice body of water. It just doesn't get enough through, like in a fish tank. Over the years, at the area that would have been where that river would have entered the lake, has just built up and so at certain times it's so shallow that it's virtually non-existent. I know that one day when they were working on the barrage gates and I went to go get cows in I saw that the lake was exceedingly low and I was on a motor bike and I drove almost half way up

the lake on the lake edge. So I actually went across that area and I should have sunk but I was able to go right up there.

Interviewee S: There are a couple of local farmers down there that are really pushing to fix that whole problem. But it would certainly add- it would be a nicer place.

Interviewee R: The barefoot water skiers have used that regularly and it's nice that they are able to.

Interviewee S: I can only imagine that they hold their mouth when they fall off because you wouldn't want to drink it.

Interviewee R: Just horrible

Austin: How much do you think you benefit personally from the development scheme?

Interviewee S: I think out of 10, it has to be 9. It has to be right up there because I don't believe we would have been farming there.

Interviewee R: We wouldn't have had 30+ years of non-flooding situation on our property, I believe, without that.

Interviewee S: I think for us personally, I think we are the benefit of that, whoever decided to do it.

Interviewee R: And I can't say that it has been detrimental to birds or fish or what I've observed and I mean I'm not a person who is really into birds or fish but to me it hasn't been bad for them other than the tench.

Austin: Did you have to contribute to the annual maintenance?

Interviewee S: Only through our rates.

Interviewee R: Because we are part of that scheme, where we live down there, it has meant that we did pay higher rates than other people in the Wairarapa.

Interviewee S: It's all classified and there's a different rating system, which I'm sure you have all read and so not all our land but quite a bit of it was at a very high rate, but I think that when you are comparing farms we probably pay twice the rates that other farms of that same size pay. So it's quite high. I think it would be some of the highest rating for regional council rates as oppose to other rates. So yeah, I think we have done our paying.

Interviewee R: I have to say that when we first went down there, where we had our farm was actually balloted farms that when the government used to do farm balloting and so our farm was actually a balloted farm. Now I won't go into the details of that because you probably aren't familiar, but if you want to find out I'm sure you can. It was like we won a farm in a raffle and then paid for it but not at the high rate that maybe some would have.

Interviewee S: Government policy to get young people onto the land. We fitted the criteria.

Interviewee R: So we were there in a slightly different manner to perhaps some farmers that move onto a farm and so we were prior to that sheer milking and we were sheer milking near Carterton and we were on a very lovely farm there and so when we got this one, we were very skeptical because at that time there were only two dairy farms that we knew of in that area and it didn't seem like an area that, even though you looked at that map and they were saying it was good dairying, there weren't many down there and so when we went down there it was a bit unknown whether it would be as good. Well it has been as good and mostly because of what has been done with that lake and the barrage scheme.

Interviewee S: Probably we didn't appreciate all that really at the time. We wanted a farm. It just worked out and we fitted the criteria.

Austin: Since we are trying to find out ideas so they can implement them in the next resource consent, what issues do you think are the most important as far as the operation of the whole scheme?

Interviewee R: Most important future or most important past?

Austin: Both.

Interviewee R: Well, the most important past has to be the control of the flooding issues in the lower valley, wouldn't it? Because it effected so many farms and so much land. I'm sure for some of those farmers, it was absolutely miserable having the floods that they did get and don't get now but I think the biggest issue going forward is the maintenance of the river and of the scheme and to, I foresee, just making banks higher is not going to be the right thing to do overall because sadly, with the el Niño, all the climate change, the whole thing, I personally don't think that if we got a big occurrence like has been happening overseas I'm not sure that floodway at the moment would cope. This is my opinion. Noel gets sick of my opinions, but I'm not convinced it would cope and I think we would get flooding issues again because I am quite sure that just building banks higher is just not actually going to make it better and I think they do have to dredge it or somehow keep the water flow going better than it is in the sense of there are cultural issues there's all sorts of issues now coming into it that, whether you open the mouth at the sea and let it all out when you should or not and the build-up that's occurring in the lake, the bottom lake I'm talking about and in the river and therefore when there is a high flood situation, how close that is coming to the top of the banks. Where we were farming, you would go along the road and the water would be up here (pointed about eye level) and it would be higher than you were in the car in places and I think that one day that's going to be too much and it's going to break out again and we will have issues. So to me maintenance is a huge issue. Not so much for the lake, but for the rivers in that area.

Interviewee S: That comes back to just good management and that means good people.

Interviewee R: And good people with local knowledge being used. Not people in offices in Wellington *passionate* who don't have a clue they really don't.

Interviewee S: As long as you've got good people managing it, that's as good as you can do.

Austin: So, if there is one thing you would like to see going forward, it would be the management?

Interviewee R: Yes and management by local people that understand the situation.

Interviewee S: No, no. You can't. Just good people. That's all you have to say.

Interviewee R: No, good knowledgeable people.

Interviewee S: It doesn't matter where they come from.

Interviewee R: Yeah, I agree.

Jena: What are your opinions on the wetlands?

Austin: Like boggy pond?

Interviewee R: I actually have issue with that one, too because technically a lot of the water in boggy pond is because it's pumped back into it at expense and to me that is a false wetland. We've got Lake Wairarapa that we're maintaining with the barrage gates which is technically "false" but at least you aren't pumping water back into it to make it work. Boggy Pond is lovely. You drive in there and it looks nice. It looks like a real nice wetland if you didn't know that was how it was being maintained and I think that to have something that is a bit artificial and try and have to pump it back, that's a bit hard to justify really, but obviously it is being done and it looks lovely and it works so why change it? I think wetlands have definitely got a place in the world for everyone and they're fast gone so the ones we've got we should maintain as best we can for everyone. It has got to be monitored, be a bit for everyone, but definitely retained and not turned into farms anymore.

Jena: So, do you think there is a need for the wetlands then?

Interviewee R: Oh, yeah. They are part of the ecosystem or the whole picture. To me, they've got their place, just like the ocean has got its place, even if it erodes around the edges, but everything has got its use.

Interviewee S: The farmer down there (points) he is a dairy farmer. He has installed his own wetland to try and get the water purer before it goes in.

Interviewee R: He is sort of taking water that's coming, working on a purification within his own wetlands, then letting it out again after and so they have developed this area within that farm down there (points) to do that.

Jena: What do you think of that?

Interviewee R: It's still early days because he has only really just finished it, but if it works and it should.

Interviewee S: He is far more motivated than we are in the sense of trying to meet future criteria

Interviewee R: And learn more about it.

Interviewee S: Because he wants to carry on farming.

Interviewee R: Well he is our age, but he has been studying it more than we have.

Austin: So, this is what we are relaying back to the Greater Wellington Regional Council. Is there anything else you would like to tell us?

Interviewee S: No I don't think there is anything we want to add.

Interviewee R: No, I don't think so, but most of what we have said we have said at our own meetings or something because we have had meetings with the council people each year in relation to the maintenance of that drain on our property so in that sense we have had people that we can talk to on a regular basis, which a lot of farming people perhaps haven't. [... Note: the tench fish in the cut off were brought up again...] So, that is an issue that does need addressing quite definitely.

B. Interviewee T

Jena: Can you describe your farming activities and lifestyle?

Interviewee T: I do a bit of a mix with dairy and sheep and beefing and some cash cropping. Basically, dairy cows, fridging bowls, and finishing lambs.

Jena: How long have you lived in the Wairarapa region?

Interviewee T: I've lived here basically all my life. But yeah, last sort of stint has been fifteen years, yep.

Jena: Are you involved in any organizations?

Interviewee T: Federated farmers yeah, so we are members of that but I'm not involved in the administration. Yeah, Wairarapa water users group, it is irrigation group, yeah.

Jena: How do you value Wairarapa Moana?

Interviewee T: Yeah, we've always been there, and it's important to us, so we really value it highly. But It is what it is, its shallow, it's not um, it's not a lake for going water skiing or anything like that, it's basically a big wetlands, we value it in that context.

Jena: Can you explain the quality of the soil?

Interviewee T: Most of our soils are clay limes. They're okay, for the Wairarapa Valley they are good but certainly not the best.

Jena: How are the fish important?

Interviewee T: Well it depends what you mean. Exotic fish aren't important at all, some of them are pest fish. And I guess the native fish are important in terms of maintaining the, sort of, original ecology I guess.

Jena: How do different bird species impact the region?

Interviewee T: Some are positive some not so positive. A lot of the introduced species are pests like the Canadian geese. And then the native ones are nice to see, I'm not sure what role they provide in terms of improving the environment or ecology, but they're obviously important to us so they need to be maintained.

Jena: What is the state of the water quality in Lake Wairarapa?

Interviewee T: I don't really know to be honest. I think there is, there is a perception that it is poor and I am not convinced there's been massive changes in recent times because in our region, there hasn't been intense vocation of land use as much as say Canterbury and those sort of areas. So yeah, I think the perception is poor, in reality it probably needs to be improved, but it's not dire.

Jena: Do you think farming affects water quality?

Interviewee T: Yes, I do, yep. I would like to say in terms of Lake Wairarapa and water quality, I think a lot of that has been driven from what comes off hill country, through erosion, rather than what actually happening here around the lake edge, yeah.

Jena: How do the barrage gates affect water quality?

Interviewee T: I don't know, yeah.

Jena: How is the area important for recreational activities?

Interviewee T: It was important for, yes it is important for recreation. The main sort of recreation is like duck shooting, fishing, and white baiting, and those sorts of things.

Jena: How does Wairarapa Moana provide for your needs?

Interviewee T: Well, it doesn't really. Well, it's nice that it's there. So, I mean it doesn't really, the lake itself doesn't provide for us in anyway, financially or anything, but the river does, in terms of we draw water from it.

Jena: What is the most important aspect of Wairarapa Moana?

Interviewee T: Yeah, for us, I mean recreation with the river and yeah I'm not sure how to answer that, sorry.

Jena: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee T: Yeah, I know quite a bit about that, yeah, that is very important. Yeah, I mean the scheme is about, supposed to be about 50 or 60 years old I think, and it's... I mean, this whole area would be un-farmable without it pretty much so it's huge benefit to this area financially, yeah. It is very important for us that it's maintained

Jena: How does the operation of the gates affect daily life and farming?

Interviewee T: Not so much. It doesn't affect our farm so much, but it does affect farmers around the lake. We've only got a small section of stuff along the lake and we tend to be high enough it doesn't really affect that. But, if the gates aren't operated properly then obviously lake Wairarapa gets very high and floods the surrounding farmland, so that's actually, not so much for us, but for other people.

Jena: How do the gates affect the environment?

Interviewee T: Well I guess, there is the effect of manipulation of water levels, now that can be good and bad, and I wouldn't know whether it is good or bad, but that's what they are designed to do. Yes, I'm not entirely sure what their environmental impacts are, but there will be impacts.

Jena: Do you believe the benefits from the gates are worth your annual investment?

Interviewee T: Yes, absolutely yep.

Jena: How does the cutoff affect you?

Interviewee T: Well, the cutoff is, I'm sure you guys have already been told this, it's the original water course And it's been basically cut off since the scheme went through and there's been no freshwater go and part when the lake is very high and the water comes up and seeps in so its stagnant water essentially its only 100 meters that way so it does affect us. We do draw stock water from it and that quality, the quality of that is poor this time of year, when you get

algal blooms. And it's, unfortunately, because it's not recharged from any fresh water source it's pretty poor quality water way. So yeah, it would be nice to see it improved if that's possible.

Jena: Is there anything that can be done to mitigate the negative effects?

Interviewee T: Basically, only recharging it from either the river or the lake or both with fresh water.

Jena: We talked about flooding a little bit, do you think flooding is a major issue?

Interviewee T: Yes, it's not for us because of the scheme so we are lucky but if it wasn't for the scheme it would be pretty tough and the people that are affected by flooding, you know its major, it can be major.

Jena: Do you think the flooding is well managed?

Interviewee T: Yes, I do. Yep, on the whole, I sometimes question some of the decisions made but it's always easy to criticize when you're not actually in the driver seat so yeah.

Jena: Do you agree with the current flood management or should it be changed?

Interviewee T: Yes, I do agree with the current flood management, yep. The only way I would like to see it changed is if it is enhanced in any way shape or form.

Jena: What other issues regarding the flood prevention scheme do you think are important.

Interviewee T: Just the maintenance of it in terms of stopbanks, barrage gates, up near the bottom lake, those sort of things are important.

Jena: Are you aware of any conservation efforts?

Interviewee T: Yes.

Jena: Do you think there needs to be more?

Interviewee T: Depends how much central government is willing to commit. But they committed a million dollars for a cleanup fund and that was great, they got a lot of stuff around

the lake and these water courses. I think if that sort of investment was to keep up a bit it would be a lot done but it's not a bottomless pit, sorry it can be a bottomless pit in terms of money.

Jena: What do you know about the resource consent for the barrage gates?

Interviewee T: Yeah, I don't know anything apart from its coming up in 2019, yeah.

Jena: If you had to pick something to be addressed first, what would it be?

Interviewee T: In the resource consent process, I think that the priority should be maintenance of flood protection and yeah it makes me nervous that that could be compromised in some way because it's a huge investment and yeah I think they need to be maintained and the integrity of that needs to be considered.

Jena: What are your opinions on the wetlands in the region?

Interviewee T: Yeah, I think they are important, they are important in terms of one biodiversity but also in terms of cleaning water before entering main bodies such as lake Wairarapa and so forth so they are very important, and if they can be enhanced then that's all good.

Jena: Do you know about the Ramsar status at all?

Interviewee T: I know a little bit about it. That idea was thrown about twelve months ago I think and I don't know where it's got to. Yeah I think that there is a little bit of nervousness among landowners about potential implications for them but personally I don't know enough about it to make a comment either way.

Jena: What are your thoughts on irrigation?

Interviewee T: I think it's good if managed well and on the right areas. And if it's not then it is potentially bad but yeah, I mean for us it is really important and we wouldn't want to see that compromised ever.

Jena: What do you think of the current lake levels?

Interviewee T: I don't really know, but there's been a lot of talk about that I'm not sure whether right or wrong. Mainly because they don't affect us but it does make me nervous if they want to keep the lake at a higher level. Then there is no capacity to take that water and if there's no capacity to take the water then it's going to stress the infrastructure, stopbanks everything and that would be a concern so yeah you'd have to say that probably the current lake levels are where it needs to be to have that safety valve.

Jena: Do you have anything else you would like to say?

Interviewee T: No, I think when they are, my personal view when they are considering the application for consent is that they have to consider the financial, social, and environmental impacts of whatever they do and so it can't be one of those in isolation you know I kind of get a little bit concerned that there is a big push for one or the other so those three have really got to be weighed up and really have to find the right mix to get it right because I'm not sure how long the consent lasts for but I'm assuming that its ten years or something like that, so it's a long time to live with the wrong decisions.

Jena: Do you prefer shorter or longer resource consents?

Interviewee T: For us, longer ones, because it gives us security over the infrastructure that we've had to pay to put in, for irrigation and stuff like that. Plus it's a cost, when you apply for a renewal of consent, it's a cost. And yeah we are good enough for that at the moment.

Jena: Should the funding plan be changed regarding how the flood protection scheme is paid for? Is it worth your personal investment?

Interviewee T: Yeah so now it's paid for in our rates. Not really, no. It's not something I've given any thought to but I can't imagine there would be any other way they could do it fairly. Yeah, I'm not really sure.

C. Interviewee U

Austin: How long have you lived in the Wairarapa region?

Interviewee U: 50 years. Not fifty years here but in the region.

Austin: How many years here?

Interviewee U: How many years have I been here? 35 years, 34, 35 years.

Austin: Have you farmed that entire time?

Interviewee U: I've been in the agriculture industry either grew up on a farm, indirectly worked not on a farm but on the agricultural side of things I worked in a slaughter house as a meat inspector when I was younger then moved out of that and now farming in our own right here, so pretty much all my time has been involved with agriculture and farming.

Austin: Can you describe your farming activities and lifestyle?

Interviewee U: Farming activities is dairying and lifestyle... Yeah.

Wife: Do you mean in terms of what he does on the farm?

Austin: Yeah.

Interviewee U: Well I don't milk the cows anymore, I have contract milkers that do that. I do a lot of the strategic planning and looking after what we call the dry stock the non-milking animals and do a lot of the planning and implementation of hay and silage and crops that are required to support the dairy platform and yeah look after young stock.

Austin: Are you involved in any organizations?

Interviewee U: Yeah, I do have an involvement but I'm not terribly active. So mostly revolving around the dairy industry, those kind of things. I am also involved in the committee that looks after or helps look after the lower valley flood protection scheme so I have some input on that as well.

Austin: Are you involved politically in the region?

Interviewee U: No.

Austin: What do you value most about Wairarapa Moana? Why?

Interviewee U: There's two ways I can look at this. First one, is to support my business and the flood protection side of it and that's been created over decades so that has a direct impact on our ability to farm the land here not all of the land but quite a big proportion of it. So that's from that point of view. I mean it's a nice area to farm very picturesque it's a nice place to live so yeah that's probably the other side of it. We actually like where we live. The cultural are not so important to me because I have a different I haven't got the same cultural understanding or background as some members of the community so it doesn't rank as high for me but having said that the actual environment that's been created is really important to us but that's reflected in as it stands now what was done in the past to give us an environment we can successfully farm in and continue to do so in the future.

Austin: How does Wairarapa Moana provide for your needs?

Interviewee U: Well directly, we use the lake to get irrigation water so that's pretty directs in terms of helping us in periods of dry. I guess the aesthetics to it like I've just said that has some value to us obviously and then all the protection work that's been carried out over the years and development to make what happens now possible.

Austin: What's the most important aspect of the water?

Interviewee U: Say that again, sorry.

Austin: What's the most important aspect of the water?

Interviewee U: Of the water. The most important aspect of the water. Well, you can't operate without water and in terms of a farming point of view you can't operate with water so the irrigation side of it is very important to us. You know we also have a system here in the winter where we pump water into the lake because our land is low-lying otherwise we'd be flooded. So you know the movement of water being able to having some measure of control because of

where we live and then on top of that there's all the recreational type things that other members of the community partake on and once again the actual visual aspect of it you know having the lake out there to look at, that's you know nice. Yeah I think probably the control you know I can't think of another word to use to describe it being able to have some form of control over that water body is fairly very important to us.

Natalie: So when you pump water or put water into the lake, do you need any sort of permission?

Interviewee U: We have a resource consent for both taking water. At this stage we haven't gotten a resource consent for putting water back into the lake and that's because the pumps systems we've got are very old and they were established long before the resource management act came into being. And there was quite a bit of discussion about that going forward. I could go into a few things about that, I don't really want to. Well, we are sort of wanting it to be left as what they call a grandfather clause, in other words they are all existing there just leave them alone. If we do have to get resource consents it would mean there would have to be some monitoring that goes on and that would probably want to know what the water quality is like the water we are putting in there and if it doesn't meet whatever standards come out they want us to require us to treat it in some form. Logistically that would be quite difficult to do and very expensive. And although I've got no desire to be degrading water quality there has to be a point somewhere where the environment has to cope with the man's activity because if we keep trying to keep the environment pristine at some cost we are not going to be able to be viable, because it's going to cost too much, if we are not viable then how can we do environmental protection work. So you know there has to be a lot of common sense and a lot of thought put around some of these idealistic things I mean they're great ideas but they got to be worked they got to be able to be afforded and maintained. And probably that's one of my biggest concerns about where we are going with a lot of this stuff that is being presented now and around environmental protection and resource management and that kind of thing.

Austin: Can you explain the quality of soil?

Interviewee U: On my farm or just generally around here.

Austin: I guess both.

Interviewee U: Yeah, well it's quite variable. The soil just around the lake bed is highly fertile its subject to flooding in some cases because it is low-lying hill so surface flooding is enhance so that's why a lot of the farms have got flood protection and pumps system because some of the land is at sea level or very close to sea level so as you can imagine the drainage is not great because it's at the bottom end of a valley system near the sea but the soil is good quality soil subject to a bit of winter wet, it gets wet in the winter that doesn't dry up that fast, in the summer it can in that respect its good. Other parts are lower quality some of the more low lying hill stuff is not such good quality different soil altogether but it's still been made quite productive because it's been farmed now for many generations and then you've got the hills over here which provide a lot of runoff into lakes, the streams and into the rivers and ultimately into the lakes and that's basically that's the way it has been forever and so you know that is very low quality soil its top soil and its very steep.

Austin: But it's pretty good here.

Interviewee U: Yeah where we are farming yeah its good yep.

Austin: Do you think flooding is a major issue in the region?

Interviewee U: It can be yep. And it was in the past prior to the 1970s, before the lower valley scheme was implemented it was a major issue, that was before my time living here. We were made very well aware of it through historical and anecdotal evidence and photos where the floods used to come to and how long they stayed there and that's why the lower valley scheme was initiated and built in the late 60s and into the 70s and more or less completed in the 80s yeah. So flooding is a major issue back then and can still be potentially.

Austin: Does flooding affect you?

Interviewee U: Yes, but not to a huge degree.

Austin: Is flooding well-managed?

Interviewee U: Generally speaking, yes.

Austin: Do you agree with current flood management or should it be changed?

Interviewee U: I could say yes, but then if I didn't know about so called climate change which is obviously happening and sea levels rising, yes we are going to have to change things. But if you put that aside, the way it runs at the moment, it's adequate but looking into the future it's completely different.

Austin: What do you think of the current lake water levels?

Interviewee U: They probably need to be kept lower and especially in the winter time. Whether that can be achieved I think it can be achieved because for example when the barrage gates are being maintained or they open them up to clean them and paint them the natural level of the lake is a lot lower. When looking out there you can see a lot more sand because it is pretty shallow. The way the lake system was designed for the barrage gates it was designed as a flood protection system and to store water if the water can't go and get away from the river and get into the sea because there is a high sea or the bottom lake is blocked obviously the water system builds up risk of flooding so if the lake is low they can let water back into the lake and use it as a pawning area until such time that they can control or get control of what is happening further down then open up and let the water go. If you have already got the lake full then you haven't got that happening, you haven't got the ability to be able to do that so that puts a lot more pressure on the stop banks and levis or whatever you guys call them and that can be an issue erosion around the lake is quite severe in some places and that's the result of a high lake because we get a lot of wind a very strong wind and it can make really quite sharp nasty waves and if the lake is high then it will erode the banks so there are quite severe areas of that happening. If the lake is kept low then you don't get that to the same degree so it's you know I think it could probably be managed a little bit more closely with the technology they have available now.

Austin: How are the fish important?

Interviewee U: They don't have an impact on me and I haven't got a cultural interest in them, but it's nice to see them there and they are part of an aquatic system that is probably valuable to our overall water quality so from that point of view and I don't think we need to do things that will necessarily degrade the environment. From my anecdotal evidence and that's not great I

haven't seen any change in the fish but then I haven't monitored them I've only seen what I've seen so that's a very sort of unprofessional type way of looking at something because I haven't just got a huge interest in them, but I do know there are lots of fish in the lake and I do know that because I've seen them and I've even seen seals in the lake so and I've got photos of those. So yeah there are a lot of introduced species as well, not native fish, yeah tench and perch. There could even be some carp, but I'm not sure. But basically, it is nice to see them but they are not important to me in terms of my business or my farm and apart from they form an ecological system that probably beneficial to us.

Austin: How do different bird species impact the region?

Interviewee U: The native birds are fine, I think they are great to have around and the introduced species are a real problem and particularly the Canadian geese and to a slightly lesser degree the black swan. We have a major problem with the geese. They will come and destroy crops, eat land on the pasture, defecate there, and basically make it virtually inedible for livestock. They carry a bit of disease, salmonella is one in particular and they breed really really quickly and in vast numbers so they are an issue a big issue. I think they probably have a big detrimental effect on our water quality in the lake just because of their numbers and the byproducts they produce and they probably have an impact on the native less dominant type of species there as well. There are also the mellow ducks and all those kinds of ones and sports birds as well but nothing like an issue like the swans and the geese are. So probably are the two main issues and I think they are quite serious.

Austin: What is the state of the water quality in Lake Wairarapa?

Interviewee U: I think overall is pretty good. I mean I've lived next to this lake as you know for a long time and that's a very typical view out there and that's what it look like most of the time and you know it's that brown turkey color and that's not because it's shitty water, that's just its natural state. There's been a lot of talk about water quality and I think agriculture has been unfairly singled about causing degradation, in this area I'm talking about, and the urban areas are probably been flying a little bit under the radar and not coming up with big enough claims quick enough to mitigate their issues that they have in this document that they have major issues with their water quality, you know I'm talking about sewage and drainage ending up in our

major water ways and we've to me it's a political thing a numbers thing, more people live in towns, there's more votes there so they don't rock the boat there too much, it's much easier to go talk to individual farmers who a lot of them are smaller businesses, it's much easier to put pressure on them. I think we are being singled out a little unfairly. I don't think that, I know that and I feel that. It almost feels like when there is a campaign going and you read articles in the local paper about some issue to do with water quality and there is nothing spoken about the urban problem and it's all almost I think to myself how the Jews felt in Germany in the second world war, you know that's almost how it starts to feel just the way it's written in terms of singling out and blaming. So I feel quite strongly about that.

Austin: So you think farming, the effect on water quality

Interviewee U: I don't think it's as great as what it's made out to be. I mean a lot have farms have done a lot of things to improve water quality and it has not been documented greatly and I know on how farm for example we have a lot of drains that are manmade and it was surprising when they did a survey of the aquatic life in those drains how great it was you know and a lot of native species as well as introduced species and those drains are managed, they are cleaned, and we pump them because that's how we get rid of our surface water in times of heavy rain, and it's quite a vibrant life of animals and things.

Austin: So I know there has been a controversy regarding the cleaning of the drains?

Interviewee U: Yeah, there's all sorts of. This is once again driven from the resource management act and how to look after the native flora and fauna and I have a view on that I think that's great I think that's the top drawer thing but at the end of the day we have a system in place so that we can farm the land efficiently and productively and my bottom line is that has to be maintained because otherwise we can't do that. And then we become less profitable, less productive and less able to afford environmental improvements. Ideally, idealists would say we don't want them cleaned, but that's just not practical, there is somewhere in between that can be managed and I am a great believer in that but it's got to be practical. You know the normal way to clean it if your pumps down here and you can back up and clean it or the environmentalists will say start at the top and work your way down because all the fish and wildlife can keep moving away from you but that's just not practical. So just little things like that can be done.

And I mean putting wildlife... eels when you clean the drain putting them back in after, I've got no problem with that, you know you don't have to be a butcher to do it nicely but at the end of the day we need to be able to maintain those systems to operate effectively and just some common sense around best practice around maintaining clean water ways is all that's required. And I'd be really disappointed if we had to go down the application track. In other words, we had to fill out forms and consents to do it. Because that just makes a whole paper trail of bureaucracy and it just slows the whole thing down. I'd be disappointed if we have to go down that track just to do thing that we've been for years and it's been shown it's not detrimental but there have been prosecutions for people that have cleaned drains and unknowingly done it but someone's complained and they've been prosecuted for it which once again is a joke really.

Austin: So obviously if you ask anyone or a lot of people in the region how to improve water quality they are going to blame it on the farms, but other than that how could it be improved?

Interviewee U: Well I think the initiatives that have been taken like the one about fencing off water ways I think that definitely helps like excluding stock from waterways helps, but I'm not all together sure, and I'm talking about here in my area here, that our water hasn't degraded at all and I don't think it's any worse than it was when I first came here and in fact it's probably better that's mine and you know I live pretty close to it I know what's goes on down there. In some other areas yes there has been a change there has not just in the quality but in the quantity as well but then that's basically from pressure from human activity and whether it be farming or anything else for that matter and that's what happened. And the way to mitigate that is to try to have systems before you start doing what you're doing. If you can do that, then it should help.

Austin: What are your views on irrigation in the region?

Interviewee U: I think irrigation is underrated. In the whole Wairarapa region there is huge potential for irrigation it has a lot of dry land that suffers from driers from the summertime so the productivity could probably be far greater and we have a massive amount of water that disappears in the winter time out to sea during the winter time you know we have a massive catchment that produce a huge amount of water and the only way to collect that water is to build dams but because of our resource management act it's a very difficult thing to do that and the community as a whole has do decide how far they want bureaucracy to go to stop things that

could be helping make our area more profitable and able to sustain a bigger population because that's what's happening.

Austin: What is your opinion on the current status of the wetlands?

Interviewee U: I think they are probably pretty good. I think there has been a lot of work done, not just recently but over a long time to improve them there have been fenced and planted and reestablished so I think they are actually progressing, I've got quite a large area I fenced years ago it's not directly next to the lake and so you know and we do try in areas where we got native stuff we try to fence off and keep so I think generally speaking I think its improved. I can remember coming down say to the south Wairarapa, the Ruamahanga diversion and barrage gates and I can remember in the 1970s coming down there when the lower valley scheme was being built and all that land where that road comes down there was no trees and pretty much bare, and you look at it now and it looks fantastic, a lot of them are not native trees but it looks really good and so you know to me is a vast improvement what it was 50 years ago, a vast improvement.

Austin: Are you aware of the Ramsar status?

Interviewee U: I'm aware of it, yeah.

Austin: What is your opinion on the Ramar status?

Interviewee U: I don't think it's required. There's already a conservation order on the lake. There's already the resource management act that governs the lake, the department of conservation and the iwi have got a lot to say on the lake. There's already a There's about seven layers of administration that control what happens with the lake and I don't think we need anymore. That's basically where I am with that.

Austin: What ramifications does the Ramsar status have on the farmers?

Interviewee U: That we've been told but you just don't know what the next move will be in three years time when you have a status like that and whether they decide to change and how the status stands and what effect that will have. So I view it with a little skepticism and suspicion perhaps.

Austin: How is the area important for recreational activities?

Interviewee U: Up until four or five years ago there wasn't a lot of recreational activity around the lake. The cycle trail that's opened up has obviously increased a lot of foot traffic and that sort of thing so now it's part of the national cycle trail down the western lake road which is the western side of the lake and also the district council on their website have advertised areas around the lake where you can go walking and free camping and things like that so that's obviously increased the activity around the lake. As far as people on the water itself it is not suitable for recreation apart from a bit of fishing because its shallow its wind swept and it's quite dangerous. People think because it's shallow that it's not dangerous but it is so you hardly see any boats on the lake for those reasons.

Austin: What about recreational activities on the Ruamahanga River?

Interviewee U: Yeah, along the river yeah that's different. There's a lot of activity during the summertime. There is canoeing and water skiing which is great.

Austin: What do you know about the Ruamahanga Cutoff?

Interviewee U: What do I know about it? I understand very well how it works. I'm not actually sure what I need to say.

Austin: How does the cutoff, does it affect you at all?

Interviewee U: Well it does. It's all part of that lower valley scheme the barrage gates that improved our road access, you have to understand how the rating system worked were prior to that. This area was completely isolated the only way out of here was through Featherston, now we can go through the bottom of the lake and up through the country... that road gate didn't exist before the barrage gates were put in and also this area you can see jutting out behind us on the lake, that land there the only way to access that was from... so it's had quite a big impact in that respect. So it's been very positive.

Austin: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee U: Yeah, yep.

Austin: How important to you are conservation efforts regarding Lake Wairarapa? Why?

Interviewee U: Oh no, I think they are important.

Austin: Do you think there needs to be more anti-pollution measures to be taken? Please specify.

Interviewee U: Yeah, I think they could they just need to look at other sources of potential pollution. I could give you an example of how some of that stuff works like at ground level, a few years ago we added a dwelling to our property and because it was only small we were able to use the same sewage system but a district councilor came down and said because we had done that we would need to put in a whole new sewage system which was going to be quite expensive and I argued with her that that wasn't required at the time we put the application to put the little accommodation on there was no talk of that and this was a retrograde thing they were trying to make us do and it basically required us to ... and I just said to her if you can write me a letter then I'll respond to that and so she did and I said I'm not going to do anything and her response was we could actually put a notice on you and you will have to cease using that system until you've upgraded it and I said if you do that then you'll have to all the other rural dwellings down here because they all have systems like this and do the same to them, you just can't make me do something. Furthermore, Featherston town they actually drain into Donald Creek which ends up in Lake Wairarapa, wouldn't it be better to look at what they're doing and sort all that out. So that's just little things, nuts and bolts, that happen and that's why you feel pressured because you are an individual, small business, they come along and say something to you but it would be a different story if you went to the district council like the Featherston council and you ask them what they think and they got 1500 rate payers that are up in arms because they got to spend 5 million dollars so yeah there's a bit of that type of stuff that goes on which is a little bit unfortunate.

Austin: What do you know about the Barrage Gates in their current operation?

Interviewee U: I don't know how they operate exactly, I know that they've been setup to operate automatically rather than manually so they can monitor the lake level and they can open the gates and close the gates as required based on their water levels and what they need to do in terms of flood protection. They, I've been told are built on land that is not stable... if there is a

major earthquake. They are expensive to insure and maintain but that's just the nature of the beast. They are really really important to how we are protected from flood, really important. I know now that they are being operated as an environmental tool rather than a flood protection tool, I haven't actually been told that but I get that feeling and that's based under what's required under the resource management act for the barrage gates and I think that's once again, I know the resource management act says the environment is the top of the pile but in the situation that goes down there I think protection from flooding to me, that's my bottom line. The environment is important but they can just fit drop down a step, if we need to open them cause of a flood issue then that's what has to happen but you know there is a strong body of people that would not agree with that at all you know and as I understand it there is a quite a body of people that want them decommissioned and taken out and go back to how it was naturally because they were put in a natural channel and that's how the lake used to, I don't know whether you guys understand anything about the lake, but this lake the river used to come in a lot further up. You see that point of land and then beyond that, that's where the river used to come into the lake and then drain naturally out where the barrage gates are. There was no control system there, so the lake was subject to really high. So that's what the whole diversion thing so I wouldn't, to me its paramount that that's maintained and for that reason.

Austin: How does the operation of the gates affect daily farming?

Interviewee U: It is critical in terms of flood control so the timing of them and the managing of them is very important because they have a big impact in terms of how quickly we can get water because if we have a lot of rain and our flood pumps need to be working to lower the water because otherwise it fills the drains and floods out onto the paddocks. If the lake for example is high it means our pumps are less efficient because they have to pump out against water, so if it's really high at that time it's an issue for us. The operation of the gates needs to be monitored very close to in terms of what the weather is doing. They got lots of monitors around what flows in the river, how much rainfall, what the tides are so they need to be able to operate them to optimize the timing to either hold water or let it go or let it back in and that's critical that they got it right.

Austin: So specifically you want lower water levels.

Interviewee U: They just need to be when there is a risk of a flood event which is usually the winter they just need to make sure that they have sufficient capacity in the system to cope with that water without causing a lot of damage or flooding.

Austin: How do the gates affect the environment?

Interviewee U: I presume we are talking environment in terms of fish and birds and water quality and that kind of thing. I don't think it makes a lot of difference to be honest. The gates get open and shut regularly, there is fish passage in the gates so one of the gates has a gap in it so fish will go backwards and forwards. I know the regional council who operate the gates have only recently started monitoring fish and that sort of stuff but you know judging from what turns up in the lake in terms of wildlife it doesn't make a lot of difference as far as I can see. The level of the lake the level is always altered, it's always been up, it's always been down, it's always been you know static for a while so yeah to me that hasn't really massively changed a lot of things. If the lake is too low then you can get a bit of sand blowing out of the bottom the lake, and in fact that's how on the eastern side of the lake those low sand dunes that's probably how they were formed over the millennium. The people who are interested in plant life want the lake high sometimes, sometimes they want it a bit low, there is often conflict there. The people interested in birds sometimes low and sometimes low because of the different birds... and probably if you were a keen boater you would want the lake as full as possible so you wouldn't hit the bottom, so there are a lot of conflicting interests you know. It's now part of a flood management system, as I said before that's what it has to be. And the wildlife and environment around the lake to me is probably better than it was when they first put the system in, I think. That's my thoughts on it, and I can't document that because I haven't done the studies but I think if you dig through some of the studies that have been done you'll find that there certainly hasn't been a huge decline. That it's no worse, and it's probably better.

Austin: What do you know about the barrage gate resource consent?

Interviewee U: I just know that it has to be renewed in 2019 and that it's going to be a shit fire. From what I've heard from some of the groups involved, I think there is going to be a lot of negotiation. And it does bother me a bit because of what we might end up with or without.

Austin: Is there anything you are particularly worried about?

Interviewee U: I wouldn't like to see the operation of the gates and the controlling of the lake levels, I wouldn't like to see those moved greatly. I mean we've been living with the way it is now for quite a long time and it's worked pretty good and that was done for a very good reason and in fact I was involved in a discussion in the management of the Lake Wairarapa and I got a whole booklet on it was produced in 1990 something or other and that's where they established the high and the low levels for the lake, the 10.2 and the 9.8 for the winter levels and the times that they do it and that was done through collaboration through the interested parties around the lake at that time and it appears now we are going to reinvent the wheel and end up with something different perhaps, but to my way of thinking that has worked pretty well and catered to most people. But now unfortunately, I have to be careful what I say but, we got a few zealots involved with tunnel vision about the environment's paramount and this is how it's got to be. Too bad about farmers or other users and farmers and other users will have to try to work around it. Well, I don't quite go along with that. Don't get me wrong I don't want to be an environment degrader, I don't want that looking any worse you know. But I do see it being a major issue and I have heard there are people that want it completely removed and decommissioned.

Austin: Well, one thing that we were told is that there won't be any major changes. Like if anything minor, so they are trying to better get a compromise.

Interviewee U: I hope you're right, but the resource management act when it goes to hearings, public submissions, there's a process that has to be followed and that can lead down a very long pathway and you can end up with a result that is quite detrimental to some parties that have a big stake because we are not a large group in terms of our voting power or what have you want to put it so democracy doesn't always work in that respect. And sometimes I wonder, I have two resource consents I've got to do in the next few months, and the people that hand them out I'm sure they don't read them and fill them out, it's not easy. And the amount of information that is required is quite big and it's basically beyond the laymen to hire a professional person to do it.

Austin: How many people does your farm employ?

Interviewee U: Myself and my wife so we are the owners. And then two others as well. So four people. Then there is a casual person that comes and goes so probably 4.2 people or something like that.

Austin: How big is your farm?

Interviewee U: The actual farm we own ourselves in this area is about 250 hectares but we do actually farm more area around this.

Austin: How could the barrage gates be operated in the future to suit the region's needs?

Interviewee U: One thing I haven't mentioned about the system and the barrage gates is the salt water. So when you talk about water quality, generally people talk about fresh water quality well it's not freshwater a lot of the times its salty and that's when it impacts quite heavily on us when we irrigate because salt water tracks back up the system particularly in times of low flow which is obviously probably when you are going to irrigating because there is not much rain and so that can make quite a big difference so you get salt water species coming up as well with that and that's no issue the actual quality of water is the issue and it has always been like that. It's been part of that system.

Natalie: Do you think you're more affected by the salt water because you're closer to the bottom of the lake?

Interviewee U: Yeah, true we are closer to the sea so bottom lake is not far away and that's open to the sea some of the time. The salt water occurs when the mouth is closed at lake ferry and there is still water coming down the system obviously and salt water is heavier so it sinks then it pushes its way back up the bottom of the channel and it comes in through the barrage gates, through the fish trap, where they open the gates that's where it will come in, and so that's how it will get into the system.

Natalie: I was just wondering because that's something that hasn't come up in discussions so far or at least I haven't heard it.

Interviewee U: Yeah I actually test the water and I know the conditions of when it's going to be like that. And I can actually see it when it's really bad, I can look out here and that all that big

long finger of water will come up and be dark blue and that is salt water coming back up the lake and I know straight away to turn the irrigators off.

Austin: How much do you think you benefit from the Lower Wairarapa Valley Development Scheme?

Interviewee U: Well we wouldn't be farming if it wasn't there. Not in the form that we are.

Austin: Do you believe the benefits from the gates are worth your personal annual investment?

Interviewee U: Oh yeah, yeah.

Austin: Should the funding plan be changed?

Interviewee U: No the only issue I have is the cost of the insurance on it, it's a massive cost to insure the gates and I'm not sure we'd get our bang for our buck we did have to comment on it.

Austin: What overall advantages and disadvantages are there with the current flood prevention scheme?

Interviewee U: Overall the advantages are huge. I mean I suppose if you want to be nitpicky about it the disadvantage of scheme is the cost of the maintenance of it but you know that's being well documented now with most farms because of the scheme I've become well enough established to bear some of that cost. There has been several changes and fine tuning of all that and how to spread the cost and I mean yeah its pretty good I think.

Austin: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee U: So looking forward there is talk of sea level rise and that kind of thing and how that's going to impact the maintenance probably going forward of the gates. I'm not sure what the life span in terms of the actual mechanical side of stuff and how often we can keep repairing and maintaining until something actually has to be done, I'm not sure of that all of that. So obviously that is a disadvantage going forward. The maintenance of the whole system and keeping it so it works effectively from a flood management view, I feel, I'm worried that it will

be severely compromised by environmental issues and I'm not sure if you look at the history of the system when it was put in the first place, that was a major major job, a completely new channel cut, but you know they're environments recovered. Yeah, the thing that concerns me with the environmental side of things it just becomes so difficult to do something that it just won't get done or it will take too long and that when it needs to be we won't have time, you know we are dealing with a very dynamic system you know it's not going to stop raining just because the resource management act is there. So those kind of issues are what bother me about it being able to have the body to look after it, the freedom to be able to maintain in and look after it is best for purpose, they are going to be severely constrained and that's going to impact directly on us.

Austin: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee U: I think it's managed well like now so I don't know if I need to see any change. It's more that there are peripheral things coming in and how that's managed is concerning me like the application that is coming up for operating the gates and what that's going to entail and how that comes to be in terms of what it does to the operation of the gates and the system. The thing that often happens with these things is that you are granted the consent, but then there is a massive list of conditions over here, so on the other hand you have the consent but these are the conditions and sometimes the conditions make the whole thing unworkable so to me that's a whole waste of time and then you go back for an appeal, and it takes longer and it costs more and then the rate payer which we are has to pay more so its gets to be layer after layer after layer and you end up with not what you want. So like I said earlier it's got to be done for flood control and management and that doesn't mean nothing about the environment, it's just got to be top of the shelf.

Austin: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee U: No, well yeah going back the recreational side of things with the activity around the lake. Since I've lived here there has been actually a million more people actually more. There was about 3.2 million in about 1981 82 when I moved here and now there's about 4.6 so

it's not surprising there is a whole lot more activity around the lake, and the free camping type thing that's okay but they make a mess. Yeah they leave their dirty wraps, and their toilet paper, and whatever else just wherever they can so that is not good so you know there is a downside, but that's just what happens with population pressure, you get all the bad stuff comes too. But, overall it's all positive.

D. Interviewee V

Jena: How long have you lived in the Wairarapa Region?

Interviewee V: All my life, which is 68 years.

Jena: Can you describe your farming activities?

Interviewee V: It was basically sheep and beef, but now it's basically dairying and a bit of sheep and beef.

Jena: Are you involved in any organizations?

Interviewee V: No. I am a member of Federated Farmers, but not actively involved.

Jena: How do you value Wairarapa Moana?

Interviewee V: The lake?

Jena: The lake, the river, just the whole water system.

Interviewee V: It has been part of our lives ever since we grew up here. It has been a big part of our lives in many ways with the flooding over the past years and my family has been associated with the lake probably since 1860.

Jena: Associated in what way?

Interviewee V: They've always farmed on the edge of the lake or in areas that are prone to flooding, or have been prone to flooding in the past.

Jena: How do you benefit from the lake?

Interviewee V: I suppose we benefit from being on good land surrounding the lake. That's probably the main benefit. The lake itself is of no financial benefit.

Jena: Can you explain the quality of soil?

Interviewee V: The soil around the lake is built up-some of it- by silt, especially at the top end, the north end of the lake so that's really good land. The land down this end was probably once under the lake or the sea and so its good heavy land that retains moisture well into the summer but can be very wet in the winter.

Jena: Do you think flooding is a major issue in the region?

Interviewee V: It's not the issue that it used to be before the barrage gates went in. Before the barrage gates went in it was a major issue. Like, in the '47 flood, the water went from the foothills on this side to the foothills on the other side and probably for several months whereas now the floods are nowhere near as great as what they used to be and they are gone so quick. It could take a couple of month for the water to come up and then it would take a lot longer for it to go down and it could be up for a lot longer, but the barrage gates worked exceptionally well and they have really transformed the flooding. From a time point of view of the water coming up, it comes up quickly and it goes quickly and also the top lake used to flood- well in the '47 flood which was the biggest flood the water rose to 12 feet above high tide level so virtually all the area out in front here was underwater, but now with the top lake the greatest the lake would get to is say six feet, so consequently you don't need your stop banks as high. It has made a massive difference.

Jena: So, do you think the flooding is well managed?

Interviewee V: It is now. Yes. Like, in the past they couldn't manage it because they were so dependent upon weather conditions, but now that all the water in the Wairarapa is concentrated into the bottom lake, which is about a tenth of the area it used to be. So, the water level comes up very quickly. If it ever gets too high they can always release water back up into the top lake, but the moment the conditions are ideal they can open the lake opening. So it has made a massive difference.

Jena: Do you agree with the management and operation of the barrage gates?

Interviewee V: Yes. I think by in large they do a very good job. The only controversy would probably be the height at which they maintain the top lake during the summer.

Jena: How would you like to see the levels in the top lake change?

Interviewee V: I am quite happy for it to stay the way it is, but in the past before the lake scheme went through the top lake would get a lot lower than what it does now. There would be a lot more sand exposed, up to 2 or 3 km on the eastern side and presumably with the wind in the past that sand would blow to form sand hills which are all down the Kahutara side and now that that's not happening, I imagine that the top lake is silting up a lot faster than it used to even without the Ruamahanga coming into it directly and my family has been associated with the top end of the lake up near the Tauherenikau river mouth. Some say 1860, the accretion up there is quite incredible and it really is filling out into the lake and even in the last few years there's a whole new series of island willows on them a half a km into the lake that wasn't there a few years ago so it really is filling in and changing.

Jena: How are fish important?

Interviewee V: There's always been flounders, perch and tout for as long as I can remember in the lake and I don't know whether there is any difference now to what there has always been. They come and go in numbers as people overfish them and then they give up and the numbers rebuild and then the seasons must have quite a bit to do with it, too, but there is no difference that I know of since the barrage was put in.

Jena: How do you feel about native fish compared to exotic fish?

Interviewee V: I probably know very little about the native fish but I've got no problem with them being there. I am more than happy to provide habitat for them and do whatever is necessary to encourage them and help them.

Jena: How do different bird species impact the region?

Interviewee V: Canada geese have probably been the biggest difference. There never used to be Canada Geese. They've really increased them. I know they have caused damaged to farmers. They don't actually cause any damage to our particular farm for some reason. Swans have always been a problem, but they have always been here and without the lake going up and down as much as it used to, you can understand them looking for habitat outside the actual border of

the lake and there were some big lagoons down here in front- Cattle Island Lagoon and Stump Lagoon, and a couple of years ago they were filled with water again because of extra heavy rains that the flood pumps couldn't keep up with and they were chock-a-blocked with swans again it was quite nice to see them. The other one that has really changed in numbers is the paradise duck or shield duck. They used to be, when I used to duck shoot, you would be lucky if you saw a pair and now they are everywhere. They have really acclimatized to the changes and I think a lot of duck shooters tallies now would be 50-70% shield duck or Canada geese. Whereas we never saw that. The other one that appears to, in my opinion, has adapted quite well is the pukeko. The number of pukeko are probably as good as they've ever been. There have been a few other birds that have come in like the cattle egret. We've had a few of them down here off and on over the years. The odd white Herron sighting now and again. I saw some royal spoonbills the other day which I've never really seen and they were nesting up and around the lake. The only other bird that's come in since I've been here is spire wind clover, but it seems to have disappeared in numbers again.

Jena: Do you know about the Ramsar status?

Interviewee V: The international? Yes, I do. Well I know of it.

Jena: Do you have an opinion on it?

Interviewee V: I've got an open mind. I know a lot of farmers are really concerned that it's only going to bring in another layer of bureaucracy if people want to do things, like draining water into or taking water out of the lake. Draining water into the lake is probably my biggest concern. I'm not irrigating or anything. I understand where they are coming from and I think it would have some advantages especially from a tourism and promotional point of view. The feeling that I've been getting back from the farmers is that they are concern that it's going to add another layer of bureaucracy and like the RMA has brought so much in that they are just not prepared to take the gamble but I am probably neutral on the matter.

Jena: What are you opinions on the wetlands?

Interviewee V: We were instrumental in the having the JK Donald Reserve set up that was named after my father and that where we and the family have been around that area of the lake

since about 1860. So I am all for wetlands. I've created another little dam system down here beside the road, you may have seen when you drove up. Just down here at the bottom of the hill there's some dam and an old gully. That's probably a good thing and if they are at the foot of gullies and things they are probably a good way of straining out nutrients and everything to do with it. I already think, probably the way of the future, for irrigation and that is dams in the hills and the foothills and at the moment I would think that the dams that have been created around the foothills and in the hills would make up for a lot of the wetlands that are gone. To me it's a win win for everybody in that they are providing another wetland storage for the farmers and it's also preventing that excess run off that causes all the damage downstream. Even with the little dam down here since we've had it in, the road up to the cow shed and the shear mocking hasn't flooded since. Before, it used to flood one or twice a year. So it's just that reservoir and I think there's a big potential for that and that sort of thing. And you are putting it in land that is sometimes not as valuable for agriculture as the wetlands around the actual lake.

Jena: Do you think the rest of the farmers know about the benefits of wetlands?

Interviewee V: I'm sure they are. The neighbors I have spoken to and other are very aware. My sister is on the original block at south Featherston and she is doing a lot of work there to reclaim the wetlands and I think most farmers would be more than happy to have the wetlands, provided that it doesn't encroach too much on the land that they spent a lot of money developing. In our case down here its flood pumping it. And even one of the aspects, where our flood pump down and there were a couple of lagoons gone but now there are a big labyrinth sort of speak of drains which are quite big and they do hold water all year whereas the lagoons used to dry out completely in the summer. So in some ways, it might be a different shape, but it has replaced to maybe the almost the same water area as they used to be. And I think with what the regional council has done with surveying fishes and things, there probably quite a bit of potential there for native fish and the other thing which we have started to do, the flood pumps have been set up and I think in some cases they have over-drained the land and that the land used to be really good in the summer and very wet in the winter and now it's probably a lot better in the winter but it has started to dry out in the summer and I think probably those flood pumps for that level could be raised during the summer and that's what we are actually experimenting with down here with the papatai. We have turned the pump off in the summer and let the water come back up to its

natural level because in the past those pump schemes would have had no water access to the lake but it would be possible if this was done that they would actually have access to the lake for parts of the year and whether that would enable fish to come and go, it's a possibility. So I don't think it's something that has been considered or looked at, but we don't have irrigation here, so a lot of them have spent a fortune draining the land and then they have to turn around and irrigate it in the summer so we don't have irrigation so one way perhaps of mitigating the effect of not having irrigation is maintain the water level as a higher level or back to its original level in the summer and just keeping it lower in the winter so all the tunnel drain could move properly.

Jena: What do you mean by original level?

Interviewee V: The original level would be like before the flood scheme and everything went in all the land would be at lake level, if it was open to the lake it would have been lake level. Some of the lagoon probably weren't open to the lake, so that's where they would fill up a bit in the winter, then they would evaporate in the summer and become completely dry because they were never really deep so big surface area and might have only been knee deep sort of speak, so they would evaporate pretty quickly. With the flood pump drains, they're a lot deeper and it would be possible to open them up, most of us have flood gates out to the lake, so we could just open the flood gates and the water could just come and go during the summer period.

Jena: What do you think of the water quality of Lake Wairarapa?

Interviewee V: I think it's as good as it has ever been. It's not that many years ago that I started farming and every cowshed discharged directly into it, a water source, a water supply, or a gully. There weren't as many of them and they were nowhere near as big, but you look at Lake Wairarapa and probably a little extra nutrient in it wouldn't hurt it. It certainly makes things grow and as long as you don't get to the stage that you are getting too much nitrogen or phosphorous and killing the animals and causing the algal blooms, but a lot of that I think it more the stagnant, shallow water is much a cause of that as the nutrient build up.

Jena: Do you think farming has any effect on water quality?

Interviewee V: It must have had some effect compared to the past when the country was all bushed and native. It has to have had some effect. There wasn't the fertilizer and stuff going on

in the past. That's only really come in since 1940 or something like that, I would think. I think the big fertilizer amounts would have started in 1940 and nitrogen has probably only really started in New Zealand in the last thirty years I would think. It has been overseas for a lot longer.

Jena: What way can the negative effects of farming be mitigated?

Interviewee V: I think probably nitrogen is a big question mark. The phosphorous is relatively, from what I gather, easy to trap, but nitrogen would probably be the biggest. We don't actually use it. We actually went organic for three years, but we have reverted back to standard but we are still putting on a real minimum amount of nitrogen.

Jena: I know you mentioned irrigation before, what the pros and cons of irrigation?

Interviewee V: We haven't irrigated, I am probably getting a bit old to look at that sort of thing. But I always thought that with all the water around, it would never be a problem if I wanted to do it. All of a sudden it has gotten to a different situation that there's not the water around where we are located around the lake and everything, so that's changed. I think with the irrigation, everyone you speak to that has got it, it's a hassle, there always break downs, there's a lot of hidden expenses. Power costs are going to continue to go up. I know that there is land that people are dairying on today that without irrigation you would have never considered dairying on it. You would have farmed accordingly. So I can see that it certainly grows the grass. I've got an open mind on it actually. I can see if you've got the water, you can irrigate that certainly makes the grass grow.

Jena: How much do you know about the barrage gates?

Interviewee V: I saw them built. I was probably around for a lot of the planning and I've seen them in use. I can see them from the house here ever since I've been going. Probably the road that went through on top of the barrage gates has really transformed. I used to have to go to Featherston School. There was no access to the other side of the lake. My children were the first to go to Kahutara School because that actually became the closest school when the barrage went through and the access through. Virtually, now, every child goes to Kahutara from the southern end of Western Lake. Just having that road access has made a massive difference to this area.

Jena: How is the lake used for recreational activities?

Interviewee V: It probably hasn't made a great deal of difference to myself although having the barrage gates there and the boat club just on the other side, it has given us access to the Ruamahanga River which would have been on the other side of the lake. We would have had to go all the way up along the other side of the lake and it would have been forty miles away. We and the family are interested in fishing, we all have boats, fishing, kids into water skiing and that sort of stuff. So it has provided a lot of recreation.

Jena: Do you know about the resource consent?

Interviewee V: I know that it is coming up. This is for the barrage gates isn't it?

Jena: Yes

Interviewee V: Yeah, because the flood pumps are also involved. I don't know how it is going to affect the barrage gates, I understood with the flood pumps there would be a grandfather clause put in, in that they were all established long before anyone even thought of the Resource Management Act.

Jena: What do you know about the Ruamahanga cut off?

Interviewee V: Well I know where it is. I've boated off it when it has been in flood. When the road block we have to go another way to town. So yeah, I know quite a bit about it.

Jena: Does it affect you at all?

Interviewee V: It doesn't affect us in that we aren't farming in any of it. The only way it affects us is if the river floods and it closes. Where we are situated we can go Western Lake Road or Martinborough, so it's not a major problem. And it's only ever closed for one or two days perhaps three days.

Jena: What are the overall advantages and disadvantages of the flood protection scheme?

Interviewee V: The major advantage is that because they can manage the levels of the bottom lake so well we don't get the major floods that we use to get. They are able to get the lake

opening open so much quicker and since the barrage gates have been in we have not had a major flood in respect to what we used to have. I mentioned before that in 1947 there was a twelve foot flood. We probably get at least one seven foot flood a year which would cover a lot of ground and a lot of area. I can remember quite a few ten foot floods. They were the biggest ones I could remember, but we had land underwater with those and even roads. So now the bottom lake still comes up but because it's totally banked and they have got the provision of letting the water into the top lake they can control the level so that it doesn't really cause any flooding. The top lake it has gotten up to about six feet in the old term, so it's still relatively minor and it's for a much shorter period of time. The big difference is that they are able to control the flood and to get the lake open.

Jena: Do you think there are any disadvantages?

Interviewee V: I can't really see any disadvantages. I think we probably have the best of all worlds at the moment. The lake level have been able to be controlled within reason, the lake still has its final say but I can't see any disadvantages to anybody. Even with the top lake at times the yachting and fraternity at one stage use to want it kept up to a minimum level in the summer. One of the problems with that was the level they wanted it at, if you get a northwest wind it can raise it at least a meter on the eastern side. The eastern side is very, very low laying and while it was originally in the polder scheme for banking, that part never went ahead. So there are private stop banks, but it puts a lot of pressure on a lot of land on the eastern side and I think that's the other thing that people don't realize. You might set an arbitrary level for the top lake, but you've really got to add on a meter for a decent northwest wind.

Jena: How much would you say you benefit from the scheme?

Interviewee V: Financially, we haven't really benefitted at all. Our land was all banked and pumped before the scheme went through as were most of the farms roundabout. That is one of the reasons why the area known as MacLands. That probably one of the few areas that has really benefitted from the scheme in that it was ridged and filled up. It had no protection before. It was just lagoons and under the water most of the time. So most of the other farms roundabout have all been banked and pumped probably thirty years before the barrage gates went through. It has

made it easier in that we don't have to have those great big floods and have the great big, high stop banks that we used to have.

Jena: Do you contribute to the funding maintenance?

Interviewee V: Yes

Jena: Do you think the amount you pay is worth the benefits you receive?

Interviewee V: Yes it is. We always grizzle and groan about how much we have to pay, but if the existing stop banks weren't maintained we would be grizzling a lot more if we were all under water. When you do go around what is currently considered the high lake and you look at the water level inside and you look at the water level outside the banked areas, there would be a large amount of land flooded if any of those stop banks burst

Jena: Are there any more important issue that we didn't talk about that you think should be addressed in the resource consent renewal?

Interviewee V: No, I think I've said everything. I still get back to that people don't realize what the flooding used to be like before the barrage gates were in because a lot of them weren't around at that stage. A lot of them haven't seen the amount of area that those floods used to cover.

Jena: What part of how the water system is manage would you like to see addressed first? What's the most important issue for you?

Interviewee V: I think the most important part is really to maintain the barrage gates and all the banking systems particularly around the bottom lake, Lake Onoke, so that that level can be raised quickly to open the sand bar and they still have the ability to let water into the top lake from the barrage gates and also at the moment, if the river is too high the spillways operate so in effect, it is an exceptionally good scheme and it is working exceptionally well. There were all the minor tinkerings with the lake levels and other bits and pieces but by in large it has been a very, very successful scheme.

Natalie: So you mentioned how the top lake has issues that the water is too high so the sand and the sediment isn't being blown away like it used to be, but you like the lake level as is or would you rather have them lower so that sediment is removed or could they remove the sediment another way?

Interviewee V: I don't really know, and to a certain extent I am not farming around the lake directly now. I did have land up there but I have sold it. So I don't really have a personal financial interest in it, but I just think it is something that has been overlooked in the overall scheme of things and I think people have got to realize that the top lake is filling up probably faster than it used to. Whether that can be alleviated or not I don't know. I just think it's something that a lot of people have- it's probably something that they have never seen the lake as low as what I've seen it. You could walk across the bottom end here without getting your feet wet at times. With all that sand exposed and you only have to drive down Kahutara and you can see the sand hills and they must have come from the lake. There must have been windblown on sand on the lake. So if you could imagine putting all of that back in the lake, it would fill quite a bit of the lake. Especially because I think the lake at its deepest point is about two meters.

Jena: Is anything else you would like to say that we could pass onto the GWRC?

Interviewee V: No, I think I've had a pretty good say in it.

Jena: Thank you!!

E. Interviewee W

Jena: How long have you lived in Wairarapa Moana?

Interviewee W: All my life, about 8 years [around Greytown]

Jena: Can you describe your farming activities and lifestyle?

Interviewee W: We're intensive finishing, have been through a cropping phase, more so hitting in intensive land finishing.

Jena: Are you involved in any organizations?

Interviewee W: Yeah, [a] business group, yeah that's all.

Jena: How do you value Wairarapa Moana?

Interviewee W: Huge I think it's a big hub, we're attached to it, if you like. Yeah, the water, our stock water, Irrigation water, which we've got a consent for but we don't use yet, but we're wanting to. Just trying to figure out the most efficient way of doing that. The kids swim in the lake. We spend time out there, it is very important to us.

Jena: How specifically do you use the water? You talked about irrigation and recreation...

Interviewee W: and stock water out of the cutoff, which is what we're working on at the moment to try and reattach the old Ruamahanga cutoff back to the lake, to freshen the water up because it's stagnant and not very nice. You would've seen it, you would've smelt it coming up Te Hopai Rd. So we're trying to attach that back up and make it good.

Jena: Can you explain the quality of the soil in the region?

Interviewee W: a lot, definitely what we're farming is fertile sand, so it's sand that can retain a little of fertility. It's good soil for doing what we're doing on it anyway, which is probably why we've chosen the farming type that we're doing.

Jena: Do you think flooding is a major issue in the region?

Interviewee W: yup, it's something that we're very aware of, we've had flooded twice now, in a row. 04 and 06.

Jena: How Badly?

Interviewee W: Fairly bad. We didn't actually own this farm here, we owned the farm next door. 2/3 of the farm filled up fill of water. It's something that we're very aware of that the barrage gates and that protect us from. We've got a little bit of manipulation leading towards protecting us.... We want to put another 4km of stop bank in to protect more of our farm against flooding. But it's all dead water flooding it's not like scouring river flooding, so it's different. Different type of flooding.

Jena: So currently does it still affect you?

Interviewee W: Yes, it protects a percentage of our farm, probably 30% of our farm is not protected from flooding yet. Also if we have a very, very high lake, we've got flood pumps that pump the water off our farm. So if we've got very high lakes, so we've got flood pumps, but we've also got flaps, free flowing flaps, that the water can pass through if there's no water pressure behind it. Raining locally, the flaps will open and let the water in naturally. If it's very, very high, the water can't flow out, so we're relying on pumping, so if we've got very heavy local rain, with pressure from high rivers and high lakes, then flooding is an issue, inside our stop banks as well, but it's not flooding from the lake coming in, its flooding from rain, not being able to get out....

Jena: Do you think flooding has been well managed by the Greater Wellington Regional Council?

Interviewee W: Yes, I think there has been some hiccups, because it was all the technology is probably letting the flood thing down a bit. I'd like to see more technology going. I think that would help, because it's all manually done at the moment, of course, human error. So it would be nice to have technology and human input, and I think it would go better. With the technology we'd also get better and better monitoring on how the river flows and bits and pieces, the flood control team in the council would be able to generate- what do you call it when you generate something that's going to happen downstream. Generate a prediction a model.

Jena: What do you think of the current lake levels?

Interviewee W: They're ok, sometimes get held a little bit too high. We've been losing a lot of land to wave lap around the lake. Definitely our farm used to farm right out into the lake, before the barrage gates. So the lake was held a lot lower from what we can see [layman's] terms, our fences, actually you can see our fence posts go right out into the lake, there's no grass there anymore. So the lake must be held higher than it used to be held, which also causes us to have to pump more. If the lake could be let go, maybe held slightly back in the summer, which I think they do now for irrigation, but in the winter, let it be a little bit lower. I don't know. It's fairly good it would just be nice to be lower at times, probably. The land we're losing to wave lap is a lot now.

Jena: You would want it lower in the summer, you said?

Interviewee W: Maybe initially, and then maybe higher later on. Just backing up a little bit, space for fish, irrigation water I guess.... But in saying that, when they've been painting the gates and they've left them open for summer, the lake actually looks in really good health too. It could go either way, you know. We get big sand storms when the lake's let go very, very low, and it's because there's no grass out there anymore. I'm probably reasonably easy, through the summer period.

Jena: When they paint the gates, does it affect your land at all, the flooding?

Interviewee W: No, when they paint the gates, the lake gets very, very, very low. It scours itself out, which I don't know. The fish probably go naturally with it. When they leave the gates open for long periods, it would take away our irrigation water, if we had irrigation. There's a positive there for the fish, and irrigation. Having the gates, having that control, but maybe controlled at a slightly lower level, or whether- because it could be topped up- it comes with low river flows, we could actually let water back up into the lake, when the mouth's shut. I guess, it's modeling, it's a thing of technology. The more we understood that with the gates there, the more we could model and control things. But for us, we're very, very low lying, like our farm, is only about 11 meters, you know how the mid tide in the sea's 10? Quite a lot of our farms are at 11 meters, and

we get right down to about 10.5 meters. So if we leave our flaps open, our farm would fill up and go down, so we're like Holland, or New Orleans.

Jena: How are the fish important?

Interviewee W: I eat the flounder and everything out of there, so yeah they're important. We've got a non-native fish like carp, tench, English coarse fisherman they fish for these, like goldfish. They're bad. Very bad. They try to bring this England fishing with them to the country and it doesn't work. You know they've choked up – they've wrecked our waterway. Have any of you actually gone to see the backwater, how filthy dirty it is. The Ruamahanga cutoff? It's so green. The only thing that keeps that a little bit ok, is the barefoot water skiers that boat in there. They are a huge positive for us. And without them, we would not be using that water for stock. It runs at about 52 chloroforms, so 52 parts per million of e. coli, and they still swim in it. They reckon your body gets used to it. That's our stock water. That's a big issue, I'm really pushing for that cutoff, we got a consent to join that backwater with the lake, so we're going to use the dirt out of the channel for our stop banks and open the channel back up. But our next push is to get a culvert put underneath the road at the end, and then that would actually become more of a pristine place, and there would be fishing there, the perch would come back. There's no perch or anything like that in there. Even the eeling guys, I haven't heard anything lately but past few years the eel numbers have been getting down. And the bird life, the geese and that. We're pretty hard on keeping a lid on the geese numbers, they all crap and shit in it, yet we intensely farm around it, so I don't want the stigma. Like I believe our farming operation is very sustainable, we're planting trees along our water ways fencing our water ways off, and we farm sheep in the winter, not cattle, so we try to do our best there. But yet we've got all this bird life, not even native to New Zealand, shitting in there, like it's insane. You can have 2,000/ 3,000 birds. Like the water is just black with swans, at times of the year. So we've fenced all that water off now, and planted it so now the birds have actually got somewhere to go so they don't come on our land. We shoot them, we run bangers, there's a real- it's a hard fit there at the moment. The more we can sort that out to freshen the water up the better we'd go.

Jena: That was actually my next question about how do different bird species affect the region?

Interviewee W: Swans and Geese. Hugely. Geese is number one, we've got to get rid of them. ... I've got no problem with recreational numbers, but the numbers they get to is just too much for us. I can have 1,800 birds, work the farm on a moonlit night and take out whole paddocks. They cost me in excess of \$60,000 a year. We've got problems with paradise ducks at the moment, a couple of good shoot ups. You know, shoot a few birds, and then we can put bangers, gas bangers in the paddocks, and then they'll take notice. But if we just put gas bangers, they'll just get used to them pretty quick. Not effective....

Jena: What is your opinion on wetlands in the region or the functionality of wetlands?

Interviewee W: We've got natural wetlands all around us, but we have got an opportunity to start one of our own and I think that would be neat. Like a sediment trap for one of our pumping stations. It's something that we are looking at.

Jena: Do you know anything about the Ramsar status?

Interviewee W: Not enough to comment on it probably... We're not there yet are we? We've not signed them yet? No, but then it would become a world recognized wetland or lake. And I mean I'm a little bit nervous out of that for something, like there's been a few people cleaning drains, because we've all got drains around the lakes. People who've cleaned the drains have got in a lot of trouble for it. So once it went to Ramsar status, whether you might get [a real big book] thrown at you, and that makes us nervous. You don't really want to end up in court cases over cleaning a drain. We farm because we enjoy nature and the land, otherwise we'd sit in an office all day. ...

Jena: What is your opinion on irrigation?

Interviewee W: ...the importance of irrigation. I don't think it's for every part of our farm. We have heavy enough soils that need to naturally dry out and do their thing, but I think, definitely for some of our sandier soils, bits and pieces of irrigation would be a huge positive for us, and that it would also help us create organic matter, which would then give us better filtering of nutrients....

Jena: What is the state of the water quality in Wairarapa Moana?

Interviewee W: ... From a visual, I've never tested it. But from a visual end, just kids swimming in and us swimming in it. It's not drinking water though it's good. I think the wind chop, it's always got a bit of water movement, and you get a nor'western wind and it can move the water a hell of a lot, like it can push the water in on our side. So there's enough movement in there and wetlands around it to help it along. Don't have any problems with the water quality there, it's more in the backwater.

Jena: Do you think farming has an effect on water quality?

Interviewee W: Definitely some farming operations, like I'd like to think that we are heading in the direction of being neutral or sustainable. There's plantings, but we can only do what the information we get. Maybe there's something else in the future that we might be able to do to be better, but science hasn't told us that yet, or whatever. Our big one is that we don't run cattle on the heavy country in the winter, because they're going to pug the paddock, then we're going to get rain, and that sediment's going to end up in the drain. I think from what we're learning is, is everyone's been focused on the nutrients, which really we should actually keep it simple and focus on the sediment. And if we're focusing on the sediment, that's easy for a farmer to do, understand, and then if the sediment doesn't go into the drain, then the nutrients don't go into the drain. They started in the wrong direction, made it too complicated and people didn't do anything about it. But in the last farming for futures, seminar I went to, was just get farmers to focus on the sediment and then everything else would come naturally...

Jena: How is the lake used recreationally?

Interviewee W: Swimming, we jet ski in it. Shooting, flounder, fishing. I mean Featherston's yachts yeah, bits and pieces. We've never yachted down this way. That's about it.

Jena: How much do you know about the Barrage Gates?

Interviewee W: Well I know they were put in in the 70's, my knowledge is limited and it probably shouldn't be. I should rev my understanding up a little bit better. But I know, I understand that they're there to force the Wairarapa Valley water out to sea. Otherwise, we'd be at risk for flooding, and also if we get big rain events that our flood prevention systems can't

handle. We can track that water through the spillways, can all get into the lake and take the pressure off blowing up our infrastructure, our flood protection infrastructure.

Jena: What do you think are the advantages and disadvantages of the Barrage gates?

Interviewee W: I think that the advantages are having the control bit. ... There is a disadvantage there's a conflict of interest over them because of the fish and the farmers or the water and the farmers, and I think we're all conservationists at heart. And I think that the fish thing, they find their own way, like you know the gates are always open, it's not like trapping fish to die on one side or trapping- there's always water leaking under the gates like you'd never ever stop it, I think there's no- the only real disadvantages are if they're operated incorrectly, you know for. Without being a selfish farmer, there's all sort of if they're operated incorrectly then a lot more power on pumping water out. We've got the ability of free flow. Whereas if the lake was kept a certain level a certain time of year, for certain rain events, we wouldn't have to spend all of that money on power. So there's positives there and negatives. ...

Jena: What do you think would be a fair compromise between letting the fish migrate and having the flood control?

Interviewee W: the trouble is, if you took the gates away, at times of year there would be no water- very little water for the fish to come to. Like it would be so shallow, and I've seen the lake really shallow, just a ripple of water coming past the farm and what had happened is, it was during the painting of the gates. You know how you get sand, and you get water running across sand, and it ledges and it starts caving in? What do you call that? Erosion. Say the lake bed level's there, the river bed level's there, but the gates are in here, but this is kilometers apart. So they're painting the gates for 2 months or, a month or whatever it is. So we're sitting there watching the water go over a waterfall, so it's very shallow going over a big wave of water, and then that's just working its way back up the lake in increments. So I think if there was no gates there would be some massive, massive sediment issues. The fish, that's no good for the fish either, and the trouble is the lake's continuously dirty. Ragged up because of the wind ... I think – the gates have become such a stable part of everything, I think the environment has settled to what it is, I think. There would be some big changes if the gates came out and for better or worse, I don't know, because from what I understand the ground here rose in the last big

earthquake that we had. How far was that? 700 mm? It was quite a bit. The big, big one we had I think was about 4 meters. No, this was in 1800's. So the lake has been through some massive changes, there anyway. The trouble is we don't know what the changes from there on are going to be, whether the gates are there or not. I think at the moment we're operating a literally controlled environment. We've got the needability to be able to do something with it. I think the fish here, there's no problem with fish in the lake, there's heaps of [Maua] and heaps of flounder, and they're good eating. It all seems to be working pretty sweet.

Jena: How much do you know about the barrage gates resource consent that expires in 2019?

Interviewee W: Very little. I think if they took the gates away, it could play with our farm value, and that is probably a concern to- and it could potentially put people at risk because everything's so controlled at the moment, if you had no control, we would be farming under a lot of water, at times, more often. So there's a huge human risk to that to, you know, there's no warnings. It's not the same as being in a controlled environment.

Jena: How does the Cutoff affect you?

Interviewee W: It affects us because the water quality isn't good enough, it affects us with the smell. I think it could be a really neat recreational area if it was better.

Jena: How could they improve on that?

Interviewee W: Connecting it right through the river. But that, to be fair, if you wanted to go another level, or another way of thinking, that could be the fish passage, which would be better for all, I reckon. Coming from the river through the backwater into the lake, through that passage, and that would create more of a flow of water, because you've got the flow of water with the gates, and if this was a continuous backwards and forwards flow, the wind off the lake, because the water will move, it can push up here half a meter, the gates with the wind. [If the nor'western dump in the lake.] Sometimes we can be sitting here, no wind, and there will be white spray coming off the lake, it's like it bounces over the top of us. Other times it can be windy here, and the lake there's no wind. Just the different wind speeds coming off the hills and where it lands. Definitely if we can get a culvert, it could potentially be controlled but a fish passage under the road into the backwater of the lake would just increase the water quality of the

backwater. It would flush out all that bird shit that builds up. You now, if we could dilute that, I don't know if the fish eat bird shit or not. Something, there'd be some way some more investigation needs to go into how we deal with this area with the birds polluting like it's just too intense.

Jena: What's the most important issue that you want to be addressed for the resource consent?

Interviewee W: Water quality in the backwater.

Jena: How much do you benefit and do you think the benefit from the flood protection scheme specifically the barrage gates?

Interviewee W: ... I think we benefit, well yeah.

Jena: Do you think your benefit is worth the rates that you pay?

Interviewee W: That's a complicated question because of [forming] of farm stop banks are all private stop banks put in and paid for by this farming business and other stop banks in other areas were paid for by the scheme. But if you're talking about just the gates in themselves then I think- if you took the gates away now, there would be bigger cost to us.

F. Interviewee X

Interviewee X: ...We had 200 [animals] marooned on a high bit. Had to come off ten at a time. And we had another southerly storm, so that wasn't the greatest. We lost 2 sheep, I think, we were lucky. There were big stock losses in that. That's probably the biggest flood in recorded memory in 97. There's been other quite big ones since. Since the Barrage gates went in, it has been alleviated quite a bit.

Jeff: Can you describe your farming activities and lifestyle?

Interviewee X: We have a 300 hectare property, which is like a half moon boundary with Lake Wairarapa. It's just north of the barrage gates, missed us by about 500 meters or something. I've lived there all my life and I'm 76. Had a long association with the lake. It goes back further than that because my father was initially on the River board, which was responsible for opening the lake, you've probably heard about that, and then that was taken over by the catchment board, and he was also involved with that. And then my husband has been on the committee with Ian Gunn, advisory committee, and well as living there, I've had a fair dose of the lake, really. It was a playground when I was a kid.

Jeff: Are you or were you involved in any organizations?

Interviewee X: No.

Jeff: Are you involved with politics?

Interviewee X: No, not really, no.

Jeff: What do you value most about Wairarapa Moana?

Interviewee X: I think the wide open spaces. The lake- it's a really big lake and its got a great aesthetic value and I think it's pretty important to the district... I wouldn't like to see it not be, it's great. That was a view from my kitchen window, that's what I used to look at, and we could look right out the lake to the back of Masterton. It's quite special. It has- the lake has lots of moods. It's never the same two days in a row. I think about 3 times a year, it might be like a mirror, that doesn't very often happen, and usually a bit of breeze, ruffles it up. And the fact that

it's quite shallow mostly, so the wind stirs it up and makes it muddy looking. I've heard it said that since the Barrage Gates went in, that's upset the lake. Made it dirtier than it was, but from my point of view, I would dispute that. I don't think it's any dirtier than it's ever been really. A lot of it depends on the weather conditions.

Jeff: How does Wairarapa Moana provide for your needs?

Interviewee X: Well [I] help with erosion protection around the edge of the lake. We pay rates which covers that, hopefully, some of that. That's about it all it does at this stage. Our property and two others is pumped with a flood pump, and the Regional Council used to manage that for us, and rated the land owners accordingly, but the costs got a bit high, so we administer that ourselves now. Actually need a bookkeeper for that so, and it's only a matter of paying for your bills, mostly the power bill. Its flood protection that the regional council has provided, has been considerable, and they've helped with banking and with –protection around the edge of the lake. Planting and that sort of thing, assistance with that. Possibly you should talk to my son, because that's his hobby horse. It's because our property has 30/40 acres permanently in the lake through erosion, there's a wee bit of liquefaction of one sort, in one corner, but most of it's in the lake. So we pay rates on that, it's not really a great deal of use to us. He's very keen on and he's working with some of the guys on the district council, in protecting the lake edge and doing all the planting, at the moment. My son ...

Jeff: What's the most important aspect of Wairarapa Moana? Why?

Interviewee X: I think the aesthetic value and the wildlife. There's not that many, there's lots of nice lakes on the South Island, the North Island hasn't got many and that's pretty special. It's really interesting because, you've probably been told this, but way back it was an arm of the sea. We've dug down on our property for different things and come across fossilized seems of puppy shells, and our property, part of it, was an old sea beach. You can see the sea beach formation. And the property, it's low-lying flats, but then there's a terrace, which was obviously an island hundreds of years ago. It has unusual characteristics in that respect.

Jeff: Can you explain the quality of soil?

Interviewee X: Not really. My son could do that better for you.

Jeff: What do you know about flooding in Lake Wairarapa?

Interviewee X: A lot, it's ruled my life for years, until the barrage when in, and then it's not the same. There's not the same worry, although in saying that, we have a flood pump, and without that the lake flats would, instead of grazing sheep and cattle, growing crops would be feeding just ducks most of the time, rushes, rubbish, totally unproductive.

Jeff: Do you think flooding is a major issue in the region?

Interviewee X: yeah I think it is, probably. Perhaps not as much as it used to be. It is more controlled, and they get good flood warnings. It all helps. Where it gets to be a problem, when they – the lake mouth's closed and a lot of water in the rivers, and that's been happening since.... it's nature, there's not an awful lot they can do about that. If they have the conditions right to open the lake to let it go. Prior to the barrage gates going in, it was quite tidal. That made it different in a way because they – it would change the level a bit, between high tide and low tide. The other thing is, in a strong nor western that puts the level up quite a bit, on the southern end, or if it's a Southerly, it puts it up at the northern end. It changes the level quite considerably. The strong winds. Because the lake is like a middle of a wind tunnel: the Rimutakas one side and the Aorangi the other, and wind fairly [dotes] up there. We always say there's nothing between us and Palliser Bay.

Jeff: Do you think flooding is well-managed?

Interviewee X: Yes, I do. Yes. As well as it can be.

Jeff: Do you agree with current flood management or should it be changed?

Interviewee X: I probably can't answer that very accurately because I'm not living there now. And it's the ones farming on the edge, others- I don't think they're ever going to please everybody because, some want it up a bit and some want it down a bit. They just have to try and sort the happy medium. It's not... Because if it's quite low on the Eastern side there's a lot of sand blow, which blows onto the paddocks, and it's not that good. If it's too high, there's a bit of flooding and it causes, quite a bit of erosion. It's hard to please everyone. You've got to please the duck shooters too, at duck shooting times.

Jeff: What do you think of the current lake water levels?

Interviewee X: I think they're probably the best they can be here. As I say in the light of trying to please everyone.

Jeff: Would you like to see them change? The water levels?

Interviewee X: No, I don't think so, no. As far as I'm concerned, no. Where it's a worry, if it's a high lake and there's heavy rain and the water's got to get out. For instance like flood pump, has to pump out into the lake, and it's pumping against a much bigger head of water, if the lakes high. If it's low, then it zooms out. The pump has to work much harder if it's a high lake. You can't always organize that it's a bit weather dependent.

Jeff: How are the native fish important?

Interviewee X: It's always been- floundering, but I haven't partaken, not for ages not since we were kids. We used to always drag our net, but usually there were too many snakes, so it wasn't the greatest place. We used to dig for puppies a bit – They're actually not – we call them puppies but they've got another name. It's a shellfish that's indigenous to the lake. Not paua no, but these have got another name, and I think they're indigenous to the Wairarapa Lake. I used to spend a lot of time as a kid, playing on the edge of the lake, so I wouldn't know now. If we get into birds, that's more of a hot topic. Because the geese and the swans, they're dreadful. They complain about the stock fowling the lake, but I'd think the geese and the swans would be far greater, because you see them come onto the pastor and the swans and the geese- they come on in droves and it's always a nice fresh pastor, just about ready to put some lambs or something. And what they don't gobble up, they fowl, droppings everywhere. They're disgusting. They're not natives either. I would like to see them eradicated, I really would. That would be my biggest.

Jeff: Are there any other bird species that impact the region?

Interviewee X: No, not really, they're the two main ones. There's always been ducks, but they don't do any damage. The swans, apart from eating grass and fowling, they do a lot of erosion damage, because where they waddle on, they dig out the bank and then the waves come in. They're a real problem, the swans...I don't like eating them.

Jeff: Is there anything else you'd like to say about the native and exotic fish?

Interviewee X: No, not really. The creeks at home used to be all right for whitebaiting, but I think since the barrage has gone in, that doesn't happen anymore. I'm not a whitebaiter so, I don't use ... I can't complain, really. I don't really like flounder, so I'm not really the right person to ask that.

Jeff: What is the state of the water quality in Lake Wairarapa?

Interviewee X: I don't think it's very different to what it's ever been, from my observations. It'll change depending on if it's a flood or, it's seasonal, overall I don't think it's very different. Maybe, I know there's a lot more dairy cows, around it. Before the dairy cows, there used to be a lot of beef cows. I don't think- to my observations there's been a lot of change.

Jeff: What are your views on irrigation in the region?

Interviewee X: I'm not against it. It's helped with production...

Jeff: What is your opinion on the current status of the wetlands?

Interviewee X: I don't know if we need any more than we've got, I think we have to protect what we've got. If we didn't have so many swans and geese, we wouldn't need such an area for wetlands, if it was just ducks and storks and native birds.

Jeff: Would you like to see anything change with the wetlands?

Interviewee X: No, if it stays... ok by me.

Jena: Do you know about the Ramsar status?

Interviewee X: No, what's that?

Jena: It's a status given to wetlands and its internationally recognized, and because of this status, I think, the Greater Wellington Regional Council, will get funds to put into the wetlands in order to maintain them and protect them, and apparently there's some group of people who are interested in visiting as many Ramsar status wetlands sites as they can. As of right now,

Wairarapa Moana qualifies for 7 out of the 9 qualifications, and I think you only need one of them... There's some mixed feelings in the community about how they feel about it.

Interviewee X: How they should be managed as much or whether?

Jena: I think more the concern is will they put on more regulations and stuff like that.

Interviewee X: Well I think wetlands should be available for people to look at, but it needs to be will managed. You don't want people running around amongst it... Sometimes these things get abused with everyone trekking in and leaving their litter... It definitely needs to be policed, I think.

Jeff: How is the area important for recreational activities?

Interviewee X: There's yachting at the top end and jet boats here and there. I think it's good. There' been a lot of fatalities, on the lake, because it's taken too cheaply. I mean basically it's very shallow lake, it's the wind chill factor that has killed people mostly, and there has been some bad fatalities... when you grow up in the area you know, how rough it can get. ...It's a howling gale it's like- it looks like the ocean, there's big waves and it looks quite odd.

Jeff: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee X: Yes, I'm – a cousin of mine looks after the JK Donald reserve, she does a lot of work there, there's duck's unlimited. Apart from the regional council, I think that's all that I can think of.

Jeff: Have the conservation efforts changed over the time you've been here?

Interviewee X: Yeah they have. People have become more aware of the need for them I think. The JK Donald reserve has been formed in my lifetime, and Ducks unlimited have been formed in my lifetime. Probably, it was more erosion protection than anything else, and pest control, have been the main things up until more recent times. When I think back earlier, rabbits, flood protection, building up banks, not a lot in those days.

Jeff: How important to you is conservation?

Interviewee X: Quite important. I'd like to see it maintained like it is. The aesthetic value- it's a great asset to our district, I feel. So we need to look after the shoreline.

Jeff: Do you think that there needs to be more anti-pollution measures to be taken? Please specify.

Interviewee X: That'd be a hard one to answer, I mean I don't know how well the – what the tests are coming up with, and I guess they are testing the water. I know years ago, the Wellington city council looked at a plan for pumping the water over, for water for the city, and they used to come and test the water on our place, and then drive back up to Featherston, then drive right back down the other virtually opposite of where the gates are now. Then test it again. They were quite oblivious to the fact that it was the same little patch of water, on one side and then the other. I guess it's more – better methods employed now for testing the quality. I haven't had access to those or know anything about it much.

Jeff: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee X: Quite a lot really. My father was on the catchment board when it was instigated. I've been an observer, probably all my life.

Jeff: What did you observe?

Interviewee X: The flood protection part from anything else, yeah. Just erosion control, looking after the rivers, looking after the wetlands and the lake edge, slips in the hill country. A lot of plantings been done, and that's –I'm all for that. I don't want all the country slotting out into the sea.

Jeff: What do you know about the Barrage Gates?

Interviewee X: I watched them being built and installed; I know they're controlled electronically from Masterton, That's about all really. Made a big difference to Western Lake, we had access from the other side of the lake. My children went to Kahutara school, prior to the gates being put in they would have had to go to Featherston, which was 19 miles, which was a pretty long hike.

Jeff: So were you on the western side?

Interviewee X: The western side, yeah. Well south western end. But our access was on the western side. We had no access to the eastern side, without going back up into Featherston or the only other thing, is if it was a closed lake, you could go along the spit.

Jeff: So if it was closed you could drive across?

Interviewee X: Yeah you could, but it's sandy so not an ordinary vehicle. People used to ride on horseback too. In the early days, they always went on horseback to go open the lake, carrying their shovels. The first time they did it mechanically was with a D-2 caterpillar. Part of that was all pack and shovels, all the local farmers used to make it a thing to say the lake was ready to open, so they'd all toodle down and get shoveling, and hopefully get it open before the next Southerly came in. My father was involved all his life. He grew up in Featherston, at the northern end of the lake, and then moved down to where we are now. He was involved in shovel exercises as was his father before him- it's progressed now where it's all done mechanically. It used to be a lot of hard labor. Sometimes they'd get all the way down there and a storm would come in, and they'd have to come back home again.

Jena: What do you know about the barrage gate resource consent?

Interviewee X: ... From my point of view the resource consent is a pain, because it seems to take so long it seems controlled by all the little Hitlers that make you jump through all the little hoops. I think it could be streamlined...

Jena: If there was one thing you would like to see going forward about the operation of the gates, what would it be?

Interviewee X: I can't personally think of anything, no.... I think it's pleasing everyone, and you'll never do that. So, they've just got to strike a level that's going to keep everyone reasonably happy. Everyone's got different needs, that's the thing.

Jena: How much do you know about the Ruamahanga cutoff?

Interviewee X: Well I saw it happen, when they built it.

Jena: What are your thoughts on the cutoff?

Interviewee X: Well it's improved the flood protection immensely. It's been a great asset to the district I would say.

Jena: If you could have anything changed about the cutoff, would you keep it the way it is?

Interviewee X: Yes, I can't see anything wrong with it. I think it's been well done.

Jena: How much do you think you benefit or did benefit from the Lower Wairarapa Valley Development Scheme?

Interviewee X: A lot, flood protection, help with erosion control and banking, access. It's made a big difference. Schooling, my kids.

Jena: Did you contribute to the annual maintenance rate to the GWRC?

Interviewee X: Yeah, we've been rated.

Jena: Do you believe the benefits from the gates are worth your personal annual investment?

Interviewee X: Yeah, I think so. It's made a huge difference to the district really.

Jena: Do you think farming has any affect on water quality?

Interviewee X: No, I don't think so. It doesn't seem to have made a lot of difference. Now, all of the drains have to be fenced, stock kept out of them. Maybe the density of stock is greater, so that has to be perhaps- I think they can go overboard- It's impossible to fence rivers all the time, and after all there's deer and goats, and they go into it. Sheep and Cattle aren't an awful lot different. It's just not feasible to fence all of the waterways leading into the lake, I don't think. It's a good thing to fence as much as possible, but I think you can go overboard. You've got to be reasonable about these things.

Jena: What do you think the overall advantages/ disadvantages are with the Lower Wairarapa Valley Development Scheme?

Interviewee X: I think protecting the area from floods would be one of the biggest.

Jena: Do you think that there are any disadvantages?

Interviewee X: No

Jena: Overall, besides the topics we've discussed, so you have any other issues with the way the gates or the scheme in general is operated?

Interviewee X: No, I don't have any issues. The resource is there to help the landowners, and the landowners have got to make use of them. I think that's probably important. Some are probably a bit died on the wall and don't like change, but it's a resource we need to look after. I think the regional council certainly assists in that. They've just got to get on the right side of all the landowners. Some of them are obviously easier to deal with than others.

Jena: If there was one thing you would like to see going forward, what would it be?

Interviewee X: From a personal point of view, more erosion control on our property. That's our biggest bug. We're at the very bottom end of the lake, so if it's a nor'east wind then the waves belt into- and it's all windblown sand, clay, so it just falls away. It's really hard. Next things, fences disappear into the lake. We've got 30/40 acres permanently in the lakebed. That's always been a bone of contention. My father used to say "we pay rabbit for the rates, and the rabbits would need snorkels"

Jena: What do you think of the fish passage?

Interviewee X: I think that's good yeah.

Jena: Do you think it could be improved or it's fine the way it is?

Interviewee X: I think as far as I'm concerned, it's fine the way it is, but I'm not really a fisherman so.

G. Interviewee Y

Interviewee Y: ... and they got a fine for digging a straight out into that because they disturbed some native muscles, whatever they are those little musky things. Even though you had a DOC permit do dig the drain, you didn't have a regional council permit they control the- it's really funny because the water's controlled by DOC, the lake beds Regional Council would say, there gets a lot of confusion there. Then fish and Game wanted the gates opened for three hours a day, so now there's no water in the lake, so they all just frizzled up and died anyway, killed the whole lot. Ask yourself, who's- There's a fish track there for fish to go up anyways, but that wasn't good enough for some to get in and out of the lake. **sarcasm**

Interviewee Y: So the management of the scheme has evolved over the years, being from a catchment board, which had farmer members on it to Regional Council who, pretty much are tosses, or they don't always have the expertise to know what they're doing, I don't think. And they sort of forget that it was the farmers here, who paid for this scheme, for them to administer. As it happens, in a lot of government departments you get [a lot of in prior building happens.] They like to wave their big stick around, 90% of the time it works well, the actual design and the build of the scheme, and the ongoing maintenance of it has been good, and its been effective. The ecological effect it has on the lake, I wouldn't really know, but it's been there since about 1964/1965 I think. From what I've seen, not much has really changed in the lake, that wouldn't have changed anyways. ... In those days there were never any environmental impact studies done anything so now the effect it's had on anything would be very, very hard to quantify.

Natalie: How long have you lived in the Wairarapa Region?

Interviewee Y: All my life... I've been here since 1981.

Natalie: Can you describe your farming activities and lifestyle?

Interviewee Y: At the moment, I've leased the farm for dairy support. I've been told, probably a year and a half ago, that mixed sheep and beef and a small amount of arbor, mainly sea pees, wheat and barley, stuff like that. Now it's basically dairy support.

Natalie: Are you involved in any organizations?

Interviewee Y: No

Natalie: Are you involved with politics? If so, what do you do?

Interviewee Y: ...No

Natalie: What do you value most about Wairarapa Moana and Why?

Interviewee Y: It's not a lot of a lake that you do a lot of recreation in, because it's shallow, muddy, it's actually quite dangerous in there, a lot of people get drowned in it. Even though it's only this deep, it's really windy and rough, it's a nightmare in there. Probably the birdlife is probably its biggest feature. It's always been a great area for duck shooting or even to if you like watching birds, we get a few bitten in there, and some other rarer stuff float around. Probably the bird life...

Natalie: How does Wairarapa Moana provide for your needs?

Interviewee Y: Well it's a good storage pond, when the river's full of water, so a huge buffer for the flood scheme... We don't irrigate here, but it could be a source of water for irrigation. Down the track, if climate change keep getting dryer and dryer. Normally we get hampered here by too much water, rather than not enough. I'm a keen water fowler and it provides excellent sport for that. I know that's not very PC, but I like shooting ducks.

Natalie: What's the most important aspect of Wairarapa Moana? Why?

Interviewee Y: Well I think it's got quite a lot of ecological merit, so it's a great pond for waterfowl. It has a huge impact on the flood scheme and without the capacity that it has in there to soak up excess floodwater; it would be under water a lot. Probably, I think it's an important part of the landscape too, because it's always there, you don't really think about it, but if it was gone, you'd probably miss it. It's an important part of the identity of the area. This side is known as Eastern Lake and the other side is known as Western Lake, without a lake, you're nobody....

Natalie: Can you explain the quality of soil?

Interviewee Y: It is like anything here, we go from windblown fine sand ridges to river silt to blue clay, but it's definitely very fertile country, I think we grow around, down here, we grow right around 20,000 kg of dry matter a year. Whereas if you go out to Eastern hill country you're doing 7,000. So that's the difference. We're a bit wetter in the summers too, basically on this flood plain with river silt, out there was the old river before it was diverted. A lot of the farms probably got a couple meters of river silt.

Natalie: Do you think flooding is a major issue in the region?

Interviewee Y: Yeah, a lot of this area, until the flood scheme, was very underdeveloped. ... We used to run a few cattle, or bits of it, a lot of it was not really utilized. You couldn't rally cultivate it or crop it or farm. The old farms that were here, displaced, there's a flax farm back in those days, used to have flax along the river bank... They banked on losing all of their livestock, once every 10 years. I think it was 1943, 1944 there was a big flood around that area... an old chap on ___ before he died, one of his first jobs when he started there when he was 18 or 19 was to go around with horses and try picking up dead sheep, and he said about 20,000 of them, or 10,000, something like that. That was basically wiped out.

Natalie: Does flooding personally affect you on your farm?

Interviewee Y: Well since the scheme, it doesn't really flood here, we've had one event where it came over some old stop or flood banks that were maintained because we never needed to, but that was a perfect storm of things, they had the barrage gates out and sandblasting them in February, when it never rains, we had a tropical cyclone, it stalled, a southerly and it just filled the valley with water. The lake probably got 1.5 to 2 meters deeper than it ever had in recorded history. We got flooded then, once in 30 years, and that was mainly because they couldn't shut the gates, to stop it backing up into the lake. Since then, we get surface flooding from heavy rain, but that's a couple of days and then it's gone into the drains, into the pumped canal, and then it's gone. We're low lying, we've got to pump water, but there's no natural flow for draining.

Natalie: Is flooding well-managed in your opinion?

Interviewee Y: yeah it is yeah. Some of the biggest floods we've had in the history, the scheme, it's coped with it to its design specs... as far as I know, we didn't get any water so- that was good, yeah.

Natalie: Is there anything with the current flood management that you would like to see changed?

Interviewee Y: Probably the political side of it. Where it's gone, the control side of it. The farmer's paid for this scheme, and it was for us. To be fair you've got – we all realize you've got to work with the environmental parameters, but the control over who opens and shuts the gates is getting pretty blurred now. The scheme itself is fine, the management of it, is getting a bit questionable, and how they charge for it. Seems we have a lot of people driving around and doing nothing, we still get the bills. That's a government political thing, it happens everywhere...

Natalie: What do you think of the current lake water levels?

Interviewee Y: At the moment it's pretty much at a normal average for this time of the year. I would think. Last year it got really, really low, a lot lower than we normally see it, but this year if they're keeping the gates shut off, I'm not sure who's even controlling it now. In general it's pretty much normal for this time of the year.

Jena: Do you like them, would you prefer them at that level?

Interviewee Y: I think you would need to keep it at a certain level. A lot of people use it for stock water, and myself, so it gets dry, you know stock water, [when I get a bowl], but it won't supply enough for the cows, not in the summer. It needs to be kept up, and if the mouth's blocked and you get a summer storm, you need – a reasonable amount of water. That was the whole reason of having the barrage gates there to control the level of the lake. It seems to me, you've got to keep some water in there. Last year, it got that dry. We could drive out to the lake for probably 5 km, it's really flat, it doesn't normally get like that.

Natalie: How are the fish important?

Interviewee Y: We do like a bit of flounder to be fair, for recreational fishing, it's a good lake for flounder. I don't eat eels but I like the thought of them being there. They're a part of our landscape, I'd like to see them flourish in there. That's nothing too, If you let all of the water out of the lake, where are the fish going to swim.

Natalie: How do you feel about the native and exotic fish?

Interviewee Y: The exotic fish, the lakes too shallow for trout, they never really hang in there, they'll hang in the river. Then we do get sometimes, bloody English people chucking of course fish in there, tench, they're bad news. Exotic fish need to go.

Natalie: How do different bird species impact the region?

Interviewee Y: The Canada geese were a little bit of a sticky problem for a while. I have two mindsets, I love hunting them, but they breed so quickly and I'm pretty sure they take over all of the good nesting sites and they're devastating to farmers on the lake edge, myself included. They need to be probably severely managed. The rest of the birds were here before me, so I live with them. You adjust to them, but Canada geese, they're difficult to control. They'll- mallards and them, if you go out and fire a couple of shots in your pea paddock, you aren't going to stay until its dark, and then they go to sleep, Canadas don't, they'll graze all night. You won't see them during the day, but they'll come at night and graze. It's a 24 hour a day job, and they're so much bigger and numerous. They do a lot of damage but since they were deregistered as a game bird, we have no trouble with them. There's some guys around the lake they go out by helicopter just about every year and go around and shoot them... they're being managed at the moment. The other birds, I'd like to see more mallards, they don't seem to be thriving at the moment. We had a population of 5,000 geese on the lake that never used to be there, 1 goose eats more than 4 or 6 ducks probably.

Natalie: What is the state of the water quality in Lake Wairarapa?

Interviewee Y: It's much the same it's always been it's just a shallow muddy lake, it won't ever been a pristine, mirror lake or anything. It's shallow, when the wind blows, it stirs up and it's muddy. I don't think it's changed since I've been here to be fair.

Natalie: Do you think farming has an effect on the water quality of Wairarapa Moana?

Interviewee Y: Inevitably it probably does, most of the guys around here are pretty good. A lot of the – everyone's fencing drains and trying to do the right thing. There's probably an odd person who doesn't but different- all the major rivers now, don't have stock in them. Most of the dairy farms around here are relatively new, so they started off on the right foot if you know what I mean, not playing catch up. They've had buffer areas since day one, and they would have had that through the years.

Natalie: You've shared your views on irrigation before, but is there anything you'd like to say specifically?

Interviewee Y: ... It's a double edged sword because most of the people who are irrigating now are irrigating out of artesian bores, which is great, there's plenty of water under there, but all of our- people would just pull water out of the ground, turn the irrigator on and within 20 minutes you've got, the bores gone dry. It's hard because there's a lot of water under the ground but not a lot. I'd probably like to see more people use lake water that gets replenished again because underground aquifers... it takes a long time before water gets back down to where they've sucked it out. But river water only going out to sea anyways...

Natalie: What is your opinion on the current status of the wetlands?

Interviewee Y: They're probably only improved, the decline's probably been halted if you know what I mean. ...Around the edge of the lake, you'll see they're reinstating all of the wetlands and replanting them. You're never going to have back the big lagoons that would have been here pre the flood scheme because they filled them all in when they dredged the diversion. You're never going to have that type of thing, but the edge of the lake, particularly the margins of the lake now, are being restored, and probably the development of it has been halted... It's being turned back to how it should have been. Probably a little way off from being perfect, but it's in the right direction, I feel.

Natalie: Is there anything you'd like to see change about the current efforts?

Interviewee Y: Pretty much, backwater here, I haven't done all of the way down. The other side's all been all of the exotic stuff's been taken out and it's been fenced and planted with natives, and in another 10 years it'll look really, really good. They started on this side, and then ran out of money as usual. Everyone wants it to be restored, but no one wants to pay for it. That age old dilemma. Definitely the trend towards lake has been halted or even reversed in a lot of cases.

Natalie: What is your opinion on the Ramsar status? Do you know about that?

Interviewee Y: No

Jena: It's a status given to wetlands, they're internationally recognized, and then you can get funding from the government for the wetlands, and apparently there's some people whose goal is to visit as many Ramsar locations as possible.

Austin: It's been kind of a controversial issue between DOC and some of the farmers because they're not really sure what's going to happen.

Interviewee Y: Not specifically, but I know roughly what you're talking about. A lot of bits are protects as such, call it an ecologically important site. Sorry, there's a bit of a gap there on that one.... A lot of farmers have developed their own wetlands and have come to it themselves, they gone to DOC if they sell the farm it could all get drained again undone the work... We like a good muddy puddle as much as anybody. If it's in the right place.

Natalie: How is the area important for recreational activities?

Interviewee Y: I'd say it's not a lake you'd go water skiing on or swimming in or anything like that. For waterfowl and bird watchers it's a great asset. Depending on what you like doing. Certainly for 'waterfowlers' and people who like knitting flounder and stuff like that. Yeah it's a great asset.

Natalie: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee Y: the edges of it anyway, they've redug a lot of the old ponds on the edge that were – had been drained in the past and put them in again, and reflooded them and replanted

them. All the works more on the edges of it, creating buffer zones around the edge. The actual lake itself, I don't know what you can actually do to improve it, because it's just got to be a lake. The buffer, the filtering zones around the edge are going to make a difference to it.

Natalie: How important to you are the conservation efforts regarding Lake Wairarapa?

...Of course [conservation] is important it's like it's to keep it, it's not going to be an overnight fix, but it depends on you know, it was never a 20 meter deep crystal clear lake that was never the type of lake, it was -ever was. The effect of nitrogen leaking and everything else, I don't know what effect it has on it. I've never seen any real study that's been done on it, how it was 100 years ago to what it is now. 100 years ago, none of it was ever recorded. Certainly, I don't think it's degraded a heck of a lot on my tenure here, but it's- if you don't start now, and another 100 years time. You could be- end up with a real mess.

Natalie: Do you think there needs to be more anti-pollution measures to be taken? Please specify.

Interviewee Y: I think probably what we actually need is proper some monitoring, so you could benchmark it, then we know if it's – if what's happening's working or if it's getting worse, if you haven't even got a benchmark, you could get somebody that thinks it is and will rant and rave, there's no real science behind it. Most farms if you show us the science will go out there with you, but prove it. If we had a benchmark that then yearly checks of what's happening. You can soon load up a picture of a trend and say what we're doing, the measures we're doing now are working or you could say they're not. It's turning into- the PH's are changing in the water, and this is changing. We need to do something.

Natalie: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee Y: Yeah, Reasonable amount, yeah. I've seen a video on them doing it. Yeah it was dredged, like with a big walking drag line. I saw it when I was a child. Basically the Ruamahanga River was diverted about [my old box] so it used to flow into Lake Wairarapa then spill over through the narrows into lake Onoke, and then make its way out to sea so then it was diverted straight into there. There's a couple of spillways, one a piakia, Pakiata loop, a spillway there so if it gets too full there, it will flood across there straight into the lake. There's another

one at Martinborough that just cuts out a big loop in the river. So it saves the water a day in travel time going about a big loop it will cut across. The scheme itself has worked to its design parameters. Pretty much exactly as it was predicted, supposedly.

Natalie: What do you know about the Barrage Gates?

Interviewee Y: Basically that they're there to, when the river's really, really high they can shut themselves so the water won't go back up into the lake through the narrows or in the summer we're supposed to shut them to keep the water level where you want it in the lake, store water for flushing it out, when we have to open the mouth. Basically its purpose is to block the narrows off, that's where the water comes from one lake to the other.

Natalie: How does the operation of the gates affect daily life/farming?

Interviewee Y: The actual day-to-day running of it doesn't effect me a heck of a lot, not a heck of a lot. I do wonder if, how much the lake level affects our water table here, like if the lake's lower on a dry summer do we dry out more than if it was higher and keeping our water table up. How you know that for sure, that's only guesswork.

Natalie: How do the gates affect the environment?

Interviewee Y: I don't know if they have a huge impact. They may slow down or restrict the movement of fish from one lake system to another lake system, but that's only really. There is a fish trap there that they can - Most of the time they can get through, there's lots of little sticks that can get through it. I don't think it really makes a heck of a big difference, and probably for a lot of the bird life, and a lot of the little things that live in there, and having the water levels kept higher in the summer or at a more even level, probably is really beneficial to them, I would've thought. All those things that live in the little edges of the lake if... yeah, they're gone. On the balance they're probably quite beneficial.

Natalie: What do you know about the barrage gates resource consent?

Interviewee Y: Nothing at all, really. To be honest. When they were built, we did not have- the resource management act was not enforced. That's that whole RMA thing has become a They make a bit of money out of it and no one can give you a straight answer to what it is. It's

always one person's interpretation and then you go to an engineer they go "no you don't have consent to do that. " Local council likes to get a consent for everything, because it's money.

Natalie: What do you think would be a reasonable compromise regarding the operation of the barrage gates?

Interviewee Y: I just like them when I say. Probably it needs to be, maybe, somebody in the council who does their dedicated job, apart of them and they need to have some parameters that are established, and people agree to and say, keep the lake if there's and we hut the gates until it gets back to here. Otherwise it seems pointless having them really.

Natalie: What do you know about the Ruamahanga cutoff?

Interviewee Y: Quite a bit, actually. It's just there, my farm boundaries about a third of it. It's basically a backwater to the lake now. It started. When you go down to the end, it's silted up, quite a bit. So it's almost cut off in the summer now when the water level drops, but if I would of fixed it, my neighbor's got the consents, I think, to dig out around a side of the island and use it to build a stop bank... which will let water in and out a lot more because it can get quite stagnant in the summer. You wouldn't swim in, people ski in it.

Natalie: Does it affect you in any way, are there any adverse effects?

Interviewee Y: We get a lot of mosquitos in the summer as soon as it gets humid because you've got a big body of water. But apart from there lake flies and mosquitos, it's just there. You know what I mean it's there, we live with it, and it's fine. We use it for stock water. It's a nice, you know sort of muddy and stuff, and we've planted a lot of it now, so it's looking a lot more attractive. And it's an asset- I like tracks of water.

Natalie: How much do you think you benefit from the Lower Wairarapa Valley Development Scheme?

Interviewee Y: The scheme itself has been a huge boom to farming here, you know, you're just waiting for a disaster, without it really. Many guys farmed but nothing to like it's full potential. Farming's a risky enough business without having that sort of hanging over your head. Saw these days where it would be flooded and a lot of it wouldn't go for 2 or 3 months. Because you're

basically in a basin and if you're next to a river that floods for thousands of years, it builds up beside the river. It's actually lower away from the river so it floods, and then that's pond, until next summer.

Natalie: Do you believe the benefits from the gates are worth your personal annual investment?

Interviewee Y: Yeah they are, but technically... we've already paid for it. And I know there's still ongoing costs, maintaining it and everything else, but we're paying for stop banks 20 miles upstream, which would be a waste of time without the scheme down here. It would be a waste of time for them to stop bank because there's nowhere for the water to go. It's got to be a total scheme, but we've paid for the expensive bit. These guys have been paying, for example, I think I'd be, average over the last 30 years we would be paying at least 10,000 a year towards the flood scheme. There's guys upstream who may've been paying 1,000 to 2 thousand dollars, that live right beside the river, but they're not in the lower valley catchment board area. And now they want \$1 million worth of stop banks on their farms, which I've never had any stop banks built on my farm, nothing's ever actually built here as part of the scheme. All they ever did was cut the river off at the end of the road and build the floodgates which – well they do directly involve me but it's like, none of that money's spent on this farm.

Natalie: How should the funding plan be changed?

Interviewee Y: ... the flood scheme's paid off, maybe that should be spread over a wider area. We seem to cop all of the big rates for the scheme down here, because their new regional council model was... "The lower your farm, the more you benefit." So the more you should pay. Yeah, but we have paid. We built the bloody scheme, and now you want us to pay for somebody else's scheme, that's been using the scheme... It doesn't matter what you do upstream, if the far end of it's not working, the water's going nowhere, so it's got to be a whole holistic thing. I would like to see it more like- we were told our rates would go back to like everyone else's once the scheme was paid off. It gets more and more expensive to do anything to a waterway. But I think we should be paying, the same as anyone else now, and they should be paying for the ongoing maintenance of the Lower Valley scheme as well, and we're paying for the stop banks further up. So it should be shared a bit more equally amongst the whole farming community, not just the

ones, just based on- we're taking care of people's water who lands on a hillside, runs into the river, and ends up on my doorstep for me to deal with. They're paying nothing towards it....

Natalie: What overall advantages/disadvantages are there with the current flood prevention scheme?

Interviewee Y: The only disadvantages, I suppose if you- at one time we used to have a river flowing past the farm and then we got a backwater. A nice flowing river would be preferable but then it would flood us so- Aesthetically it would be nicer, that's about the only real disadvantage of the scheme. I mean the rest of us are all paying big pluses farming wise.

Natalie: What other issues regarding the Lower Wairarapa Valley Development Scheme do you think are important? Please elaborate.

Interviewee Y: No, to be fair it was a really good scheme. Europe engineers built it. We've run out of money so we should build a new bridge at the Lower Wairarapa Valley. Dredge it up further then we wouldn't need a spillway at Oporua. We couldn't have afforded it at the time, and down here they built a new bridge on dry land and dredged under it. So it'd be cheaper to build, yeah we couldn't really afford that. Then we should have dredged a channel out to sea, a big ocean going dredge. So you didn't have troubles with the mouth blocking, but once again that was going to be an option this whole area wouldn't afford.

Natalie: If there was one thing you would like to see going forward regarding the Management of Lake Wairarapa, what would it be?

Interviewee Y: To take it away from fish and game. It depends, in the past the fish and game guys were great, then you'd get a different crew with a different agenda, and their agenda is to turn the country back into what it was before anyone ever came here. And realistically that's never going to happen, but that's said, anything that wasn't here, apart from the Māoris, a few Māori running around, should be wiped out, and it should all turn into bush and everything else, but that's never ever going to happen. I mean there's going to be some middle ground somewhere, where you can sort of save part of it. It doesn't all have to be completely developed.

Natalie: That's the last of our questions, is there anything for us. Do you want to mention anything else?

Interviewee Y: I does get quite interesting, we're actually very close to having to pay farm tax on our sheep and cattle producing methane, and I've said I've drained a few swamps in my time, and they make a lot of methane. That should be a credit. It does seem in this country, anytime they need to spend money or to pay for something, they go "who's got some money but no voting power, the farmers" ...

Austin: Do you know how the budget works for the annual maintenance?

Interviewee Y: I have got a breakdown we do now and again we do get a thing from, I have a quick look at it then I cry and put it in the bin. So much for river back protection for river boulders and riprap, and so much for stop bank repairs and I do get information from time to time, to be fair, where they're spending the money

Austin: We're working with the Greater Wellington Regional Council We were going over how the scheme is paid for, and we thought it was interesting that none of the local, SWDC, or any of the local community councils, didn't contribute at all?

Interviewee Y: Yeah, but then they don't get the rights for it either. We pay a lot of local council rates and then Wellington Regional Council rates, so anything you do has got to be overseen by Wellington Regional Council, I'm working for an earth moving contract, and I'm doing quite a lot of work and that is a tremendous waste of money. In some areas it does seem common sense does not prevail. I suppose at times, you'll get a lot more environmental watch dogs watching what you are doing and monitoring all the effects and stuff, which is good, but I don't see how much of the job is cost out to that. Not always the most practical. Sometimes I think if they actually sat down and realized what they were doing, They're doing more harm than good to a lot of stuff, not realizing it, the actual effects when you think about it logically. We do from time to time get a breakdown of the way the rates are spent, the proportions. Apart from that, the actual scheme itself has worked fantastically for this area. ... While its there, no one worries about it. If it's not broken don't fix it. The infrastructure there has worked to its design, really, really well. The funding of it annoys me a wee bit, the fact that we've paid for it, having

paid the scheme and now we're still paying, more rates than when we were paying the scheme off. I do think the maintenance of it is up to everybody that's in the Wairarapa, because everyone's water goes into it, eventually it all ends up going out there.

E.5 Recreational Water Users

A. Interviewee Z

Austin: How long have you lived in the Wairarapa region?

Interviewee Z: So, I've lived here most of my life but I've lived large parts of my life in Wellington... I'm my late forties now so in terms of actually living probably half of that in Wairarapa and then backwards and forwards on the other parts....

Austin: Can you describe your activities and lifestyle?

Interviewee Z: So I work for, this is a new job for me, I have been the manager for something called Greytown Sports and Leisure society effectively a cooperative model amongst a group of sports club so there are 16 sports club in the town those are their logos and shields... it's a reasonable typical collection of New Zealand sports organizations with a few ones so the bridge club and the glider are probably a little bit different, but otherwise it has got reasonably traditional New Zealand sports rugby football soccer cricket tennis swimming netball the gym those sort of things. So I work providing. We are kind of cooperative and the office that I manage we provide management support services to those clubs. We are also working with the local council South Wairarapa District Council to expand the model into the other the other two South Wairarapa towns, Featherston, and Martinborough. Effectively provide administrative support underneath. And so that's what I do. Prior to that, I had a lengthy in the public service as a policy advisor to the central government. I was an academic lecturer in anthropology and I do a whole lot of governance work for organizations... and I've been a director in different iwi and corporations and businesses and things like that so a lot of governance and experience and reinventing myself as a sports administrator in my late forties. So that's my job in terms of life style... We live next door to our family marae so we live in our marae village. I'm the chairman of the marae... We deliberately chose to raise the children here because home is really important and for the kids to grow up here is very important next to their family marae in our home town playing rugby for our own rugby club swimming in rivers and fishing and diving out on the coast we wanted our children to have that lifestyle... so yeah.

Austin: What do you value most about Wairarapa Moana? Why?

Interviewee Z: The Lake itself or the lakes plural. They are particularly for us guys in the south Wairarapa You would have known from speaking to other Māori. They are a critical part of our identity. When identifying ourselves to other people, we start by saying the name of our mountain and the name of our lake. All of the rivers and waterways here flow from the mountains over there into the lake so spiritually it's hugely important to us it's the identifier. In terms of life, my father died when I was young my mother is from here. So I lived with my mother's people and her brothers you know they took us down to the big lake, Lake Wairarapa. You know, I've grown up catching flounder fish in that lake. I've grown up fishing for eels in the streams and rivers. My kids all know how important the eels are... For me at another type of level I don't mind sharing this with you guys because hopefully it helps out the research. I'm you know like a lot of Māori people I have you know sort of spiritual belief but I also like to think of myself as a fairly type of rational person. But I know just for my own personal sanity if I need to take time out to breathe and reflect about the universe I drive down to the side of that lake and I just sit there and I teach my kids to do the same thing. The kids know it metaphorically as the eye of the fish so yeah I know that traditionally Māori people use that river for recreation food and all sorts of other things. The rivers and the lakes themselves at the moment we are on the verge of using them again for recreational purposes. Foodwise, we know New Zealand livelihood depends on converting the environment to food that we can then export to the world and water is important in that process, and I personally believe that we got to, its horrible, sounds kind of ... but we need to achieve a balance between using the water for those types of purposes and maintain integrity about the flow of the river and the ecology and the things and species that are in it.

Austin:

Interviewee Z: So we are, as I was saying to you... we are working with sports clubs... so I'm in discussions with the Wairarapa power boat club and you know the diversion there's a garage style building with the shipping containers along the edge of the diversion is kind of near the barrage system those garage style buildings they are run by something called the Wairarapa Power Boating club so the membership of the club is going through a sort of stage of flux so I

am talking with them and talking with our relations at Kuhungunu the Big Fog about reviving waka... may have said that we are experimenting with getting waka [hama] the double outrigger canoes back on the lake so this summer we have been doing some testing of the two lakes... so we are testing them out for outrigger paddling, canoe paddling, the Wellington rowing club sends boating crews to train on the diverting strip and I know one of the clubs we support is the Wairarapa water ski so all of those organizations are sports entities that need water you know flood water... to train on. I am working with those entities why don't we part of what we do is encourage collaboration. They do find it hard to be able to maintain their assets in this case the power boat club has a hard time maintaining their garage style building and shipping containers. So I'm saying to the other clubs lets buddy up and form a unified water sports entity that can support those recreational activities on the various water ways and also probably in terms of interacting with the authorities and the other water uses and parties that have an interest in the water including the iwi and the environmental organizations that there is a voice for recreational sports and uses of the water ways... So yeah in terms of uses, those are the uses. I like to get my iwi hat on or my Māori hat on its kind of sad and you know the environmental pressures on those water ways and you know the economic challenges on those waterways but this is another aspect of human interaction with those waterways that kind of been lacking for a hundred years but you know the sporting clubs, I think, if we are organized, we can make a contribution to the other issues the maintenance keeping the things clean and [inaudible] what sort of behavior is expected on the waterways and become another voice for looking after things like the hunters.

Austin: What do you know about flooding in Lake Wairarapa?

Interviewee Z: Yes I mean traditional knowledge. I know, do you know what we call it I'm having a memory block. The lake naturally has had times that it flooded our people had a name for it ...and at that time of the year or the cycle is when the eel food is plentiful. I know from talking to my from my oral tradition there are stories of the lake almost doubling in size and the [papanui] which is three four kilometers outside of Greytown... So there is actually that historical moment when the lake was gifted that the photo of that transaction happens at my marae... I understand that us people in Greytown are the northern people of the lake... share subtribes that connect us to our cousins... and so you know, my knowledge of the lake, flooding of the lake, and the would almost double in size but that was critical to our traditional economy

customary economy ... Lake Wairarapa that is. I know of course the whole story of the cutting the hole into the sandbar to enable the water to flow into the see. I have grown up most of my life here and my friends are the descendants of those original farmers.... I coach junior rugby with the descendant of farmer Mathews who lived the move to cut the whole in the sandbar and become an environmentalist... and he's a friend you know but I know my ancestor was one of the opponents of that process on the other side and they came to physical blows with each other... I respect too that his ancestor afterwards became a real passionate environmentalist for a farmer and my ancestor is and he is ... and he is for an event around that lake... he is named for the blind eel. There was a storm event where a whole lot of high genealogical chieftains were killed on a lake they were right on the lake so there is a history of people being out on the lake and very now and then the lake claims people's lives. And my ancestor...but he after this event all of the [inaudible] lines were drowned so he... became he was next to become leader. So my ancestor is named after a big event on the lake that led to him becoming the chief of our people at the particular point in time. So I know the farmers even to this day their economic prosperity to the region to a certain extent relies on them having certainty around farming practice and what the water ways do. My question to Ian is, I actually asked Ian this when I was chair of Kahungunu is what flow of water would enable the lakes to have a bit of a clean out but minimize the flood disruption to farming and I still haven't had anyone tell me the answer...What is the flow that would get a decent clean out minimize the disruption to the ecology and allow reasonable certainty for farming. I think we should as humans ask these questions and I'm glad to hear you are engineers... Also I think the Polynesians are ocean explorers that knew read the stars and waterways and those sort of things you know arguably the greatest ocean explorers in the world... in terms of colonization of the south Pacific, they must have been pretty good with the science you know you just don't set out on 10,000 kilometers of sea by accident so I think there is nothing new in humans using the technological knowledge that they have in to be able to achieve exploration in the case of colonization or in this case getting a balance of achieving a balance of goals economic and sporting and cultural around these waterways.

Austin: Is flooding well-managed?

Interviewee Z: I don't hear farmers complaining. I don't hear I know on the iwi side the stronger environmental voices that you guys have probably met... I know the salting degradation of the lakes and the flow of pollutants from the towns and the humans and the farms is a source of consent for all of us. I think The New Zealanders have generally pushed out the toilet and the water just flushes out somewhere and I think we are at a point in time where I think we are at a turning point where the new Zealanders or all of them...are thinking this is kind of barbaric and we need better solutions so 20 years I've been involved in iwi politics and for more than almost 30 years If I had said something 30 years ago I would have been decried as some obscure radical tribal activist but now I think it is generally accepted that dumping stuff into water is barbarism. So, do I think it is well managed? I think I don't know I'm hoping that some engineers come along... and give us some better advice about better management of the flow of water. I think if we can use it for irrigation and for energy purposes and not compromise the other values... so I guess I'm kind of saying no as well. I'm saying yes the farmers are not minding about flooding but no we can probably do a lot better.

Austin: What do you think of the current lake water levels?

Interviewee Z: So its enabled more land to be productive for farming but some of that farming I've been involved on farm boards I'm not a famer but I've been a director in farm businesses and I know enough to be able to read a financial report on a farm business to be able to see that some of those low-lying farms or the lake edge farms they are not efficient in terms of I mean they can get with a whole lot of inputs they can produce grass. I think some of those farms you would need to look at it from an individual farm basis you would want to ask some questions about whether the amount of energy required in terms of prevention of flowing and either they are so low lying that, I think probably some of those farms, should be retired into lake and I guess that will raise a whole lot of questions about compensation for farmers what are the impacts if you raise the water level on one side and what are the impacts going to be on the other side but I think it would be hard to say that the water levels are optimal... I think that they are too low in some parts and that some that lake some of the farmland should be retired into riparian planting probably not riparian but planted.... I think we are going to have to have a plan to reduce that and I think I'm a pragmatist I don't think we will restore the water way to what it was before and any humans arrived in New Zealand...but I think that we should probably come to a

consensus about where we think we should restore it to and do everything we can do within engineering and biological systems knowledge to be able to get it there. So I do go and sit here for a bit of spiritual time out for myself I want to get my kids paddling there, I want my descendants to be able to fish for flounder, but in the moment if any of my kids touch the water I tell them to immediately wash of... If an engineer can tell us how much water we can allow back into that lake to allow some sort of a clean out without compromising the other things that would be a nice problem solved.

Austin: How are the fish in the water system important both to you as an iwi affiliation and as a sport?

Interviewee Z: I don't look after any of the kind of hunting fishing recreational kind of user groups but I know the fishing, yeah for the ducks and the fish guys yeah it is important. Traditionally yeah I grew up some of my cousins my first cousins my uncle kind of became my father figure sorry I'm looking at ancestors behind you guys. My mom's brother, I'm one of five children but my uncle who was like the chief or our family he had ten children and he relied on going out to the coast and diving for 'paua' and crayfish and going to the lake and getting flounder to feed his family because you know they're not wealthy people and I know I still have cousins who it is not like a staple anymore but there are are cousins I know that really on catching eel to keep their cupboard full, even now as a food resource those its important those eels are important. I know stories from my mom's cousins that the time, geez I wish I could remember the flood time from about thirty meters out from the lake there would just be a scenic black mas of eels and the uncles would go down there and gather these things and dry them and process them and I have lots of family stories how they would go on for two or three weeks they would you know gather a chunk of eels and then go to different family's houses and distribute them and have a big party and you know that was part of their life and there were parts of the year that they did that so these were my mom's brothers you know my mom is 75 and her oldest brother is 85 so that was part of their life and their stories are handed down to me I know that when my both my grandad my mom's dad went to world war 1 ... which is like an engineering Māori soldiers where kind of like engineers. They dug trenches essentially on the front line, and his wife my grandmother used to send him dried 'kakahi' the freshwater mussel it is like a chewing gum... I wouldn't eat one now but you know those freshwater mussels...you know they

dry them out put them in like a little container and they send them to the soldiers... and they love the bloody stuff I cannot stand it. I'd rather chew juicy fruit... but it was kind of like a tradition chewing thing. So the food in my life, the food is still important. I haven't taken my own kids floundering down there yet just because of life time and things like that. Definitely in terms of the rivers I don't go out I have been white bait catching down there but I'm more a white bait observer than a white bait catcher but my cousins are white bait catching white bait down there all the time.

Austin: How do you feel about the native fish vs the exotic fish?

Interviewee Z: Yeah I, so the 'Papawi' stream which goes through my house at the back of the marae is one of the I think it's a rare waterway where its 75 longfin eel to 25 shortfin eel and I think most of the new Zealand water ways are the opposite 75 shortfin and 25 longfin. So we are aware which you guys will see when you meet cousin Michael is a significant waterway I think there are only five or six water ways like that in the country so we are cognizant of that... We put a traditional type of ban on fishing behind the Marae because the marae is a place of visitation for school groups and we want kids to see the eel food not the eel food the eels themselves. It's amazing the marae I shared with you before was the home base of the Māori 'pala' and we have talked to the visiting school children and learners but when you ask kids about what they remember about staying at 'Papawi' Marae its always about feeding the eels at the back of the stream and the city kids particularly... so you know, yeah the native species are really important, I'm not an ecologist is that the right word, but I understand that they have an important role in terms of the ecology of the stream and the plant life in the stream. The marae was a lead in the first riparian planting project in Wairarapa so the marae plus the farmers and landowners got together and we have when you see the marae our stream was infested with cracked willow which is an amazing tree you just snap a little needle branch off and dig it in the ground and two minutes later it's a tree growing an amazing plant an amazing tree fast growing but it sucks water, you could almost visibly see it sucking water and it essentially started to do strange things to the stream so we got together as a bunch of neighbors and we were the very first riparian planting scheme in Wairarapa in 2001 we were slowly ripping out the cracked willow and replanting the native and you can see you can visibly see positive things happening now after fifteen years in terms of your starting to see signs of a [inaudible] bottom of lake im

sorry of the stream bed. I don't know if it started I know perversely when we started pulling the willow out there was a shock effect on the eels and some of the fish species because they like the shady stuff so they were suddenly exposed to a whole lot of sunlight and also you'll see an infestation there of a species of plant called cow grass which looks like it could be water crest which is another food source... and that's function of light and the waterway being exposed to more light as we pull out the bad trees and replant I mean no tree is a bad tree and pull out the willow and replant the natives. Now eventually the natives will provide a shadow canopy and a better environment for the fish species. Having said that my father's tribe lived by Lake Rotorua in the central north island and they still own one of their lakes and that's the best trout fishing on the north island apparently and I go trout fishing up there with my cousins and I love trout fishing. So I you know I'm not I just don't know the impact the trout have on the native species I am assuming its negative but as a past time I enjoy I don't mind I quite like I quite enjoy eating that fish, it's a non-native fish. Yeah I guess if the impact of that species was too severe on the others we would probably want to eradicate it but while in the river near the marae is one of the better trout fishing rivers in the Wairarapa... I don't know if you get trout on the big lakes do you guys know by any chance. I've never fished trout on the big lakes but I've definitely fished for them in the rivers. I'm assuming if there in the rivers they must eventually make it to the lakes.

Austin: What is the state of the water quality in Lake Wairarapa?

Interviewee Z: Its appalling isn't it. Its super trophic or whatever the word is. Yeah, so we have to come up with better solutions around nutrient leech from farming. I have an interest in the farm sector. I think I think. New Zealand is quick to bag the farmers I don't think we should... because some of the best environmentalists are farmers. But I think we need the whole sector needs to adapt an environmental stance in terms of efficiency of farming long term and in terms of making better use of our land because if you continue to try to prevent flooding and all the rest of it your probably on the wrong bit of land but also in terms of the perception of new Zealand farm products externally you know if people are not dumb and people work out that New Zealand's green reputation is bogus then eventually it is going to have an impact on the market perception... so I think that we have to get better knowledge around my understanding from iwi in the south island is if you plant up to 15meters away from the waterways certainly the rivers

and streams then you can have a significant impact on reducing the nutrient flow into the waterway so if that's the answer why wouldn't we do it so I think we need to do that. The humans themselves are the worst pollutants and you know I've noticed with mates in the big cities they can thump the tables and be as environmental as they want but we are probably going to need to stop, I think we need to really investigate solutions that stop sewage pollutions at the point you know where humans live and you know that would hugely benefit that kind of pollution to the waterways you know at the moment in a flood scenario human crap gets washed into those lakes so we need to investigate solutions and you know and building and engineering solutions at the point of discharge. I mean I live in this is a Greytown is a beautiful pretty town full of fairly well wealthy retired Wellingtonians and new comers... who would probably be shocked none of them know that the sewage plant is next to the marae and they probably have no idea of their individual contribution to those lakes but they got plenty of money you know and if we said to them we need more education about the options for the treatment of sewage and the houses. I think also, we should investigate new Zealand just sees it as something we have flushed the chain or washed it out to sea or washed down the river discharge the land for now looks like one of the solutions available to us and we need to move to that deliberately and rationally but I'm aware there are some countries in this world where treated human waste water would be seen as valuable as an asset and I think we probably need to start changing the mindset as well so that we need to start exploring the opportunities around sewage as an asset so if this was the middle east they would be doing a whole lot of stuff... so I think yeah, so yeah the waterways are currently badly polluted and they need to be and that needs to be addressed and it will require some investment and it will require some science and require some knowledge.

Austin: What are your views on irrigation in the region?

Interviewee Z: Irrigation of I control of irrigation is important in terms of new zealands economy... I think though we need to understand the impacts of taking water from the underwater aquifers or from yeah if we are going to take it directly from the rivers and the streams which happens now I mean clearly we are going to have to understand what we are doing the impacts of that I know from a farming perspective irrigation gives you stability over your farming practices and over your business and stability of income but once again I think we need to be strict in how permission is given for irrigation. I think it needs to be strict and there

needs to be targets set around the way the water is applied to the farmland so you are not over irrigating you don't need to and yeah I hope we are not being naïve about the long term impact on the deep on the ground aquifers though by use of irrigation and I hope we are not naïve about yeah Its obviously going to be a contributor to lower levels if your pumping it straight out of the lake so I'm not anti-irrigation per say but I think we probably need to be. I suspect our science knowledge is probably lacking.

Austin: What is your opinion on the current status of the wetlands on the eastern side of the lake?

Interviewee Z: Well I like my earlier answer some of the farmlands there need to be retired into wetlands. Yeah there is probably some good work being done down there in terms of riparian planting. I yeah I probably don't know enough about the impact of the wetland schemes on the current ... the government probably thinks it's not enough you know. Those wetlands are important in terms of birdlife and fish life yep.

Austin: What is your opinion on the RAMSAR status?

Interviewee Z: Yeah I've forgotten but I do know what Ramsar status can you remind me I do know I've read about Ramsar it's a global pollution assessment thing isn't it.

Austin: It gives status to bodies of water that are important to unique wildlife and things like that.

Interviewee Z: Yeah and it is very poor for the lake isn't it.

Austin: Well they are applying for it. It is for recognition of the status.

Interviewee Z: So I guess I knew what it is but I wasn't sure where were at in terms of yep. Waterway of natural significance absolutely second biggest lake in the north island tribally significant for all the humans beautiful lake you know I love that lake you know it is kind of funny probably like just anywhere else in the world humans like living somewhere where they can see some sort of water it is kind of bizarre there is not massive explosion of lifestyle blocks around that lake it is kind of like a best kept secret... it is like the mad cousin down the corridor and nobody talks about them just hide him in the back room somewhere in the house just ignore

the screaming but anywhere else it would be quite desirable...[inaudible]... my uncles remember that being a blue green color lake and it might be there it might be I'll used an American metaphor there warped view of life when they were children but their distinct memory is of it being a bluey green color so it would be interesting to find out my whole life it has been a brown mud puddle... so and I was quite surprised to hear my uncles say that they remember it being a bluey green color and you know it is always been a shallow lake. You know it is interesting from kind of a boating recreational perspective we want to get the traditional wakas out again but we are nervous about... we have songs that contain warnings about being careful on the lake. There is a traditional song that says it is a provider lake but you need to be wary of it and we want to get our kids paddling out there on the double outrigger canoes and traditional canoes but we know that you have to be wary of the shallowness of the lake even before the recent hundred years of farm pollution it makes it dangerous your vessel can get snagged on a tree branch and your stuck and we know the lake can turn quickly that you know a 4 meter swell or a 6 meter swell on the cook straight comes up quickly and you are in the middle of that lake, a kilometer from shore and your and the waves are suddenly 4-6 meters high and you know every now and then people drown on that lake. The most recent significant big drown was ten years ago and some DoC researchers were out there and the thing turned really quick. So all of our tribal stories are full of warnings about how it can be a provider but be careful.

Austin: How is the whole area important for recreational activities?

Interviewee Z: Yep, so one of the travesties about, I think as a marae leader, that our people had become disconnected to the lakes and the water ways you know Māori people and we are becoming we are some of the more passionate environmental champions of the health of the waterways and the lakes but our kind of recreational use of the lakes has become almost minimal so it has tragedy you know we are traditionally a river waterway people and ironically my children go to school in wellington and they compete... one of my sons is actually a national champion and they train on the sea in wellington and the wellington waka 'hama' clubs want to come over to Wairarapa and train on the freshwater because the freshwater, you get less buoyancy and it makes it more of a challenge for paddling and the sea based canoe clubs waka 'hama' clubs they find it harder to adjust to the fresh water competitions when they go to the big lakes so they want to come here and train they know we got these rivers and lakes that are

freshwater so they are being really supportive with us guys about us reestablishing our recreational use of the lake for paddling and for us of course it's about the lakes and rivers restoring their place in our live. I actually enjoy waka 'hama' as a sport it's like dragon boating... its competitive and I think the western sides of the states there are people that compete in Hawaii. The Hawaiians are global leaders in waka 'hama' paddling it's an amazing sport they paddle in 10 meter waves... and they go in the ocean they go 100 mile race and they're out at sea it's amazing you know it's a great sport. So yeah we need its part of which we are its part of our identity.

Austin: What do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee Z: Yeah I have a reason... You know their origins and the disputes we talked about before and how the scheme evolved in the 1900s and then the 20th century... the thing was seen as an advanced kind of thing so I'm aware of it and yep, pretty much.

Austin: How does the operation of the gates affect daily life and people trying to do recreational activities on the lake?

Interviewee Z: Yeah we can in terms of recreation you know but only the diversion the long straight is good for power boating good for waka and good for rowing and those sort of things... The water skiers there are parts of the diversion the water skiers use but I also understand... I'm not a water skier but I have talked to them they can actually ski on both sides of the barrage. My cousins who are much bigger into fishing they all talk about how either side I think it's one side of the gates over the other ironically is really good for fishing... it must be good my cousins actually say that's a good spot for fishing but that's I guess when they are not open and when they are open they are probably not good at all but you know yeah well those in some ways are positive impacts of the barrage system. In terms of negative, yeah I don't know. That's probably enough.

Austin: How do the barrage gates affect water quality?

Interviewee Z: So they are draining off Lake Wairarapa are not they and you guys might have to remind me the diversion diverts the Ruamahanga river off the big lake sits like a puddle... the

barrage gates enable the water to come out of the big lake flow into the river and out to sea, yeah that's how it roughly works.

Austin: Or vice versa so like

Interviewee Z: I'll hold it up if you want to hold it up. What was the last question, how does it affect the?

Austin: How do you think the barrage gates affect water quality?

Interviewee Z: Well, it clearly stopping the natural flow of the river into the lake the diversion and the barrage pervert the natural flow the river into the southern part of the lake and out again so it's obviously so some of that natural desilting is reduced and so its silting up and contributing to the around the lake and that's probably the most obvious effect and its obviously regulating the depth of the lake as well.

Austin: What do you know about the barrage gate resource consent?

Interviewee Z: Nothing to be honest with you sorry I probably should know more. When is it?

Austin: So the one it currently has was approved in 1999 and expires in 2019 so essentially that's why we are doing this.

Jeff: And in 1999 it took six years and we are doing this project to make it go faster.

Interviewee Z: I guess wearing my recreation hat the ability to create lakes and ponds is a positive for the recreational users or the recreational users that I look after. Certainly a flat bed of water is good for water skiing and canoeing and those sorts of things.

Austin: Regarding the resource consent, what do you think would be a reasonable compromise regarding the operation of the barrage gates?

Interviewee Z: Some of the guys at the regional council and maybe some of the engineers and the scientists know we have to make some choices about water flow, and I just hope the people making those choices are informed by the best science knowledge that they can get and the best social knowledge that they can get and so those are where the compromises are going to stick.

Yeah, if we can look at this thing in a different way I as you guys probably know there has been some discussion about water storage up in the mountains and I think the guys behind that project are avoiding actively avoiding talking about opportunities about power generation... but I think we need to balance up all the opportunities and have a discussion about those things.

Austin: What do you know about the Ruamahanga cutoff?

Interviewee Z: Yeah I know roughly where it used to go and I know its farmland now but it looks to me like not the most productive bit of farmland it's full of bull rushes and things like that. I know a couple of the farms in the vicinity have to invest quite seriously in drainage you know and I think you have to ask them serious questions about that whether long term that's an optimal use of the land the answers probably not. They can be very productive farms I've seen the Māori education trust farm when its being well managed produce really good milk but they are continually having to maintain the drainage and the kind of crops they used to be the lake bed and continually trying to develop...but it's probably not the best use and chunks of it probably should be retired into lake bed.

Austin: Is there anything that could be done to mitigate any negative effects caused by the cutoff?

Interviewee Z: Yeah well ironically the cutoff has provided some opportunities for rowing, waka, and waterskiing and those sporting activities. What I do know from the clubs though if I were to be totally brazenly honest you can get three lanes of canoes or rowing boats on the river... and for most competitions you need six lanes so six lanes would be great.... I don't think we will ever use it for competition... from a recreational perspective regularly monitor and dig it out and the gravel must be getting pushed down... So those users would probably appreciate a more regular program of cleaning out the gravel. Depthwise, I think it's okay the bits that they use it are probably okay... you probably want a couple of meters and now in terms of kids you don't want it too deep... a couple of meters is probably good from a kids recreation perspective.

Austin: What overall advantages are there with the current flood prevention scheme?

Interviewee Z: The overall advantages are clearly about more certainty and less flooding for farmers.

Austin: What disadvantages are there with the current flood prevention scheme?

Interviewee Z: The overall disadvantages are silting pollution. If this was a hundred years ago it resulted in so my ancestors were known for their eel food it was our traditional trading and it was our traditional trading food so that whole period of history has resulted in the complete upheaval of my ancestors. It was the thing that fed a whole series of marae around it, it was the thing that regulated their life their recreation you know everything and the impact of those schemes was to absolutely and completely disrupt their life so it was like the Americans almost the same type of impact when the native peoples were moved from where ever they used to live and plopped in the desert parts of the states we no longer fish and trade eel and live of the birds and fish life we live a different way so total impact on their life and you got someone that would have told you the story of fifty years of court battles which resulted in us being given farmland 600 km always they are very productive farms now and our people manage them well and we were showing off about how good our farms are... so there was some there was never fighting between these guys and pakeha but the closest they came to fighting was over this closest to warfare was over this there were commissions of acquirement, court battles, there were protests largely by my ancestors and the farmers and the politicians and the lake exchange the gifting of the lake have you seen the photo... part of the conditions of that exchange but there were conditions for providing for reserves around the lake where our people used to live and do their stuff and those conditions were never fulfilled and those debates went on for 40-50 years eventually the crown said to our people hey we got some land its about 600 km away and you can have it and the old people agreed to it and it was crappy volcanic 'pumou' land. Ironically in the 1960s with the introduction of fertilizer it became very cow and dairy farming land. I've been on the board of directors for those farms. The board of directors for those farms the farms have been one of the top ten corporate farms in New Zealand by production and profitability we're a model for dairy farming in New Zealand but when I we don't try to shorthand describe that period what happened was that we used to farm the lake in Wairarapa and now we run some dairy units 600 km from where we live my mom had never been to those dairy farms and she is 80 now. The social impact was you know huge and I probably should use the word devastating on those poor people... we probably shouldn't underestimate the impact of that system on one set of humans the other set of humans was able to farm with a little more certainty. It's pretty huge really.

Austin: Which of these issues do you think should be addressed first?

Interviewee Z: The pollution. Yeah. The pollution degradation. But as I said to you guys before I like to think of myself as a pragmatist and we have to try to get a balance. It would be interesting to see... if we let the lake do what it naturally does what would be the economic impact on the farmers so when making those sorts of decisions we are conscious of the tradeoffs the pragmatist in me thinks that the answer is finding an optimal amount of water flow that achieves the best we can in terms of cleaning out the pollution and nutrients but gives certainty to the other users yep I think those have to be the highest considerations and then a six lane waka 'hama' rowing course. And I'm probably that's just me talking personally, I'm sure my cousins would say restore it to what it was 100 years ago.

Austin: If there was one thing you would like to see going forward about the management of Lake Wairarapa, what would it be?

Interviewee Z: I'm just repeating myself I think we need to understand if we allow 70 cubic meters of water to flow at a certain rate what does that do to the silting and the

Austin: We need to find a balance.

Interviewee Z: But use it we need to get our head around the science I think we need to I'm hoping someone is getting their head around the science. It's not me I'm not an engineer but now let us spend some money on some research and some science

Austin: Do you have anything else you'd like to tell us about Wairarapa Moana as it pertains to the flood prevention measures?

Interviewee Z: Yeah, just when you were talking about the impacts there are different villages on the western side of the lake and even on the eastern side, those villages don't exist you know and the families that belong to those villages they come if they do come back home they come to 'Papawi' here in Greytown our marae which you may get to visit soon but I know their village was originally on the shores of the lake and they're totally disconnected now their burial spots are on the shores and they're totally disconnected to those burial spots so the impact has been pretty significant for those people. The buildup of those schemes leads to the kind of

urbanization of the New Zealand population and the Māori population was most heavily urbanized the people were incentivized to work in factories in the city and so it all happened and it's all part of a big part of history but the impact has been that those families in those subtribes the only two marae's Kūhūnia the big fog and Papawī. The little maraes are all gone so it's pretty huge those families have survived but their kids go to school still ... but culturally and historically that is a pretty significant impact you know and the original designers of the system probably didn't do the social science research that you guys are doing they just built a system and it's too late to restore that. I know the ownership of the lake is likely to come back to us so there are opportunities for that current process and through these processes to restore our historical and human and cultural connections to the water way and that's really important and the recreational activities are part of that the fishing activities are part of that the protection of the plant species and fish species is part of that so I try to choose to be optimistic about these things and obviously this consent process need to be informed by all of that... I can see opportunities for what we've done down there is on one hand it's been devastating and the other it's been economically important you know you can see an opportunity for a kind of a visitor center that talks about these challenges and informs new Zealanders about these things so it's no longer the cousin down the corridor it's actually that and the humans are aware of the choices that need to be made and what we are doing and it's not a secret society. Make sense?

Austin: Yeah

Interviewee Z: Probably talked more about the Māori and less about the sports things. Yeah, probably reflects what is closest to my heart.

Austin: Yeah, that's fine.

Jeff: Yeah we appreciate the depth of your responses.

B. Interviewee AA and Interviewee AB

Austin: Can you describe your activities on the cutoff and your lifestyle?

Interviewee AA: Well it all started back in, what was it the mid 70's?

Interviewee AB: Yes

Interviewee AA: Pretty sure it was Mauri Hill that sort of... was working with the council about using that bit of water and all those things for tournaments and training. And they had international tournaments there before early on... sort of late 70s early 80s. And there have just been several groups over the years.

Interviewee AB: Yeah the initial people use it for some years and then they stop. It was unused for probably about ... 5-6 years... You know I came in at that point in time with some other guys and then the water quality was 'not' and we've used it since then umm.. Bevan does barefooting and we do tournament skiing on the slalom course and we've kept it pretty much for people who compete and for serious training...

Austin: Who has access to the cutoff?

Interviewee AB: ... We have the Ruamahanga Barefoot Waterskiing Club, so we run it as a club which is affiliated to the larger governing body. So, we've got some nucleus to work from... and members from the club... there's only really 4 or 5 boats that have a key to the launch area. We only ever run one boat at a time for safety reasons. This is because in our sport you don't want [waves]... So yeah there are only a small number of us that can use it.

Austin: Are you involved with any other organizations?

Interviewee AA + Interviewee AB: No

Austin: Okay, How does the barefoot waterskiing club... do you have an agreement with like a local council or something that allows you to use that? Or?

Interviewee AB: No, no we don't, in the early years, we did have a formal permit to go and then... I guess it just expired. We and some others started using [the cutoff] again and after we

had started, we began to work with the regional council to try and resurrect that permit... One of the council guys said 'look, it's going to be a real mission to get a full permit and such, just carry on doing what you're doing. The water quality was better than when we had first started. And the farmers are happy. And the place is neat and tidy and no problems,' so they sort of turned a blind eye... we don't have any formal permit, no.

Austin: So do you own the land I guess around the boat launch?

Interviewee AB: No that's all part of the reserve.

Austin: ... what do you value most about the Wairarapa water system?

Interviewee AA: You're talking about where we ski there?

Austin: I guess so, yeah.

Interviewee AA: I mean it's, in Wellington itself, it's probably one of the only... it's very limited, areas where you're able to get the water that that is... to do the training that we've had... We've got another world champion training there and a couple of national champions. Three from slalom skiing and more from barefoot, so you've got probably ten or more national champions that sort of train through there.

Interviewee AB: ... there's not anything like it in the Wellington area. For the way it's sheltered and its layout. There's not a lot of places you can do it.

Interviewee AA: It's not like up around Taupo/Rotorua way where there's just lakes everywhere and lots of places to ski and train.

Austin: So it's because it's calm?

Interviewee AA: Yup.

Interviewee AB: And, there's not the use of the water by the public... there's the river where the diversion is, that's all public there. We used to ski over there a lot, but for what we're doing, we don't want boats.

Austin: What do you know about flooding in Lake Wairarapa?

Interviewee AB: It happens.

Interviewee AA: Probably at least once a year when it comes up probably about a meter or so

Interviewee AB: Yeah at times it comes up over the dock and onto the bank.

Interviewee AA: That dock where you came yesterday and the little steps going down to it. Like during the winter it will probably always come up to the top of that dock, but every couple of years it comes up to the top of the steps... Yeah, really high.

Interviewee AB: And that water level is obviously dictated by the lake itself because there's runoff into the cutoff basically. So it depends on the barrage gates... whether they're open or closed as to how the water level will change.

Interviewee AA: I think it's also affected as well by where the river mouth is. You've been made aware of that I'm sure, that that gets blocked up and...

Austin: Do you continue to train during the winter too?

Interviewee AA: Sometimes... This year we've got the World Championships in America, in our wintertime, it's summer of course. Yeah, I mean it really does get too cold, but we try to do a little bit. In May we generally don't ski at all... it is duck shooting season.

Interviewee AB: When I first went down there... we talked to the farmers... a lot of them went duck shooting. So we had an unwritten agreement that we would stay off the water from Easter through the May weekend just to leave it alone and get out of the area... just to leave the wildlife and so on. The main guy is Stuart, he's just down the road from where the dock is. And he hasn't been duck shooting for years and he said 'you can go down there right through the winter' again it stirs the water up and the water quality is better than it was.

Austin: Yeah we noticed that the other day, you guys went by and it was kind of less turbid.

Interviewee AA: ... yeah that's the greenest that I've seen it so far this year. You might get it like that for about a month each year sort of thing when it's really hot. We haven't had weed this year have we?

Interviewee AB: No, it started but it just [didn't grow]

Interviewee AA: Like we'll be... November/December a lot of weed starts to grow up... I mean because we're going up and down it sort of just keeps it away to the sides.

Interviewee AB: In the early days we would have to stop skiing between just before Christmas until the middle of January, there was just so many weeds where if you fell off you couldn't get up again. And, over the years, that's got better and better. We still get weed, you know it comes and goes but not nearly as much. And you go and look at it in another four or five weeks' time and you'll be able to see the bottom. Nice and clear, not crystal clear but a lot better than it is.

Austin: So back to flooding, do you think flooding is a major issue in the region?

Interviewee AA: Well it's not so much for us.

Interviewee AB: We're not there often during the times when there is flooding.

Interviewee AA: Because it's only really in the winter time, it's very rarely ever happened.

Interviewee AB: Yeah, we've had the odd one over the years... we've been there and the Oporua floodway's been open. And certainly if that's open, our water will come up quite a bit, but not to the point where we have to get out or that sort of thing. The flooding in the Ruamahanga River itself... certainly if we get rain up in the hills, there's a lot of people camp over there, you probably know the little reserve on the corner there, at the end of the gravel road. We've camped there over the years and it'd be beautiful and fine, but there's been rain in the hills and in the morning the tents are floating because it can come up really really quickly and very swift. So it's not so much a problem for us obviously, but you've just got to be aware of it.

Austin: So when it does flood, does that affect your ability to water ski?

Interviewee AA: Yeah, like if it's up really high. I guess the main problem with it when it does flood is there will be sticks sort of lying on the bank and we'll get those sort of floating out into the water... more of a hazard really. Normally when it's flooded, within a week it's gone back down again. Probably more of the problem is when it's a drought and the water level drops too low.

Austin: Do you think the flooding has been well managed?

Interviewee AA: I don't know if it's managed at all...

Interviewee AB: I don't know what to say really because that doesn't really affect us that much.

Interviewee AA: We're not there year round

Interviewee AB: I know the reasons why they put the diversion in... for flood control. I've seen a photo of it.... When the whole south Wairarapa was just under water before they put the diversion in, I don't think the farmers have had too many problems with it.

Interviewee AA: Yeah not where we are do they... the banks are up high enough... Maybe further down by the estuary where it goes into the lake perhaps.

Austin: What do you think of the current target water levels for Lake Wairarapa?

Interviewee AB: For us our water level can be higher than the lake itself... the estuary where the cutoff goes out into the lake.

Austin: I heard sometimes it gets cutoff entirely.

Interviewee AB: It's like that most of the time

Interviewee AA: It's generally only open when it floods

Interviewee AB: As the lake goes down, because the cutoff can't drain into it, where we are can be higher. But, it can get pretty low. Obviously evaporation comes into play a little. But, we can be higher than the lake... if our level was dictated completely by the lake and the barrage gates, and it went down a lot lower than what it has done in the past, that's a problem for us. So if

something was going to happen we'd like the estuary to stay there. I don't know how the farmers feel about that but...

Austin: Are the fish in the body of water important to you guys at all?

Interviewee AA: It's good when the 'eeler' comes along and takes them out. *laughs* every couple of years there's someone who comes along and takes a couple of ton of eels out of there. There were fishermen there for a couple of years, I don't know if they put something in there...

Interviewee AB: We had a visit from DoC a few years ago and there used to be what they call course fishermen up at the corner... And he said 'if you ever seen them putting stuff in there, we want to know because they're an illegal species'... but the fish in there, there's perch and eels... we don't bother with them really. Kids want to go fishing every now and again, that's about it.

Austin: How do different bird species impact the region? As it pertains to you guys?

Interviewee AB: I'd have to say over the years, there's more and more wildlife that's come back into there, when we first started going back into there, with all the weed and stuff you didn't see that much. Now there's plenty of [birds], swans, swans come and go, and you often see hawks patrolling up and down the river banks and so on. I'd say there's more wildlife than there used to be.

Austin: Birds are never an issue?

Interviewee AA: No, apart from making our jump dirty, we have to clean that every time we use it.

Austin: So what is the state of the water quality in both Lake Wairarapa and the cutoff?

Interviewee AA: I don't know what it's like in Lake Wairarapa...

Interviewee AB: We never go to the lake itself. Our water quality is... we had it tested a few years ago *laughs* and they said, 'I don't know if you should be in there' but nobody's ever gotten sick ever. And there's been a lot of people over the years come and go... It can be quite green as it is now, but within a couple of weeks it'll be much clearer.

Austin: So there are issues with the water quality?

Interviewee AA: Well we haven't had any.

Interviewee AB: No, from the health point of view, no.

Interviewee AA: Like it's yeah... not always the most pleasant to look at, but it's good to ski on.

Interviewee AB: You get a bit of an odor at times, part of the year it gets kind of smelly. But yeah that's fine.

Jena: Wait, you said that when you got it tested they said that no one should be in there?

Interviewee AB: No, they didn't say that. They said it was marginal.

Austin: Do you think farming has had an effect on the water quality?

Interviewee AB: I think from the farms point of view, it's improved. Previously on the southern side from where the dock is, that was not fenced. And so, stock used to get in the water, it was mainly sheep and over the years, I don't know how many sheep we'd rescue from there and throw them back because they could get down but they couldn't get back up and they'd die there. Now, with all that off there, they've replanted it, it's really good. And I think that's had an effect on the water.

Interviewee AA: Yeah. Yeah have you spoken to the farmers?... They did something, the farmers and the council... fenced it all off and replanted.

Interviewee AB: Pulled all the old trees out, because the lower trees were falling into the water. They pulled all those out and did all the planting and flax and natives along there. It's great.

Austin: Yeah it looks nice down there.

Interviewee AB: Yeah

Austin: How do you think the water quality could be improved in the area?

Interviewee AB: We've heard from the farms about them putting a pipe in through from the Ruamahanga River for irrigation. So they'd be able to take water out of the cutoff for irrigation. And if there's fresh water going in there, obviously it's going to make it somewhat better than it is. So any improvement is always going to be a bonus to us.

Austin: So I guess going off the irrigation thing, what are your views on the farmers potentially irrigating from the cutoff?

Interviewee AB: Well they do it sometimes. They're allowed to take whatever it is... I don't think it has any real effect on us.

Interviewee AA: Yeah, as long as it doesn't drop too low.

Interviewee AB: Yeah that's right, there's got to be a minimum level they can take from.

Interviewee AA: You'd have to calibrate the pipes to the river to send in more than was being taken out, I mean that'd be a good thing probably.

Austin: How deep is it in the middle of it?

Interviewee AA: What's it about three meters at the deepest?

Interviewee AB: Through the middle from where you saw the jump, down to... you would've seen a line of white buoys, yeah that's where we put our slalom course... and all through there is about 2 meters. You go out to the corner up towards the west when we drop down, it's four meters there...

Interviewee AA: A bit toward the road it's pretty shallow, like half of it would probably only sort of up to your shoulders.

Austin: What is your opinion on the current status of the wetlands next to that area?

Interviewee AB: So the wetlands are out toward the lake itself... is that what you're referring to?

Jena: Well I think just like wetlands and how they're used in general, like would you like to see more wetlands around the cutoff or just keep it the way it is or around the lake in general?

Interviewee AB: Well it doesn't really bother us, but I know they've done some work further up the lake itself there's wetlands in there and I think they've done some improvements in there. That's good for wildlife, that's great. There's no sort of swampy areas around where we are. They could probably do more further out towards the estuary.

Austin: What do you know about the Ramsar status of the lake?

Interviewee AB: Sorry?

Austin: Ramsar?

Interviewee AB: No...

Austin: It's basically like a, the Ramsar convention is this international body that is tasked with recognizing wetlands that have unique environmental aspects. And I think they're applying for Lake Wairarapa and all the surrounding bodies of water recognized by them. And I know there was some controversy because I know the farmers could potentially have ramifications from that if they were to disrupt the water quality. But, I mean you guys don't really, it may not pertain to you.

Interviewee AA: Yeah, how could that affect the water quality, you could only improve it couldn't you?

Austin: Well because they're trying to promote like a cleaner environment, some farmers feel like if something were to happen where they accidentally pollute the water or something, that there would be greater consequences in court.

Interviewee AA: Oh if the farmers were to... okay.

Austin: It probably doesn't apply.

Interviewee AA: Doesn't affect us really.

Austin: Aside from barefoot water skiing, how's the area important for recreational activities?

Interviewee AB: ... I think it's really important really, because the main Ruamahanga River, that diversion gets used a lot. Both from people that come from this side of the Rimatakasfixme and locals, it's always been used for skiing, camping, fishing. There's flounder and other fish in the river. 'Whitebaiters'. So there's lots of activity.

Austin: Are you aware of any conservation efforts regarding Lake Wairarapa?

Interviewee AB: I was aware that they did more for the wetlands sort of further north, there was some talk about that... Probably ten or more years ago there was a... paper put out calling for people who used the whole area of Wairarapa... as to its use. We did put a submission in that basically said we were there and we were using the cutoff. Were you aware of that? It's probably on regional council file somewhere... I don't think there were too many respondents to it and it was a generalized thing as well, I think the farmers were quite interested in it.

Interviewee AA: All the farmers around there seem pretty interested in having it all clean. They are looking out for the area that's for sure.

Austin: Do you think there needs to be more anti-pollution measures taken place?

Interviewee AB: In terms of trying to improve the water quality, I don't know whether the quality is as it is because of pollution, I think it's just natural. And the lake itself, I know the water quality is not the best, but it's a consequence of it's quite a shallow lake... There's lots of wind exposure and the bottom gets stirred up all the time. It'd be pretty hard to clean that up I think.

Austin: So what do you know about the Lower Wairarapa Valley Development Scheme? The flood prevention system.

Interviewee AA + Interviewee AB: No

Interviewee AB: I just know they open them up from time to time. It makes the river flow in... the lake.

Austin: So you don't know that much about the barrage gates then?

Interviewee AA: Yeah, when we're in there and the water level rides up I think 'the river's high' or 'the gates must be open or something' or there's been a lot of gate in which case I think, 'the gates must be shut.' How often are they operated?

Austin: They're operated automatically, so to achieve like a target water level in the lake.

Interviewee AA: And where's that measured, is that measured at the gates?

Austin: Yeah. So I know the lake the elevation of the lake can change up to a meter I think based on the wind, like from the east side to the west side. So I think they do measure right on the other side of the gates. So I guess you don't really know much about their operation, so you wouldn't have any technical recommendations, but as far as like the water levels, how could those be operated in the future I guess to better suit your needs?

Interviewee AB: Well that would somewhat depend on if the estuary was altered. At the moment the barrage gates don't really affect us... Only if there's a flood, it lets the water drain out a bit quicker, that's fine but most of the flooding is during the winter, we're not there often then anyway. So their operation probably doesn't affect us too much.

Interviewee AA: That'd be a tricky one because you wouldn't know until... unless that estuary got opened up, how the water level would be affected by the use of the barrage gates. I mean the water level at the moment's got probably 500 mm on [the lake]. Yeah I don't think you could afford to go much lower than that.

Austin: So what if the estuary wasn't there? What effects would that have?

Interviewee AB: I would think that would drop the level in the cutoff significantly.

Interviewee AA: Yeah, it would change a lot wouldn't it.

Interviewee AB: It would probably prevent us from skiing actually. I would imagine in places, the water would only be half a meter deep.

Interviewee AA: Yeah, yeah. It'd definitely be able to flood a lot more too.

Austin: So keeping the estuary there is very important?

Interviewee AA: It is probably yeah. Otherwise, if it wasn't, you've got to really be monitoring the whole time.

Jena: Would you want to change anything about the estuary? Besides definitely keeping it there?

Interviewee AB: No, it's huge, I've only ever been out there a couple of times because it's a long way from where that dock is, and it's another three kilometers. And when you get out there, you don't realize just how vast it is. So, to make any changes to it would be enormous. At the moment we go out and it becomes too shallow to be on it... we've got a pump boat that operates in really shallow water. We got to a point where you couldn't go any further and we walked 500 meters and we were still probably at least 500 meters from the lake. So to make any changes to the estuary would be significant. And there's all... lots of vegetation... trees, so it'd be a massive job. Unless it was just a channel cut, but I'd rather see it the way it is.

Austin: That'd be pretty detrimental to the barefoot water skiing?

Interviewee AB: Yeah if it was going to affect the level of the cutoff.

Interviewee AA: Yeah I mean there could be times when there's no water in there at all pretty much.

Interviewee AB: I guess if the water went down that much, then the fish and the wildlife would be affected.

Austin: How much do you think you benefit from day to day operation of the LWVDS?

Interviewee AA: Well it's... I mean with it being there, we've been able to ski. I mean we've had a few world champions and well heaps of national champions and we just wouldn't have those people in the region if it wasn't for... yeah there is one other lake in Wellington where people can train and ski, but it's a rather manmade lake.

Interviewee AB: I guess if the barrage gates weren't there, the diversion wouldn't be there and where we are would be the river flow and it just wouldn't be suitable.

Austin: So any river with a flow in it isn't ideal?

Interviewee AA: Not ideal. No.

Interviewee AB: Minimal flow is okay but not normal flow. Even the Ruamahanga River which is a very slow moving river, we couldn't put a slalom course in there and you couldn't hold their barefoot jump. Because you get logs, other debris coming through.

Austin: Are you aware of the funding plan for the operation and maintenance of the barrage gates?

Interviewee AA + Interviewee AB: No

Austin: So essentially, it's like the landowners around the region contribute based on how much they are protected by the scheme every year and I think the Greater Wellington Regional Council also pays in.

Interviewee AB: So the farmers around the lake are levied on what they, I didn't know that, I just thought it would be a regional thing that was paid through your rates.

Austin: I guess it is kind of... they put that into their rates, but it's based on how much they benefit from it.

Interviewee AB: Well if I was a farmer, I'd have a bit to say about that.

Austin: So what are the overall advantages of the overall setup of the whole system are to you guys?

Interviewee AB: The cutoff or the whole region?

Austin: Just the whole way the water system plays out down there.

Interviewee AA: It works for us the way it is.

Interviewee AB: It works for us, it's ideal for us. We'd like a few more trees and things to give us a bit more shelter from the wind. Because we used to have, just west of where the dock is... a big stand of pines and they actually gave us a lot more shelter than what we've got now. In 2004,

we had a big flood and the following weekend we had a windstorm. Quite a few of those trees blew down, even though they weren't due for harvesting the council decided to take a few down. That exposed us to floods quite a bit. That windstorm was just incredible. I went over there for the day and was driving down, you could see water spouts coming off the lake and that was kilometers away. I mean we got to where the dock is and you couldn't stand up. There were 1 meter waves coming down the cutoff. Amazing.

Austin: So I guess that would be one of the disadvantages of the current setup? Is that they don't have enough vegetation?

Interviewee AB: Yeah I suppose. Vegetation gives us shelter, there was talk of them. There was talk of what they've done on the south side, which is take all the trees out and planting, they talked about doing that as on the same side as where the dock is. They've done part of it at the eastern end, but if the wall has to go, we'll be exposed... The trees and other vegetation are important to us.

Austin: What other disadvantages are there with the current setup? Like are there any other problems, problems that could be mitigated?

Interviewee AB: No, I don't think there's anything really that we can say where 'the effects of this would make it better' but, not at all.

Interviewee AA: It's just more trees...

Austin: If there was one thing you'd like to see going forward about the management of the area what would it be?

Interviewee AB: I suppose if we had a wish list, if you could get rid of the green in the water that would be great.

Interviewee AA: Cleaner water would be fantastic, but it's fine, no one's ever been sick from it so... yeah if it was cleaner then the farmers could use it.

Interviewee AB: Do you know how much they're allowed to take out of it for irrigation? Is that part of your study?

Austin: We don't know exactly how much.

Jena: I think it depends on, which farmer.

Austin: Because they each have to get their own water take permit.

Interviewee AB: Right, so I guess a.) as to how much they can take and b.) below a minimum level, they can't take.

Jena: There's definitely regulations on how much they can take, I'm not sure what it is, but there are regulations and they are...

Interviewee AB: It'd be interesting to know what the water level limit is, because as far as I know it's only Mike that takes water out of it.

Interviewee AA: There's one sort of right on the corner... taking water... I know that's not his farm there. So I'm not sure who that is.

Interviewee AB: I don't think they've had that pump going...

Interviewee AA: Yeah no, that was a couple years ago.

Austin: So what's really the lowest water level that you can tolerate I guess?

Interviewee AB: Probably 500... probably 300 below where it is now...

Interviewee AA: Yeah that ought to be down about where it was a couple years ago when it got lower, yeah there were other logs that we didn't know were there and hit them. It's real shallow in some areas.

Interviewee AB: Is it 300?

Interviewee AA: Yeah, if it was a meter, we'd be buggered. Completely buggered.

Austin: How many people are part of the barefoot waterskiing club?

Interviewee AB: I think that number would be... 10-12?

Interviewee AA: Yeah

Interviewee AB: Plus we have a few others who we invite them, they're not members of the club, they can only come here if we're with them.

Interviewee AA: Yeah, I've got one of the New Zealand champions coming this weekend from up Waiko area, sort of coaching him so. We have a few others that sort of join us.

Interviewee AB: So in terms of people, a total of 20 have access to skiing there but it's through us. So they can only obviously be there if one of us is there.

Austin: This question is kind of for my own curiosity, how do the tournaments work?

Interviewee AB: Well barefoot is a bit different to you know slalom skiing...

Interviewee AA: Yeah, barefoot waterskiing. You have three different events, trick event, slalom event and jump. So like you saw the jump in the water there, that's measured off distance... an average jump is around 10 meters sort of thing. An advance jump is sort of 20-26 meters... The trick is, you have two 15 second passes, that's what's great about that water there. You have probably 25 seconds of straights... It's just a perfect lane for training. So tricks, it's just certain turns or flips or... as many tricks as you can in 15 seconds, you get scored on points based on the difficulty of the tricks. Slalom is two 15 second passes again and it's the number of crosses you do on the lake in 15 seconds.

Interviewee AB: In tournament skiing, we have a course in the water which has an entry gate and then six turn buoys... you get up to speed, about 55 kph. If you can do that we shorten the rope, so each pass gets harder basically. We do trick and jump as well, but we don't do that here, we've got no jump set up, our jump in tournament skiing is a massive thing.

Austin: So do you basically have the same needs as far as water levels and everything?

Ian + Interviewee AA: Yep

Austin: That doesn't change based on what you're doing?

Interviewee AB: No

Interviewee AA: There are a few international tournaments around where they've got barefoot and the tournament skiing together at the same thing. And you've got a lot of those manmade ski lakes are perfect for tournament and barefoot.

Austin: So that's really all the questions we have, but if there's anything else you'd like to just tell us...

Interviewee AA: There's another guy that's been in the club for a long time as well. Ross Linton, he lives in Greytown, in the Wairarapa. He was real keen to come, but he just couldn't get over here away from work... I'll give you [his contact information] because I think he knows... Ian [Gunn]...

Austin: So the operation of [the gates] is kind of fine right now?

Interviewee AA + Interviewee AB: Yup

Austin: So that's all we really have right now, thanks.

Interviewee AA + Interviewee AB: Yup

C. Interviewee AC

Interviewee AC: ...and basically it's a training ground for us. Also, we have a jump in there, you guys have seen the jump?

Jena: Yeah

Interviewee AC: We can't put one of those in the main river because the main river floods so it would just get swept away. So yeah, mainly for training purposes and a little bit of recreational skiing.

Jena: When you say 'we' how many people do you have...?

Interviewee AC: Umm... like on Monday we had 14 people down there skiing.

Jena: A decent amount! What would you say that you value most about the water system?

Interviewee AC: The fact that there are a few rules and regulations on that waterway. There's only allowed to be two boats on that water at any one time and only one moving at any one time. So basically with training you need flat water. So basically if you've only got one boat moving at one time then you've got flat water. So, that's the best thing, that it's isolated basically. Some people don't want to ski in that water because it gets a bit grubby at times. But they guys that want to train, they can't do it on the main river.

Jena: What are your thoughts about flooding?

Interviewee AC: In the sense that it doesn't really flood in that river because it's cutoff, which is why we can actually put in... a jump. So that doesn't really flood, but of course it's controlled by the barrage gates, so we don't actually get flooding in there.

Jena: So, the water levels will rise, how does that affect water skiing at all?

Interviewee AC: Umm, it does effect the water way, but only because of the back wash. The wake of the boats and hits the banks. When the water level gets higher, it hits straight banks and it just bounces off the. You actually create rough water. So when it's high, we have to do a run through it, sit there and wait two minutes before we can go back through again.

Jena: Could you say that flooding is well managed then?

Interviewee AC: Yes, I would.

Jena: What do you think of the target water levels either in the cutoff or the lake?

Interviewee AC: That's governed by the sandbar where it goes into the lake, isn't it... So when the lake goes lower than that sandbar, the cutoff still stays at that level. That's just a natural phenomenon that's happened, that that sandbar's there.

Jena: How are fish important?

Interviewee AC: They're not really important to us because we're not fishermen. There are fishermen that go down and fish in that water. There used to be a lot of people that fished in that water, but they seemed to have disappeared now.

Jena: Do they affect you in the cutoff at all?

Interviewee AC: No

Jena: What about the birds?

Interviewee AC: There are heaps of them and we do try and keep out of their way. Most of the time... we don't interfere with each other. But there are times when there are so many swans in that pond that they do fly away when we come through with the boat. We keep away from there in their nesting period or when there are young ducklings around.

Jena: What do you think of the water quality of the cutoff?

Interviewee AC: It does vary. When the lake does go high, which is normally when the mouth Lake Onoke closes and the whole lot is high, water does go into there and it does flush it out quite a bit. But generally, it's not that nice.

Jena: Do you think farming has an effect on water quality?

Interviewee AC: It does, but now that they've fenced it, I think it's better than what it used to be when... We used to have cows literally in the water and along the banks and just out in the

shallow water. Obviously they were doing their excreting and things in there. I think the water, since they've fenced it, has definitely improved.

Jena: How else do you think water quality could be improved?

Interviewee AC: There was talk of the farmers getting resource consent to take out irrigation water. But to do it, he had to replace the water that he takes out. Do you know anything about that?

Jena: Not sure...

Interviewee AC: And they were talking about putting pipes under the road to the Ruamahanga River. And whatever he took out he had to replace, if that did happen that would clean the water up quite a bit because then you've got water going in there all the time. Sometimes when the lake's low and that sandbar stops water from going either way, it can be months and the water is very stagnant. So, obviously it's not so fresh. But nobody that we know of has ever gotten sick from that water.

Jena: What do you think of irrigation from the cutoff?

Interviewee AC: If they were going to do what they said they were going to do and replace the water that comes out then I think that would be a really good thing. If they don't replace the water that comes out, we will run out of water. So that's kind of important for us.

Jena: So what is your opinion on wetlands?

Interviewee AC: I'm all for them. So many have been taken away and when that scheme was first put in, a lot of wetlands were taken away. I'm all for them.

Jena: Do you know about the Ramsar status?

Interviewee AC: That's who sorry?

Jena: Ramsar?

Interviewee AC: No.

Jena: So basically it's an international that gets put on wetlands and they get internationally recognized and apparently there's people who on their bucket list want to go visit these Ramsar status wetlands. And, then they also get funding from the government, I'm not sure if it's the GWRC or the SWDC but they get special funding for having this status to upkeep the wetlands or stuff like that. So yeah, that was just a question.

Interviewee AC: Is that whose cut those trees on the one side and planted all natives and trees on the south side of the cutoff?

Jena: Probably not the same thing. I know that some of the farmers are starting to put in their own wetlands. But this is just a status that the GWRC would apply to, because right now they do qualify for it, but they have to get consent from the community and that's what they're debating whether they want to go through with it or not.

Interviewee AC: To make that a strictly a wetlands area?

Jena: To put this Ramsar status on that.

Interviewee AC: Ah okay. Would that affect us in the sense that we might get kicked out of there?

Jena: I don't think so, most of the farmers are worried about more regulations like if they're trying to put in a drain or clean their drain, if they do something wrong it might be double the punishment... that's what they're scared of because there already are regulations and they're really trying to follow those, but sometimes they're worried that if they get this status there might be more consequence.

Interviewee AC: Right...

Jena: Anyways, besides the barefoot waterskiing, how is the water system used recreationally?

Interviewee AC: There are fishermen. Every now and then there's a group of waka rowers that row the waka boats, you know about them... They mostly train at a lake in Masterton, but every now and then when the water quality gets too bad, they aren't allowed to use that lake, so they come and get a key off me and use that lot. That's probably the only ones that use it. There used

to be a guy that did canoe tours around the area... Kahutara Canoes, it's called. And they, when the main river's in flood, obviously they can't use it, so they used that stretch of water as well. Yeah the canoe tours...

Jena: But he doesn't do that anymore?

Interviewee AC: I'm not sure. I haven't seen him there for a long time, but whether that's just because the river hasn't been in flood for a long time, I'm not sure. Like I haven't seen him for probably two years, there are a couple rowers...

Jena: Are you aware of any conservation efforts?

Interviewee AC: ... Like, we are not supposed to use that water way between Easter and Labor Weekend for breeding and things like that.

Jena: Do you think that more anti-pollution measures need to be taken?

Interviewee AC: It would be nice. But, what people are saying is that having those boats... using the water actually does clean it up... So in a way we're doing quite a bit of anti-pollution work. Do you think?

Jena: There you go! How much do you know about the Lower Wairarapa Valley Development Scheme?

Interviewee AC: I knew a lot about it when it was happening. Mainly because my father worked on it and my uncle worked on it. As a little kid I used to go look at it.

Jena: What would you say are some advantages and disadvantages of it as it pertains to you or the community?

Interviewee AC: I don't see any disadvantage of it. It certainly does what it was planned to do, which was to stop that lake flooding and they reclaimed quite a bit of land out of that. So, no, I don't see any disadvantages.

Jena: So besides the flood control are there any advantages?

Interviewee AC: Well the flood control and the recreational activities that can be held down there, not the cutoff, the actual Ruamahanga River, that's a great place to ski.

Jena: How much do you know about the barrage gates just like separately?

Interviewee AC: Not a lot really, I mean I know what they do and how they work but I don't know who actually controls it and how they control it.

Jena: Well the GWRC controls it and then they're updating a lot of their technology so it will all be remote and up to date and better than it is now. That's one of the big improvement projects they're going through right now.

Interviewee AC: Alright.

Jena: So can the water levels be changed to better suit your needs?

Interviewee AC: If it gets too high, we get a back wash. If that sand bar was taken away from the entrance that would probably affect us because I think we would probably run out of water. Because sometimes the lake gets quite a bit lower than the cutoff. If it was slightly higher where water from the lake was going into there all the time, I think that would benefit us in the sense of water quality...

Jena: How much would you say that you benefit from having that cutoff and having the flood prevention scheme in place?

Interviewee AC: We've had three world champions down there and quite frankly if they didn't have that waterway, they wouldn't have been world champions because they just haven't got the water around this area to train. I heard you meant Bevan's little kids. They are going so well with it. Hopefully one day, they'll be world champions. They're going very well with it, they are very good little skiers... If they can keep progressing the way they are and have that waterway to train on, then you know, they could one day be world champions, hopefully.

Jena: So if they opened it to the lake, would it or would it not be good?

Interviewee AC: It depends on the level, if it dropped it right down, because there are still logs sitting in that water way and some of them don't bother us until the water gets down to a certain level. Yeah, if it went down too much, it wouldn't be a great place. But if it went up a little bit, it wouldn't worry us. But then, that would affect the farmers around the lake wouldn't it, if that went up.

Jena: I mean if there was a way to have the lake levels flow enough but still have enough water in the cutoff, that'd be ideal... whether or not that's feasible that's not for us to decide.

Interviewee AC: Have you seen the footage of it when it does flood here?

Jeff: We've seen pictures.

Interviewee AC: Yeah, and it floods badly. There's a lot of water that ends up down there from these hills. Yeah so to keep it at a certain level would probably be impossible. I don't know, you're sort of run of the mill type months, it would be fine, but once the winter comes and you get all that water coming through it would be hard to keep it at a manageable level. That's why they built this spillway as well. I mean that spillway gets used quite a bit too.

Jena: Are you aware of like the funding plan for the scheme at all?

Interviewee AC: No

Jena: I mean if you want to know, some of the landowners around the lake pay extra rates to the GWRC and they end up paying for 50% of the budget collectively and the GWRC pays for the other 50%... What are the current advantages and problems of the current situation at the cutoff?

Interviewee AC: We actually quite like it. The way it's running, I mean obviously, when you get too much water in the lake, when it floods or when the mouth is closed, it's obviously going to get higher. That is a disadvantage at times, but I can't see any way around it. And of course if the mouth is closed, they have to wait for it to get to a certain level before they actually open the mouth so that it blasts a hole through it. So that's a bit of a disadvantage when it closes, but I can't see any way they can stop that natural thing from happening.

Jena: If there was one thing forward you could change... about the management and how they operate the gates and the cutoff, what would it be?

Interviewee AC: I don't know that there's a lot they could do that actually changes us except for the fact that they can let a lot more water in, but that would probably upset a lot of the farmers. Yeah, I don't think they can raise the level too much more. But it would be nice... about a foot would be nice.

Jena: So, I think that's pretty much all we have but we're relaying all this information to the GWRC so if there's anything else that we didn't mention. Or something else that we didn't say but still pertains then that would be useful for them to know...

Interviewee AC: Right... So who's your sponsor?

Jena: GWRC, well Ian Gunn specifically.

Interviewee AC: Ian Gunn? Or Bucannon?

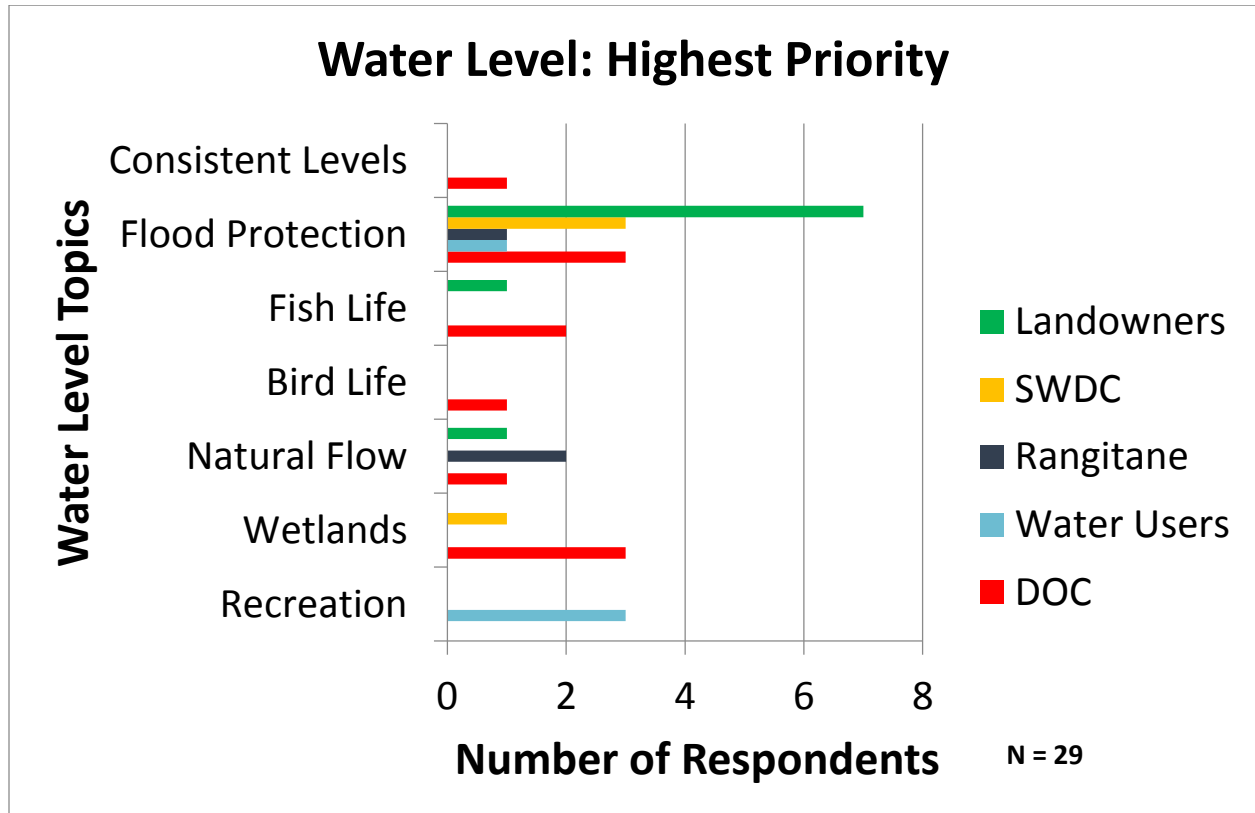
Jena: Gunn, he works for the GWRC. But I think that's all I have. Thanks.

Interviewee AC: Yup.

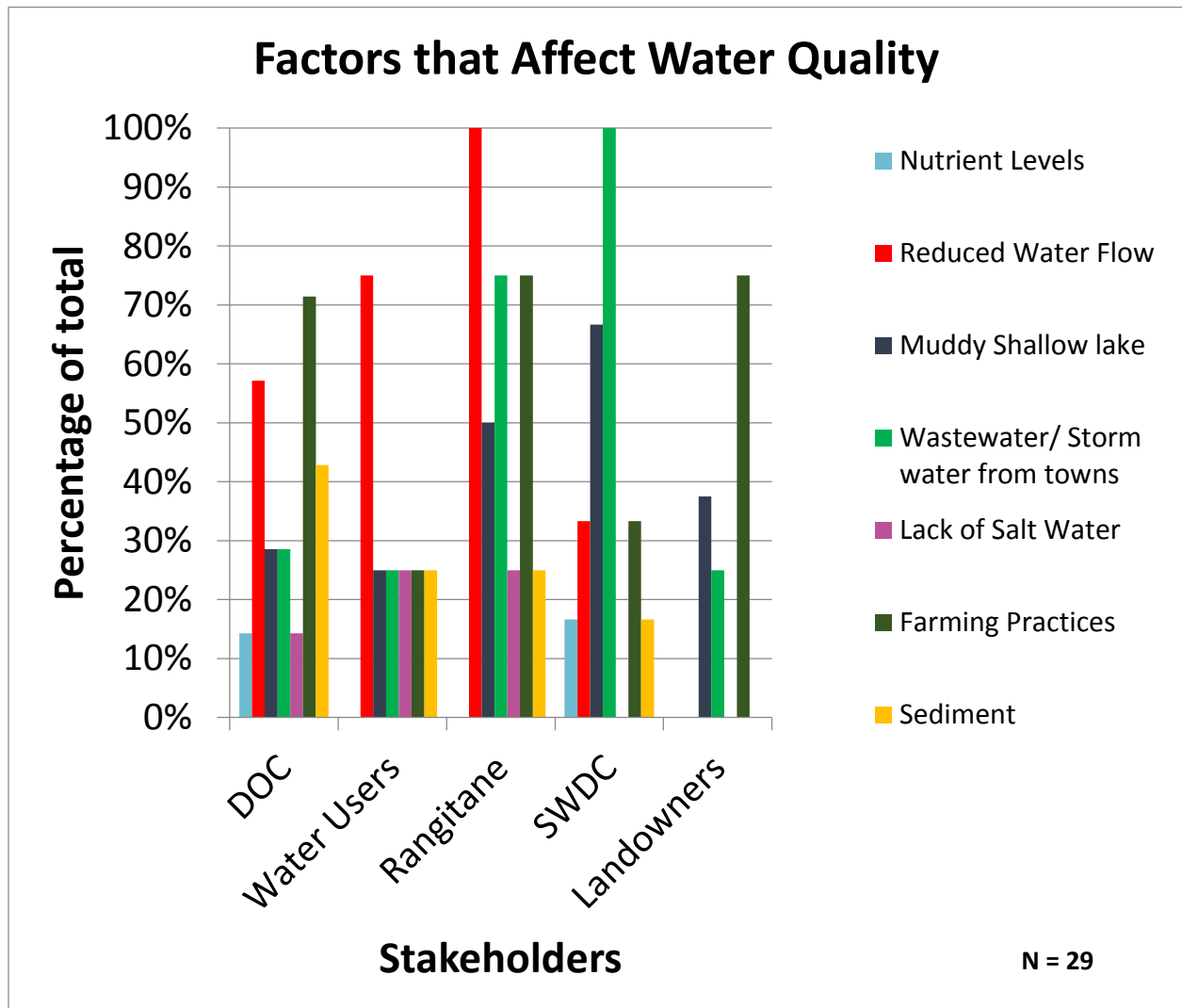
Appendix F – Additional Graphs

The following bar graphs provide a different perspective than the images in our analysis section. Note some of these graphs are difficult to read.

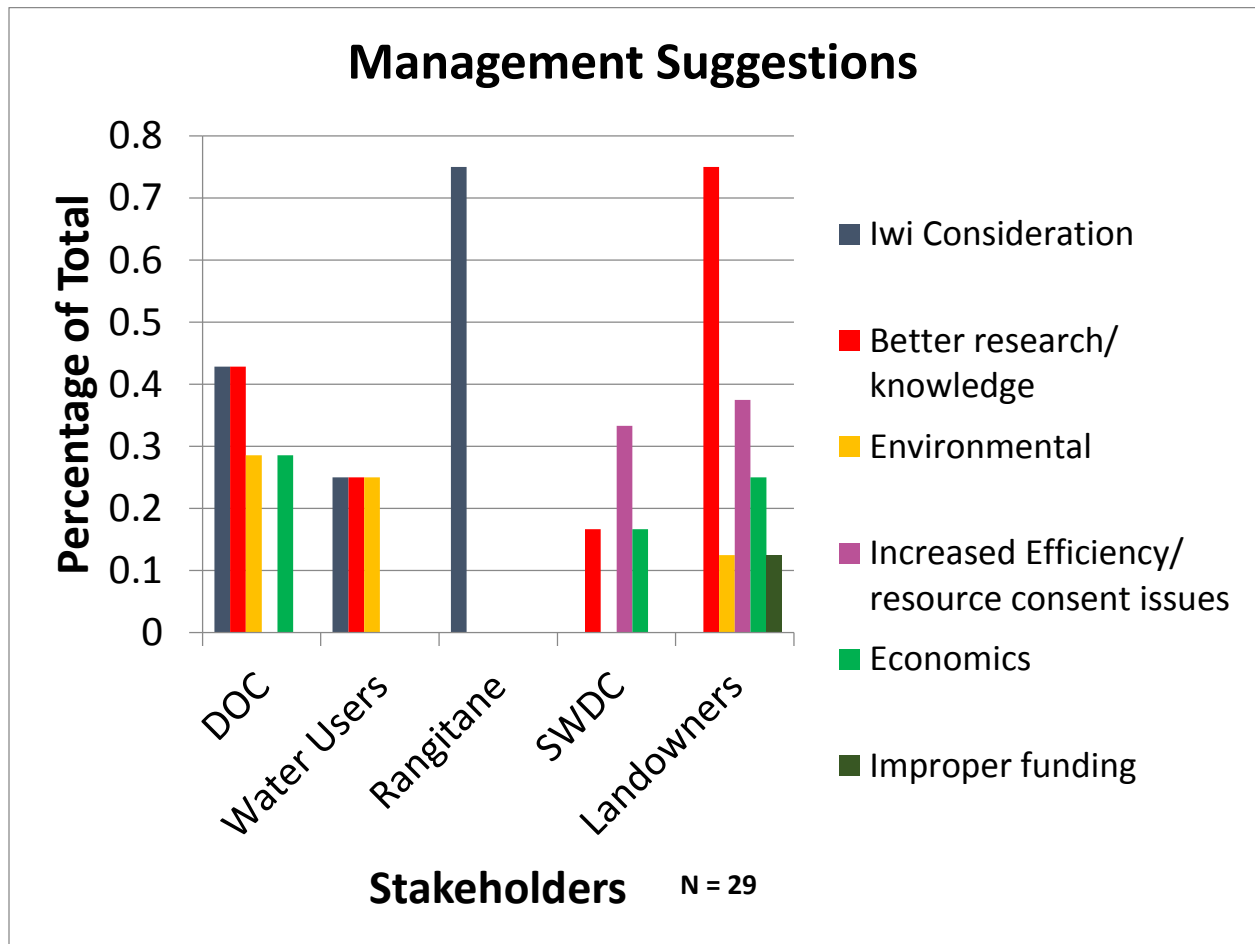
F.1 Water Level Bar Graph



F.2 Factors That Affect Water Quality Bar Graph



F.3 Management Suggestions



F.4 Barrage Gate Bar Graph

