Pest Fish Management in the Waikato Region

An Implementation Plan for Waikato Regional Council and Department of Conservation 2018-2021

Department of Conservation
Te Papa Atawhai

Waikato
REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

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Michelle Archer

Angus McKenzie

This report was authored by Michelle Archer of Place Group Limited. The following people kindly contributed to the report by agreeing to provide information to the author:

Waikato Regional Council staff: Brett Bailey, Patrick Whaley, Paula Reeves, Mike Lake, Bruno David.

Department of Conservation staff: Natasha Grainger, Ray Scrimgeour, Ray Tama.

Auckland Waikato Fish and Game staff: Adam Daniel and David Klee.

NIWA: Cindy Baker.

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EXECUTIVE SUMMARY

The Waikato Region has all known species of pest fish in New Zealand present in its waterways, particularly in the Waikato River Catchment. The areas that already contain widespread infestations are (currently), nearly impossible to contain or eradicate. However, there are waterways that do not contain pest fish and where possible interventions can still be undertaken to ensure they stay pest fish free.

Waikato Regional Council (The Council) and the Department of Conservation (DOC) both have legislative responsibilities in regard managing the impacts of pest fish. However, due to significant legislative cross over in these responsibilities there exists misunderstanding in the respective agency roles, such that it is often not well understood by staff, managers and the community. It is apparent that should an incursion occur at a new and significant site, there is no structured surveillance to understand when an incursion has occurred or processes in place to assist MPI with the event. Responses to incursions to date have been adhoc and a lack of understanding around the significance of a site could result in wasted resources if incorrect management was to occur.

Both organisations are undertaking long term management activities within the Waikato region; however, there is a lack of consistency on why a site is selected or not, significance of a site and effective planning and communication of the long term objectives of the project.

Recognising these factors, this report sets out the following:

1. Identifies the key species of pest fish in the Waikato Region;
2. Discusses gaps in interagency coordination, incursion management and potential tools;
3. Clarifies the statutory roles and responsibilities of the Council and DOC (and its key partner agencies) in relation to the management and control of pest fish;
4. Set outs implementation workstreams and actions for the next 3 years for both agencies to coordinate effective, interagency pest fish management;
5. Recommends a management structure and resource requirements to oversee and deliver the actions identified.

The project team recognises that there are short and long-term objectives in regard to pest fish management in the Waikato Region. This implementation plan is intended to focus on the short term actions required in the next three years.

1 INTRODUCTION

Invasive freshwater fish are found throughout the Waikato Region's lakes and rivers. Their presence threatens native freshwater indigenous biodiversity and adversely impacts water quality.

In the last 20 years, there has been a dramatic increase in the spread and abundance of invasive fish in the Region's waterways. Overtime, this has resulted in an increased community expectation on both the Department of Conservation (DOC) and Waikato Regional Council (the Council) to implement more effective control measures against pest fish.

Whilst both DOC and the Council have implemented several one-off projects in response to the growing problem, there has been a notable absence of any well-funded co-ordinated and/or efficient approach to controlling the ongoing spread. There is also a limited understanding of the spatial extent of pest fish and no definitive prioritisation to determine the best use of limited resources. Potential management tools already have visibility in the community, including biocontrol tools, however there has been no formal commitment to pursue the use of these in the Waikato Region.

During production of this report an identification and ranking tool has been produced to assist in prioritising action in lakes and waterways in the Waikato Region. This tool requires joint workshopping to finalise and has been included in suggested workstreams.

1.1 Implementation Plan Purpose

Recognising the issues noted above, the purpose of this plan is to address the current management gap by setting out a collaborative 3-year implementation programme for the Council and DOC that will seek to address the impacts of pest fish in the Region in a co-ordinated way. To this end the plan:

1. Identifies the key species of pest fish in the Waikato Region;
2. Summarises the key gaps in interagency coordination, incursion management and potential tools;
3. Clarifies the statutory roles and responsibilities of the Council and DOC (and its key partner agencies) in relation to the management and control of pest fish;
4. Set outs implementation workstreams and actions for the next 3 years for both agencies to coordinate effective, interagency pest fish management;
5. Recommends a management structure and resource requirements to oversee and deliver the actions identified.

1.2 Plan Audience and Scope

The primary audience for the plan is Waikato Regional Council and DOC staff seeking to address problems with the spread and abundance of pest fish.

The development of this plan has been initiated by the Council to identify the key pest fish issues in the region, clarify roles and responsibilities, provide an analysis and proposed ranking of waterways to assist in focusing effort and resources.

During the planning and research for this plan, it was recognised the need to clearly outline roles and responsibilities. In addition, the problem of invasive pest fish is so large it is hard to know where the responsible organisations should focus their effort and limited funding. Both the Council and DOC have

regulatory responsibilities for pest management. This plan defines these responsibilities to assist staff in understanding their role. This Plan also clarifies the Councils responsibilities for:

a. New incursions (to New Zealand and the Region);
b. Management of existing populations;
c. Supporting the Department of Conservation

The Council and DOC have limited budgets for the management of pest fish. While reviewing the information and discussing the project with Council and DOC staff, it was evident that no resource existed that informed staff which waterways have invasive pest fish and which ones didn't. It is difficult to grasp the scale of the work required without understanding where pest fish invasions are and agreeing on the highest priority areas for management.

As a result, a newly developed Pest Fish Prioritisation Tool (detailed in Attachment 1) has been produced, designed to sit alongside this implementation plan. This provides up to date data on all relevant waterways in the Waikato Region. This tool is a quick reference useful for determining presence of pest fish in the case of suspected incursions and could be utilised for determining the management criteria and the actions each organisation will take in regards to pest fish management. It is anticipated that this tool requires further technical input.

In addition to waterway specific projects, actions are provided to investigate the need for other management tools designed to monitor, halt the spread, manage or eradicate pest fish populations. Specific infrastructure, or other projects associated with the waterways in the Waikato Region and as identified by the Waikato and Waipa Rivers Restoration strategy are also detailed in the Priority Ranking Table.

To date there has been limited coordination between the various pest fish initiatives in the Waikato Region. This plan provides a management structure to deliver enhanced outcomes for pest fish management in the Waikato Region.

Matters that are out of scope for this plan include:

- Detailed pest fish species descriptions.
- Recommendations of species management and detailed description of eradication tools.
- Recommended research to progress understanding of pest fish population dynamics.
- Management of non-fish pest species such as turtle and newt.
- Specific organisational responses to a new fish species incursion.

1.3 Methodology and Assumptions

This plan is intended as a high level, factual review of the status of workstreams and projects regarding invasive pest fish in the Waikato Region. This included working with the key staff associated with pest fish management in both organisations to review the work underway, discuss gaps and explore opportunities. This work assisted in determining both a starting point and potential priorities for management.

This analysis has guided the implementation actions and a recommended management structure for Waikato Regional Council and the Department of Conservation to agree on and obtain the appropriate funding to implement.

During the plan production, the need for a simple prioritisation tool was identified. It included a collation of all available data into an excel spreadsheet to determine the location of specific species in waterways across the Waikato Region to produce the Pest Fish Prioritisation Tool (Attachment 1). To assist in determining priorities for management, this simple tool includes information on significance, be it ecological, cultural or simply whether a waterway is currently pest fish free.

This information is intended as an evolving database accessible to those requiring it and controlled to ensure the most up to date information is contained in it, for example updated following monitoring. This database will be a useful tool during potential pest fish incursions by providing a quick reference to staff on which lakes are currently known to have pest fish.

2 PROBLEM DEFINITION

2.1 Pest Fish Species

The Freshwater habitats in the Waikato Region (the Region) are at ongoing threat from the impacts of invasive freshwater pest fish. The Region has all known species of pest fish in New Zealand residing in its waterways, particularly in the Waikato River Catchment.

Seven species of introduced fish are resident in the Waikato Region; koi carp, *Cyprinus carpio*; perch, *Perca fluviatilis;* brown bullhead catfish, *Amieurus nebulosus*; gambusia, *Gambusia affinis*; rudd, *Scardinius erythrophthalmus*; tench, *Tinca tinca* and goldfish, *Carassius auratus*. It is noted that perch, rudd and tench are under the jurisdiction of Fish & Game NZ and not present in all waterways in the Waikato Region. To prevent their spread, provision is made under the RPMP for their eradication in conjunction with Fish & Game and DOC should they appear in a waterway where they have not been legally authorised (WRC RPMP, 2014).

Further detail on the invasive pest species and their effects on waterways and native biodiversity can be found in the following documents:

- New Zealand Invasive Fish Management Handbook, published by The University of Waikato and the Department of Conservation in 2015; and
- The Waikato Regional Pest Management Plan (2014-2024).

Attachment 2 provides a summary of invasive pest fish objectives and policies in iwi maangemnet plans within the Waikato Region rohe.

2.2 Pest Fish Management Coordination

DOC and the Council have implemented several one-off projects in response to the growing pest fish problem. However there has been a notable absence of any dedicated funding, co-ordinated and/or efficient approach to controlling the ongoing spread.

To date most work in the Waikato Region has either been surveillance and monitoring to understand indigenous and invasive pest fish species and research with a general focus on assessing potential management tools.

The lack of coordinated management actions is a result of:

- A lack of understanding of roles and responsibilities.
- projects with a research focus at lakes not of high priority, or at a scale to actually control or eradicate pest fish;
- lack of funding, and no clear indication on where the best “bang for buck” can be achieved;
- still researching and building knowledge of how to control pest fish; and,
- best practice being unclear.

In the Waikato Region there are currently waterways that do not contain pest fish. There is significant opportunity to ensure that the Council and DOC, along with other parties, can work collaboratively and ensure that the spread is stopped (where possible) and potential interventions undertaken to ensure they stay pest fish free. Projects where interventions could be undertaken have been identified and included in the Prioritisation Tool (Attachment 1), with approximate costings where available.

It is accepted that the areas that already contain widespread infestations are difficult to manage and further work is required for other species management tools that could assist with eradication. Most waterways are significant to local iwi, the community, DOC and the Regional Council; however, these many (sometimes competing) interests and the wealth of information makes it difficult to determine which are the priorities for the limited funding available and where ongoing management has an impact on native species and waterway recovery.

Inevitably, incursions to new sites will occur. Ongoing management includes ensuring the appropriate documentation, tools and support are available to support the Ministry of Primary Industries (MPI) and DOC when this occurs.

In addition, appropriate surveillance is required and must take into account new technology and methods to detect unwanted species in waterways.

3 ORGANISATIONAL CONTEXT

3.1 Statutory Drivers

A summary of the legislation which drives invasive pest fish management in New Zealand and who this is administered by is provided in Table 1.

Table 1 - Invasive Pest Fish Management Legislation and relevant organisations – *modified from the New Zealand Invasive Fish Management Handbook, 2005.*

Legislation	Responsibilities
Biosecurity Act 1993	Ministry for Primary Industries - Lead agency charged with managing biosecurity risk. Amended in 2012 to enable Regional Council role in management via RPMP. Act expects the regional councils will lead the prevention, reduction or elimination of harmful organisms.
Freshwater Fisheries Regulations 1983	Department of Conservation and Fish & Game New Zealand Councils – Controls related to management and movements of live aquatic life. Part 8A deals specifically with koi carp, including the establishment of the containment area (Figure 1) which allows for the control/management of koi carp within it and eradication (if possible) outside.
Conservation Act 1987	Department of Conservation – Responsible for the management of established invasive freshwater fish species; preserve indigenous freshwater fisheries (as far as practicable); protect recreational freshwater fisheries, and; protect freshwater fish habitats. Ministry for Primary Industries – Movement and transfer of species. Fish & Game - Manage sport fishery.
Fisheries Act 1983 and 1996	Ministry for Primary Industries – Use and sustainability of freshwater fisheries resources (including eels) except sports fish, whitebait and unwanted aquatic life. Department of Conservation and Fish & Game Councils - Both may need to provide approval for transfers.
RMA 1991	Regional Councils and Local Government - Maintain indigenous biodiversity.
Imports and Exports (Restrictions) Act 1988	Environmental Protection Agency – Regulator
Hazardous Substances and New Organisms Act 1996 ('HSNO')	Environmental Protection Agency - Regulates import of new organisms. Ministry of Primary Industries - New organisms not yet present in New Zealand.
The New Zealand Biodiversity Strategy (DOC & MfE, 2000)	Identifies Department of Conservation and Regional Councils as the lead agencies to achieve the following Objective - *"Prevent, control and manage plant and animal pests that pose a threat to indigenous freshwater biodiversity".*

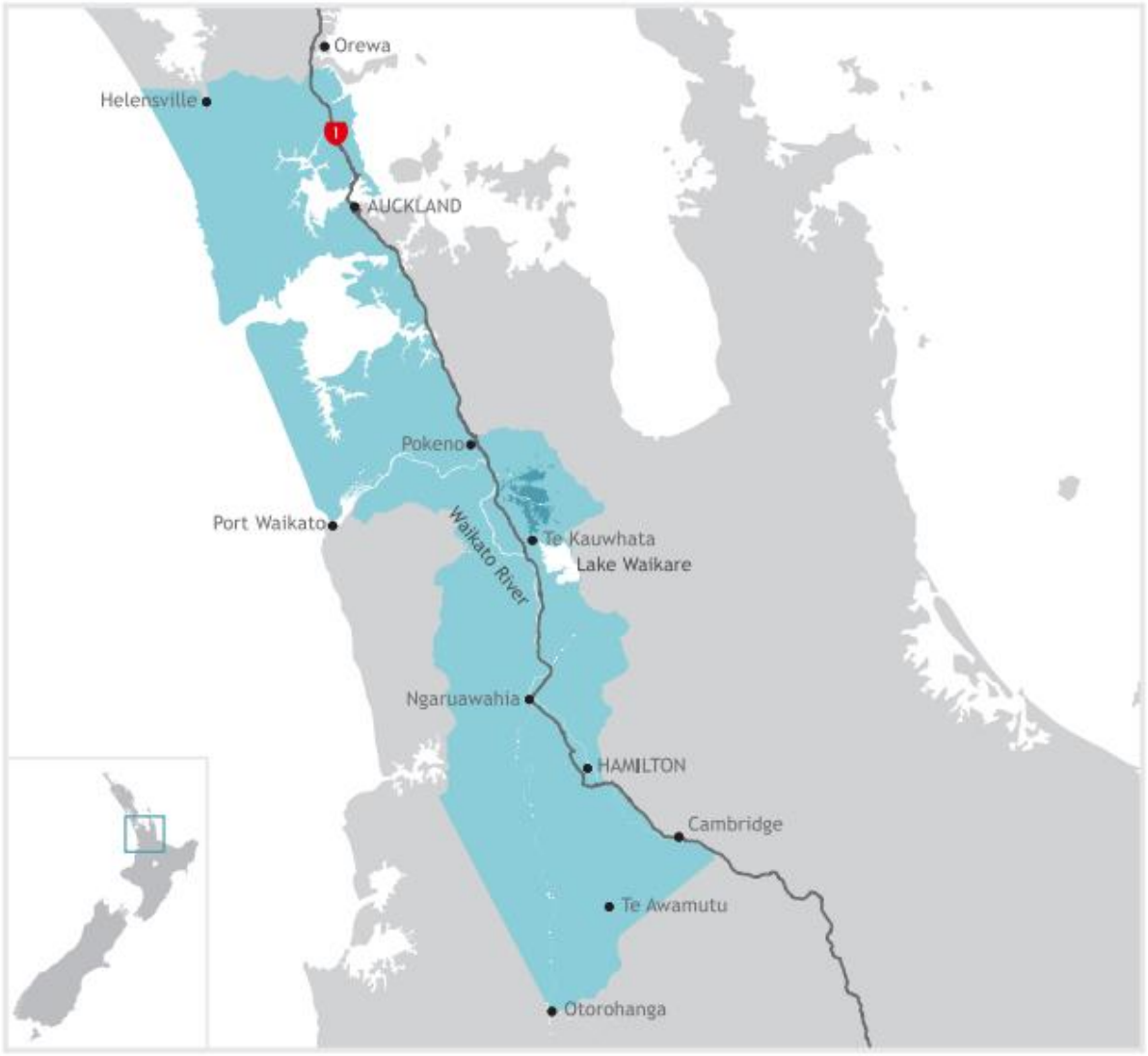

Figure 1 – Koi Carp containment area (New Zealand Gazette 1990). *Source New Zealand Invasive fish management handbook, 2015.*

3.2 Roles and Responsibilities

The roles and responsibilities are defined in the relevant legislation and set out in further detail in plans such as the New Zealand Biodiversity Strategy and in the detail of Regional Pest Management Plans.

The Regional Pest Management Plan specifies (section 11.6) 'site led and integrated pest control at high value biodiversity sites and high value catchment sites". Most relevant for pest fish are the "high value biodiversity sites" – areas identified by the Council as "containing indigenous vegetation or habitats of indigenous fauna that meet one or more criteria in section 11A of the RPS" (provided in Attachment 3).

Preserving waterbodies currently in pristine condition, namely free of invasive pest fish is a high priority and also a requirement of the Council under the Regional Pest Management Plan. The prioritisation tool provided in Attachment 1 will assist the Council in determining areas of significant indigenous biodiversity.

There are varying levels of pest fish management, which have individual requirements of the organisations responsible for management, particularly during new incursions.

With regards to pest fish management, Figure 2 details four core incursion scenarios:

1. Pest fish species new to New Zealand.
2. Pest fish new to Region
3. Pest fish established in Region
4. Pest fish incursion to new site in Region (significant site).

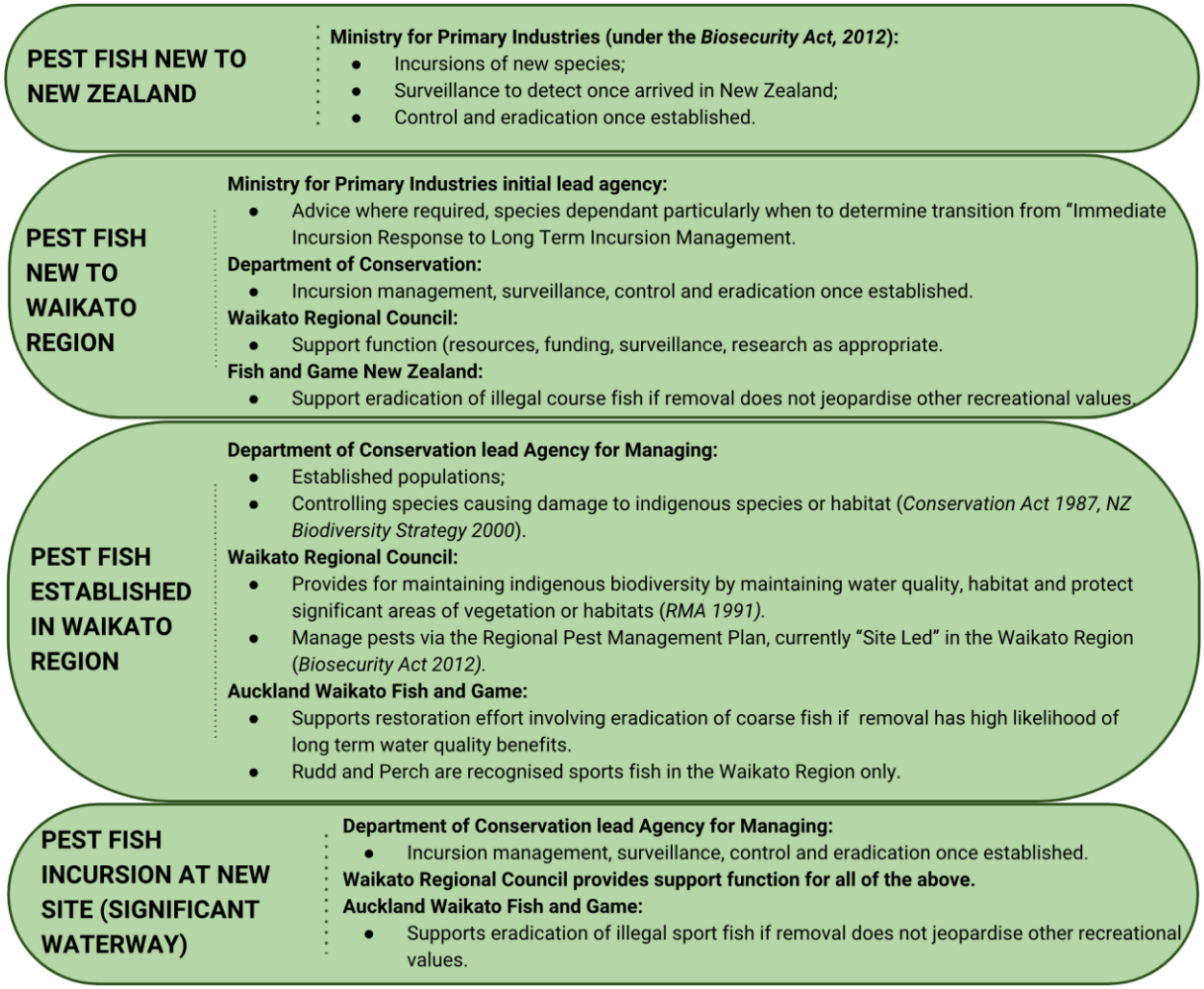

Figure 2 – National and Regional Pest Fish Management scenarios and organisation responsibilities.

It is recognised that Waikato Regional Council currently has an active role in invasive pest fish initiatives in the Waikato Region. From a statutory perspective Table 1 and Figure 2 outline the respective roles and responsibilities. Locally, DOC is the primary lead agency for these works and the Council is legislated to support DOC.

The involvement of the Council in pest fish projects in the Waikato Region and the links to water quality has led to the perception in the community that Council is the lead organisation. The recommended

workstreams and actions in Section 4 are in part to correct these assumptions and both organisations working collaboratively to provide leadership in pest fish management.

4 RECOMMENDED IMPLEMENTATION ACTIONS

The following implementation actions have been identified as the priorities for Waikato Regional Council and DOC for the next 3 years. The primary goal is to seek funding to initiate these actions by FY 2021.

Note:

Cost Assumptions: Low <$10K; Medium $10-100K; High >$100K

Implementation Workstreams	Priority Actions (next 3 years)	Supporting Actions Description	Lead Organisation	Currently Funded	Cost	Timing
Governance and Management	1. Establish an appropriate governance and cross agency structure for Pest Fish Management in the Waikato Region	1.a. Define requirements for a PFSG including membership from Waikato Regional Council and Department of Conservation. The group will provide political and strategic focus for this plan. A proposed structure is provided in Section 5.	WRC/DOC	No	Low	Jun-18
	2. Resource a Pest Fish Coordinator	2.a WRC and DOC to determine an appropriate collaborative funding strategy to resource a dedicated Pest Fish Coordinator.	WRC/DOC	No	Low	Dec-18
		2.b Support and commence the Pest Fish Coordinator role focussed on the implementation and socialisation of the recommendations in this plan.	WRC/DOC	No	Medium	Dec-18
Monitoring and surveillance	3. Design a robust monitoring and surveillance network	3.a. Define surveillance priorities (short, medium and long term). Current monitoring is adhoc and often reactive to incursions and potential sightings.	WRC/DOC	No	Low	Jun-18
		3.b. Implement annual routine surveillance. Also incorporate data collected through RMA and SOE reporting. This will support knowledge of incursions and help guide decisions on investment on interventions at specific sites. Investigate links to aaccessibility on national database.	DOC/WRC	Partially	Medium	Jun-19

Implementation Workstreams	Priority Actions (next 3 years)	Supporting Actions Description	Lead Organisation	Currently Funded	Cost	Timing
		3.c. Monitor and maintain the Pest Fish Prioritisation Table. The table provides the basis for lead organisations to understand their regulatory responsibilities, provides one version of the status of specific waterways and assists in targeted responses.	WRC	No	Low	Jun-18
	4. Initiate use of eDNA as monitoring tool	4.a Produce issues and options paper to provide justification and mechanisms for both organisations to support this monitoring technique.	WRC/DOC	No	Low	Dec-18
		4.b Obtain the relevant pest fish DNA markers required for eDNA techniques to be utilised in the Waikato Region. Ultimately seen as a cost-effective method for testing data deficient waterways for presence of pest fish	WRC/DOC	No	High	Jun-21
Incursion management	5. Formalise incursion management procedures	5.a Working with Ministry for Primary Industries to develop and adopt a formal incursion management framework. This ensures correct planning is in place to attempt eradication (if appropriate), when routine monitoring indicates an incursion.	DOC/WRC	No	Medium	Dec-19
		5.b Define priorities and actions for management of the commercial koi fishery and new incursions outside of the Koi Containment Area. Ensuring the Waikato Hydro Lakes remain koi free is a key priority.	DOC	No	Low	Dec-18
Management Tools or Projects	6. Investigate procedure for introducing CyHV-3 (Koi Carp Herpes Virus)	6.a. Socialise the issues and options of the Waikato leading the introduction of the new virus to New Zealand.	WRC	No	Low	Jun-18

Implementation Workstreams	Priority Actions (next 3 years)	Supporting Actions Description	Lead Organisation	Currently Funded	Cost	Timing
		6.b. Investigate the levels of support and feasibility of introducing CyHV-3 through DOC, Regional Councils and MPI. This project requires significant collaboration and funding support, stakeholder management and understanding of research requirements.	TBD	No	High	Jun-21
	7. Review existing management and infrastructure projects to clarify priorities	7.a. Each organisation review current and potential projects to assess effectiveness and alignment with regulatory requirements and identified priorities. This will ensure effective utilisation of limited funds.	WRC/DOC	Partially	Low	Dec-18
Advocacy, Education and Community Support	8. Proactive engagement with community and stakeholders	8.a. Working cooperatively with commercial fishers in the region to educate and eliminate the risk of inadvertent pest fish transfers	DOC/WRC	No	Low	Dec-19
		8.b. Utilise existing relationships to provide support and assistance for cross regional boundary issues and incursions.	WRC	Partially	Low	Ongoing
		8.c. Support community led initiatives for pest fish management and education days	WRC/DOC	Partially	Low	Ongoing

5 RECOMMENDED MANAGEMENT STRUCTURE

Figure 3 outlines a recommended management structure for delivery of this plan.

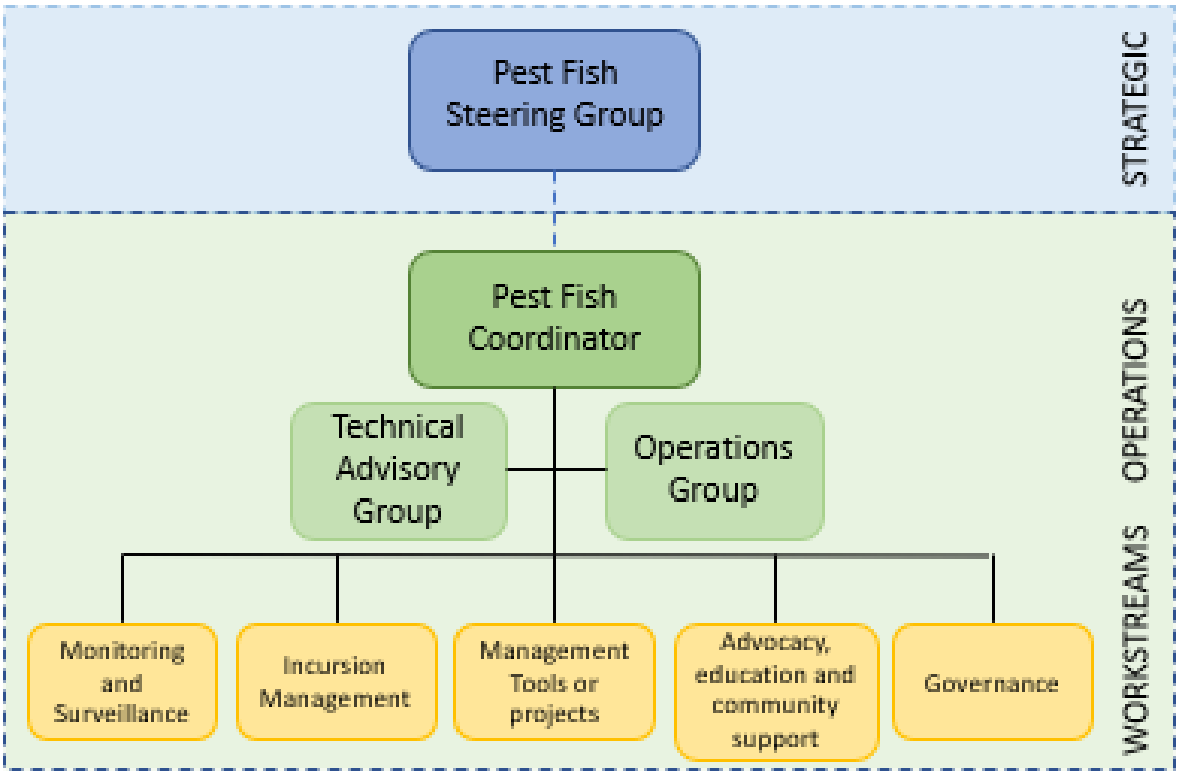

Figure 3 – Proposed Waikato Region Pest Fish Management Structure

It is recommended a Waikato Region Pest Fish Steering Group be formed to oversee implementation of the five workstreams. The Fish Steering Group will initially include membership from senior management roles at the Waikato Regional Council and DOC and will provide the political and strategic focus required to, for example, recommend appropriate funding mechanisms.

The role of the Steering Group is to determine and scope requirements to implement the workstreams in Section 4. A suggested delivery method is to fund a Pest Fish Coordinator Role.

The Coordinator role could include to following items:

- Implementing the seven Priority Actions of this plan;
- Advocacy projects and recommendations in the community;
- Lead contact for cross boundary issues;
- Recommend research to further regional and national knowledge of effects;
- Planning and support for introduction of new management tools;
- Support development of a Waikato Region Freshwater Management Plan (LTP).

To support the Pest Fish Coordinator, a Technical Advisory and an Operations Group would be established to advise on the technical and operational aspects of the project. Once established the advisory group membership could be widened to include, for example, Fish and Game, Waikato River Authority, Iwi, and other stakeholders.

6 NEXT STEPS

It is recommended to establish the management structure within 6 months.

Attachment 1 – Pest Fish Prioritisation Tool

Note that the Prioritisation Tool is provided as a separate Excel Spreadsheet to this document.

Methodology

To produce this tool Place Group has collated the data on waterways in the Waikato Region, including lakes and rivers. A draft spreadsheet was sent to individuals at the Council, DOC, Fish and Game and NIWA and their data was inputted into the spreadsheet. This information was collated, and the final Prioritisation Tool produced.

The Prioritisation Tool includes a "Waikato Lakes" tab and a "Other Waterways" tab which includes the following information:

- Waterway name,
- current status and values,
- desired status (if known),
- previous or planned restoration (including those outlined in the Waikato and Waipa Restoration Strategy),
- Lead agency at waterway site

To produce an initial pest fish presence ranking number for each waterway, yes/no queries are used and assigned a value as follows:

- Pest Fish Free; "Yes' = 1; "No" = 2
- Koi Carp Free; "Yes' = 1; "No" = 2
- Two other yes/no questions whether the waterway contains all species of known pest fish, and whether macrophytes are present. This is useful data but currently does not contribute to the overall ranking score.

Trophic Level Index (TLI) provides an overall picture of health in lakes. Each lake is assigned a number between 1 and 7, the lower the number the better the water quality in the lake. TLI is calculated using four separate water quality measurements, total nitrogen, total phosphorus, water quality and chlorophyll-a.

The spreadsheet ranking has used the following values for TLI so that water quality can be a second consideration to a potential ranking:

0. No Data
2. Micotrophic
3. Ogliotrophic
4. Mesotrophic
5. Eutrophic
6. Supertrophic
7. Hypertrophic

It is noted that rivers and streams do not have a TLI, so these waterways have been classed as 'no data' and scored 0. It is also recognised that some lakes, particularly peat lakes, may naturally have a higher TLI score. This consideration is important once a subjective assessment of the ranking is undertaken.

Other subjective information is also included where it is known. These subjective items are:

- Monitoring Urgency ('1'=1-3 years; '2'=3-7 years; '3'=7+ years)
- Pest Fish Research potential
- Poor cost benefit
- Cultural Significance.

The yes/no analysis and the TLI will provide a particular ranking, however in some cases the subjective information this will be used by the Technical Advisory Group (refer Section 6) to assess the ranking and determine the priority. In this way the ranking tool can be kept as a live document and updated once more monitoring is undertaken. A ranking review every 3 years (to time with LTP planning) may assist in determining whether any priorities have changed as a result of further research and monitoring.

The tool has the potential to rank and prioritise waterways to determine:

1. Pristine waterways with high biodiversity values and where no pest fish are present.
2. Waterways containing pest fish species with high biodiversity values that require ongoing management.
3. Waterways containing pest fish species that are of cultural significance.
4. Waterways containing pest fish species where management is not recommended.

This will provide a defined ranking of the waterways in the Waikato which remain pristine, but also identify 'high valued biodiversity sites' (Waikato Region Pest Management Plan) where management is required by Council and DOC.

Attachment 2 - Iwi Management Plans – Pest fish specific Objectives and Policy

Maniapoto

Policy 16.3.2.1(c) Be proactive in the reduction of pest fish biomass, pest plant and animals.

Raukawa Fisheries Management Plan

Objective 2 – No new populations od pest fish develop within the Raukawa rohe and existing populations are eradicated of managed to reduce the impacts on native fish

Policy 9 – Work with DOC and F&G to reach an agreed solution for banning fishing for pest fish in the rohe

Policy 10 - Advocate for appropriate identification and management of pest fish species with relevant agencies, such as councils, Ministry for Primary Industries, Department of Conservation, and with land owners and managers

Policy 11 - Support education and awareness raising in relation to the impacts of pest fish and their spread.

Policy 12 - Support measures to reduce and eradicate pest fish within the rohe

Te Arawa River Iwi Trust Fish Plan

Action F2.2 TARIT to support initiatives by WRC and DOC to:

(i)reduce the current numbers of brown bullhead catfish, gambusia and rudd in the TARIT Area of interest.

(ii)ensure that koi carp (*Cyprinus carpio*) do not become established in the TARIT Area of interest.

Action - F05 Prevent the spread of unwanted plants, pest fish and organisms

Actions F5.1 - TARIT, Ministry of Primary Industries, Waikato Regional Council and Department of Conservation to share knowledge with Te Arawa River Iwi and raise awareness in relation to:

i. What type of freshwater pest animals, pest fish and organisms are found within the TARIT Area of Interest

ii. How to manage freshwater pest animals, pest fish and organisms iii. Freshwater pest management projects that Te Arawa River Iwi could get involved/lead

F5.2 TARIT to support initiatives by the Waikato Regional Council and Department of Conservation to:
i. reduce the current numbers of brown bullhead catfish, gambusia and rudd in the TARIT Area of Interest.
ii. ensure that koi carp (*Cyprinus carpio*) do not become established in the TARIT Area of Interest.

Tuwharetoa Environmental Iwi Management Plan

Flora and Fauna- Other Tools - Encourage initiatives that promote indigenous vegetation and the removal of exotic species

Waikato Tainui Environmental Plan, Tai Tumu, Tai Pari, Tai Ao

Objective – biosecurity risks

15.3.3 Priority plant and animal pests are appropriately identified, managed, and/or controlled to a level where their impacts are minor or, where possible, are eradicated.

Attachment 3 – Regional Policy Statement Excerpt

Excerpt from the Regional Policy Statement - Section11A Criteria for determining significance of indigenous biodiversitv

The following criteria are to be used to identify areas of significant indigenous biodiversity and their characteristics as they exist at the time the criteria are being applied.

Criteria may be specific to a habitat type including water, land or airspace or be more inclusive to address connectivity, or movement of species across habitat types. To be identified as significant an area needs to meet one or more of the criteria identified in the table below.

Areas of significant indigenous biodiversity shall not include areas that have been created and subsequently maintained for or in connection with:

• artificial structures (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity); or

• beach nourishment and coastal planting (unless they have been created specifically or primarily for the purpose of protecting or enhancing biodiversity).