

URBAN WATERWAYS

Survey of Hamilton Residents

*Monica Peters
June 2008*



NZ Landcare Trust
landcare action on the ground

Monica Peters is a Projects Coordinator for the NZ Landcare Trust. The NZ Landcare Trust (www.landcare.org.nz) promotes sustainable land management through community involvement. To achieve this, the Trust works with private rural landowners and a diverse range of community groups on landcare, sustainable land management and biodiversity projects. The Trust provides independent facilitation to empower groups; information brokering; support and encouragement of community groups; development of networks, partnerships and collaborations.

Acknowledgements

Thanks to the Project Steering Group:
Tim Newton and Liz Hallsworth, Hamilton City Council
Kevin Collier and Judy Van Rossem, Environment Waikato

Also many thanks to:
Drs. Mairi Jay and Otilie Stollte, Waikato University
and Paul Chantrill, Environment Waikato,
for advice on survey design.
Bryan Clements, Environment Waikato, for assistance with
mapping and developing the database for the mailout.
Melinda Dresser, NZ Landcare Trust, for assisting with data entry.

Executive summary

In February/ March 2008, 1000 surveys were sent out to randomly selected property owners bordering the five main gully/ stream systems in Hamilton City: Mangakotukutuku, Waitawhiriwhiri, Bankwood, Fairfield and Kirikiriroa (Total properties = 3081). The majority of respondents (66%) had been resident at the given addresses for more than 5 years. In spite of this, few knew the actual name of the stream or gully. Reasons are likely to include the size and nature of the waterway (e.g. pipe or drain), a lack of signage, accessibility and/ or interest compounded by the fragmented and complex nature of the waterway systems within the urban environment.

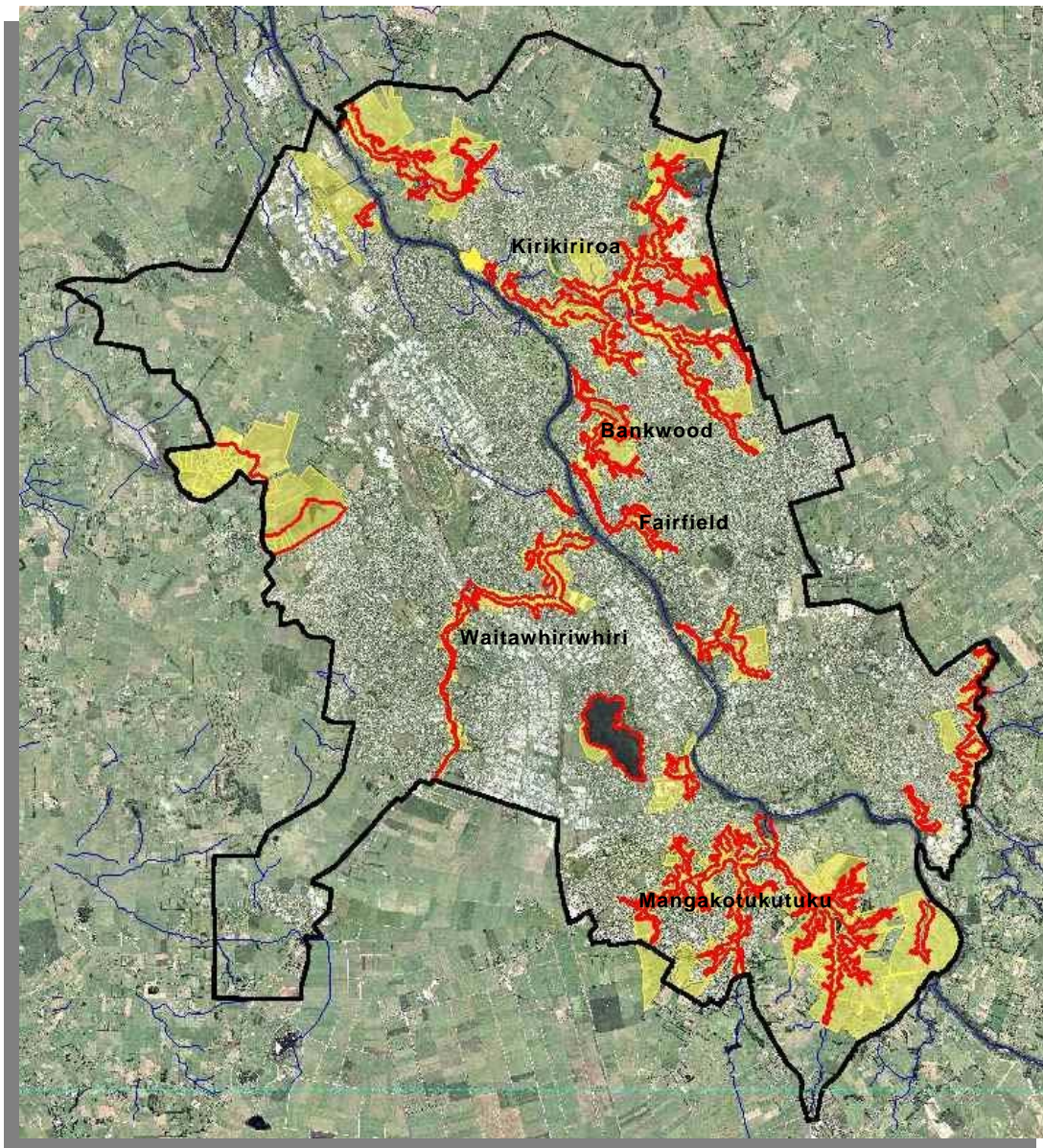
Waterway character though diverse comprises mainly streams/ rivers (46%). Generally, flooding was thought to occur in all waterways, particularly the Waitawhiriwhiri and Kirikiriroa systems. Most survey respondents believe that surface water generated from their properties goes into the stormwater system though 84% also agree/ strongly agree that stormwater runoff could flush harmful substances into the city's waterways. Almost all agreed/ strongly agreed that soil and mud running off land affects water quality. Overall, few respondents (16%) felt the city's waterways were in good health. Eels surfaced as the most mentioned form of aquatic life in the city's waterways; possibly because they are visible and also because they are tolerant of a range of environmental conditions. Other species e.g. rats and ducks were included and respondents also provided information about species formerly present e.g. koura. Residents' recollections also highlight the dynamic nature of these systems as well as the negative effects of urban development (e.g. subdivision and roading).

Although most (46%) agreed/strongly agreed there was a need for habitat in waterways to support native fish, others commented on the need to free waterways from debris. 42% of respondents agreed/strongly agreed that man-made structures (e.g. culverts, pipes) hindered native fish passage. 25% answered "Don't know". Almost all (87%) gave a positive response to the benefits of planting stream banks for overall waterway health. Responses were varied around streams causing problems with erosion with slightly less positive than negative responses (27% and 32% respectively). Similar variation occurred in responses to whether flooding was detrimental for stream health.

The Hamilton City Council Gully Programme was the most well known with others such as the Mangakotukutuku Stream Care Group also mentioned. 51% of survey respondents did not know of, and were not involved with any form of waterway/ gully restoration initiative.

Improvements to waterway management drew diverse responses including: the need for greater awareness raising and information dissemination; improved stormwater management; the need for more planting of native species; weed and rubbish removal; pest control and stronger maintenance of waterways (e.g. removing blockages); improved communication between council staff and nearby residents when works were being carried out. The points raised here were reinforced in the general feedback section of the survey. Respondents also described a range of incentives to assist/ support waterway and gully restoration as well as general recommendations.

Most survey respondents (63%) felt that restoration activities associated with the city's waterways should be covered by both Hamilton City and Environment Waikato rates (28% and 35% respectively). National level funding was also seen as an important means toward funding waterway improvement/restoration. There is a strong degree of interest in gully/ waterway restoration from the community indicated by the high numbers of survey respondents requesting Gully Guides (97 respondents) and those who described some sort of activity within their local waterway (e.g. membership to a group or own planting/ enhancement initiatives).



Map of main stream/ gully systems covered in survey. Map courtesy of EW.

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1 Introduction

1.1 Hamilton City waterways

“...a major and unique asset to the city - most enjoyable for walks!” (survey respondent)

Hamilton's gullies are a key landscape and natural feature within the city covering an estimated 8% (750ha) of the city area.¹

1.1.1 Formation

Hamilton's gullies were formed as the Waikato River began to cut through an accumulation of sands, silt, peat and gravel known as the Hinuera formation. Over time as the river deepened, springs were exposed along the riverbanks. The springs eventually undermined the river banks causing slips and creating an intricate network of streams and associated gullies draining into the Waikato River².

1.1.2 Values

Hamilton's District Plan envisages a Green Network which links the city's natural features into a continuous natural corridor and, over time, restores them. The function of this green corridor is to increase urban biodiversity and improve the natural environment that supports the city³. As important natural features, the city's gullies and waterways:

- Contain significant areas of native vegetation
- Provide corridors for wildlife
- Are a recreational asset
- Are aesthetic parts of the urban landscape
- Contain heritage sites of historical and cultural importance
- Function as critical drainage for the city

1.2 Scope and nature of report

The primary aim of the survey was to determine the experience and understanding of a random sample of 1000 Hamilton residents whose properties border major urban waterways (excluding the Waikato River and city lakes - Rotoroa/Hamilton and Waiwhakareke). This report outlines the survey findings in order to assist management agencies to better cater for the needs of Hamilton residents. Recommendations drawn from the survey respondents have been included. The covering letter and the survey are appended.

¹ Downs *et. al.* 2000. Key Ecological Sites of Hamilton City: Vol 1 Survey Report. CBER. University of Waikato

² Wall, K. and Clarkson. B 2001. Gully Restoration Guide. Hamilton City Council.

³ Wall, K. and Clarkson. B 2001. Gully Restoration Guide. Hamilton City Council.

2 Methods

Properties bordering waterways and waterbodies were identified through the Environment Waikato Ratings database⁴. Properties adjoining the Waikato River, Lake Rotoroa/ Hamilton Lake and Lake Waiwhakareke were then removed⁵. Five main gully/ stream systems were identified, namely Mangakotukutuku (938 residential properties), Waitawhiriwhiri (534 residential properties), Bankwood (219 residential properties), Fairfield (216 residential properties) and Kirikiriroa (1173 residential properties). As the total number of residential properties came to 3082, a percentage of each of the 5 gully/ stream systems was taken in order for 1000 surveys to be posted out. This enabled the amount of surveys posted out to residents of any given stream system to be proportional to the overall size of each stream system.

2.1.1 Data analysis

Data were analysed in two ways. Firstly, the 5 stream systems were aggregated and general conclusions drawn from the range of feedback provided by the survey respondents. To gauge residents' experience and understandings of their own waterways and e.g. any specific characters and issues associated with each waterway, data were also analysed within each stream system.

3 Results and discussion

Of the 1000 surveys mailed out, 239 (24%) were returned. Although a return date was set at 14 days after the mail out, data from surveys returned after the deadline were also included in this report to increase the sample size. Percentage returns of surveys from each area are as follows: Mangakotukutuku 28%, Waitawhiriwhiri 16%, Bankwood 15%, Fairfield 6% and Kirikiriroa 35%. Incentives such as movie vouchers and a petrol voucher were included and may have contributed to the overall high return rate (see Appendices for cover letter).

3.1 Background information

3.1.1 Nature of property ownership

Q1. Do you rent, own or lease the property you live in?

Survey respondents were asked if they rented, owned or leased their properties. Due to the nature of the database addresses were drawn from, all survey respondents are home owners.

3.1.2 Length of time at address

Q2. How long have you lived at this property?

The majority of home owners surveyed (66%) have been resident at the given addresses for more than 5 years. Other categories included 1-5 years (26%), 6 months - 1 year (3%) and less than 6 months (5%).

⁴ The ratings database covers home owners as opposed to rental properties.

3.2 Stream knowledge

3.2.1 Presence/absence of gully/stream

Q3. Is there a waterway adjoining your property or in a park adjacent to your property?

Of the residents surveyed, 86% respondents had waterway on or near their properties. Of the remaining respondents, 11% answered “No”, and 3% answered “Don’t know”. One survey respondent replied “*I am sad to say I have not seen nor heard my waterway*”. Due to the scale of the GIS map produced for determining properties bordering waterways, individual properties with piped (i.e. underground) waterways could not be identified hence the need to include this question. An important issue raised by survey respondents centred on ownership and responsibility. In some cases owners were not clear about their property boundaries: “*When we bought this house (Jan 07) we weren’t even told we owned the land across from the stream. You couldn’t see the stream and didn’t hear much*”. This has significant implication in terms of taking responsibility for restoration activities.

3.2.2 Name of gully/stream

Q4. What is the name of the waterway/gully nearest your property?

Although there was a general lack of awareness of the actual name of the stream or gully (i.e. Mangakotukutuku Waitawhiriwhiri, Bankwood, Fairfield and Kirikiriroa), just over half of survey respondents (54%) provided either a stream or local gully name e.g. Mill stream (Deanwell) and Glen Lynne gully (Queenwood) or the name of the nearest park (e.g. Resthills park, Donny Park, Tauhara Park). In some cases, no name was given and only the size or nature of the waterway given: “*Tiny tributary - don’t know name*”, “*Storm water drain*” and “*No name, just an ankle deep drain*”. While this may highlight the lack of awareness of linkages between waterways in the city and thus which waterway they belong to, understanding the pathways of the city’s meandering stream network can be confusing. Several reasons are likely to include a lack of signage, the divaricating nature of the waterway systems, and the way in which the city is built around (and on) the waterways. This has resulted in a fragmentation of the city’s waterways with significant piped and/ or buried stretches.

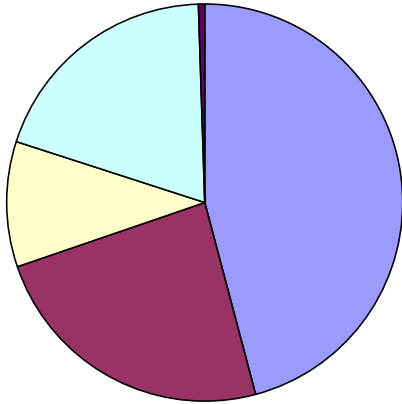
3.3 Waterway character

3.3.1 Waterway types

Q5. How would you best describe the waterway nearest your property? (multiple answers possible)

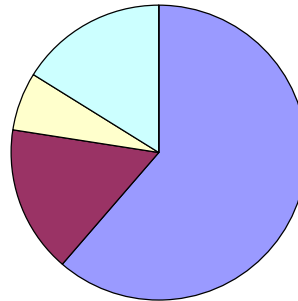
Categories: Stream or river; Drain or channel; culvert and/or pipe; Swamp/ boggy area/ wetland; Don't know

All streams combined



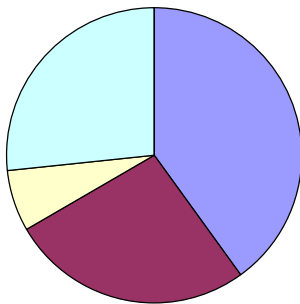
Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Bankwood



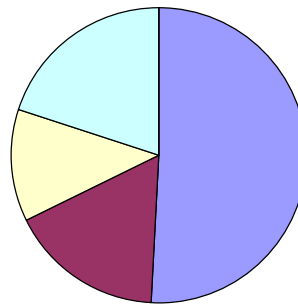
Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Fairfield



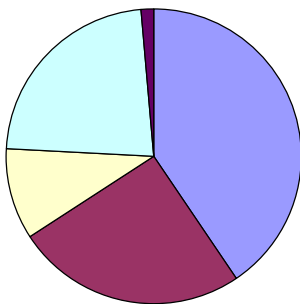
Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Mangakotukutuku



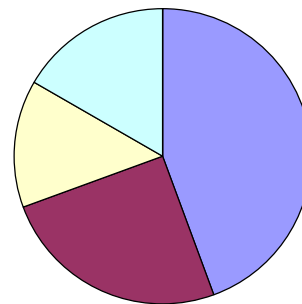
Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Kirikiroa



Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Waitawhiriwhiri



Legend: Stream (blue), Drain (maroon), Culvert (cyan), Swamp (yellow), Don't know (dark maroon)

Hamilton waterway character is diverse with respondents able to name as many waterway types as applied to their local system (n=607). Just under half of the responses were stream/ river (46%), with drains (24%) and swamps (19%) also used as descriptors. Very few respondents didn't know how to describe their local waterway.

Waterway type	Stream/ river	Drain/ channel	Culvert/ Pipe	Swamp/ boggy area/ wetland	Don't know
# responses	278	146	62	117	4

What is not clear from this question is what people consider to be the difference between a stream and a drain. However the responses show that many of the city's waterways have been heavily modified.



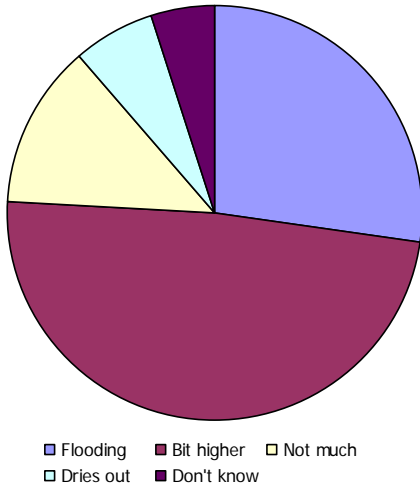
Mangakotukutuku Stream

3.3.2 Water flow

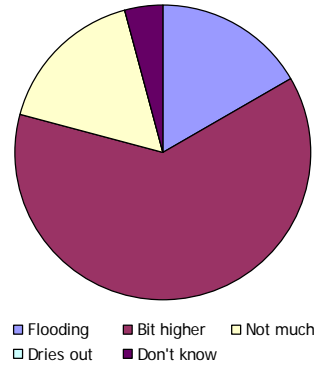
Q6. What's the water flow normally like? (single answer only)

Categories: Prone to flooding after heavy rain; Occasionally gets a bit higher after heavy rain; not much there – just a trickle most times; Dries out in summer; Don't know

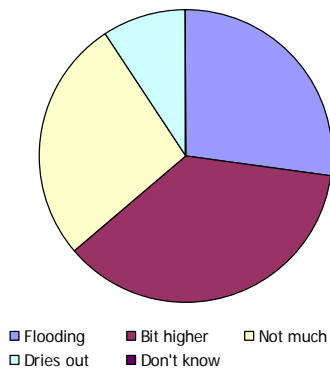
All streams combined



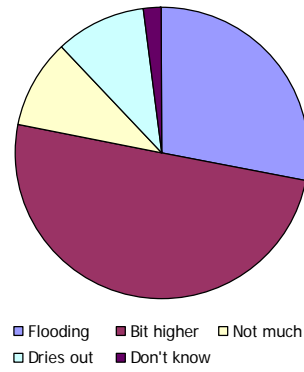
Bankwood



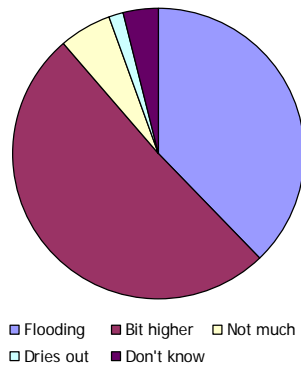
Fairfield



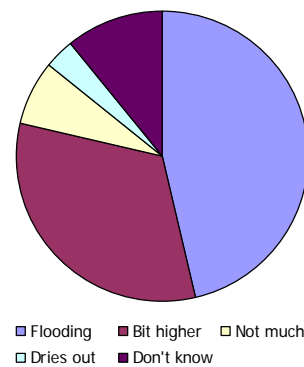
Mangakotukutuku



Kirikiroa



Waitawhiriwhiri



As water flow has significant implications for waterway management, there is a need to develop a picture of the perceived water regimes. The overall responses (n= 234) highlight the dynamic nature of these systems.

<i>Normal water flow</i>	<i>Prone to flooding after heavy rain</i>	<i>Occasionally gets a bit higher after rain</i>	<i>Not much there; just a trickle at times</i>	<i>Dries out in summer</i>	<i>Don't know</i>
# responses	64	114	30	15	12

Generally, flooding was thought to occur in all waterways, with Waitawhiriwhiri rating the most flood-prone followed by Kirikiriroa. *“The amount of stormwater going into the stream on our property has caused the bed of the stream to drop by .4 meters which in turn is causing slumping of the bank”*

“Until stormflows are controlled, its' hard to see how our stream will improve - the erosion is huge and there are few stable habitats. Must control runoff and slow it down. Need to find out best kind of riparian planting in these kinds of gullies - nobody seems to know what provides shade, stabilises banks and resists storm flows” (Mangakotukutuku)

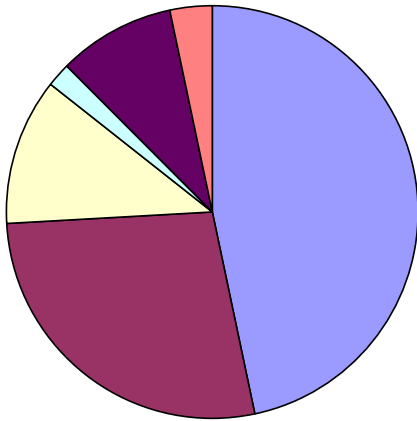
Cross referencing to Q5 (where respondents were asked to describe their waterway), just over one third (34%) of the responses show waterways to be heavily modified (drain/ channel or culvert/ pipe). There are relative few sites described as wetland/ boggy areas (19%) which increase the capacity of an area to absorb (and slowly release) excess flow during heavy rain events.

3.3.3 Surface water

Q7. Where does the surface water from your property goes to? (multiple answers possible)

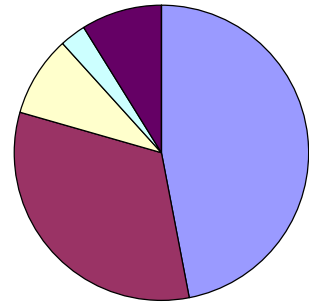
Categories: Into stormwater drains/ pipes; Into the gully; Into the nearest waterway; Into the sewerage system; Into a soak hole; Don't know

All streams combined



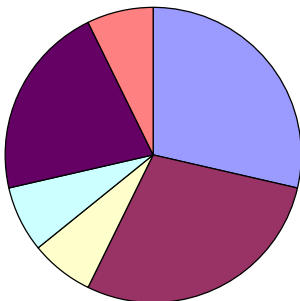
Stormwater Gully Waterway
Sewerage Soak hole Don't know

Bankwood



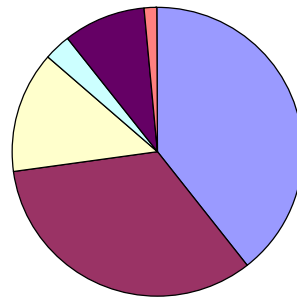
Stormwater Gully Waterway
Sewerage Soak hole Don't know

Fairfield



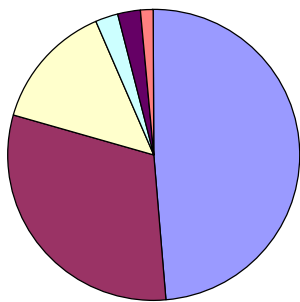
Stormwater Gully Waterway
Sewerage Soak hole Don't know

Mangakotukutuku



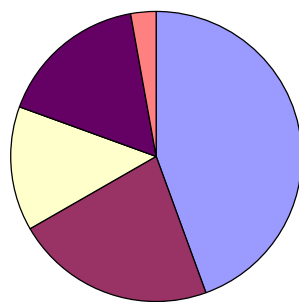
Stormwater Gully Waterway
Sewerage Soak hole Don't know

Kirikiroa



Stormwater Gully Waterway
Sewerage Soak hole Don't know

Waitawhiriwhiri



Stormwater Gully Waterway
Sewerage Soak hole Don't know

Most survey respondents (n=311) believe that surface water generated from their properties goes into the stormwater system.

<i>Surface water runoff</i>	Stormwater	Gully	Waterway	Sewerage	Soak hole	Don't know
# responses	145	86	35	6	29	10

However 84% of the survey respondents also agree/ strongly agree that stormwater runoff could flush harmful substances into Hamilton's waterways (see Q9, Statement 10). Likewise almost all survey respondents agreed/ strongly agreed that soil and mud running off land affects water quality (see Q9, Statement 7).

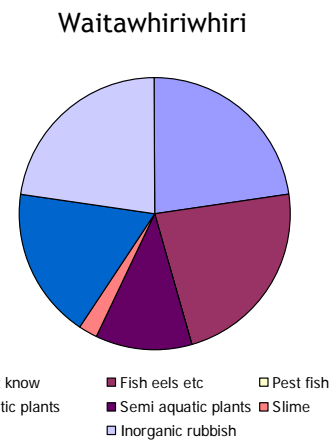
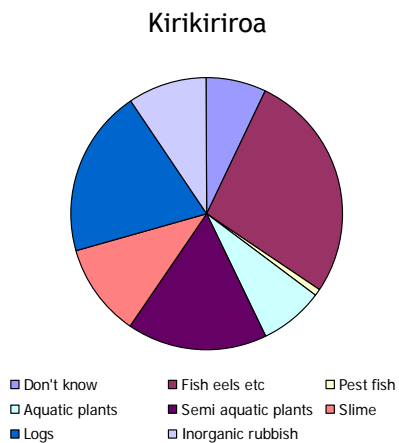
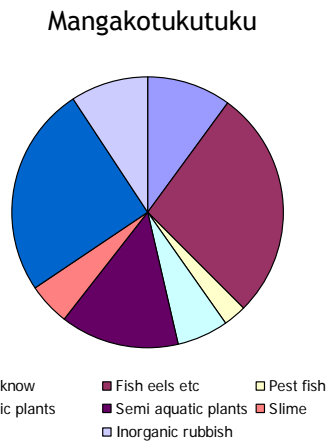
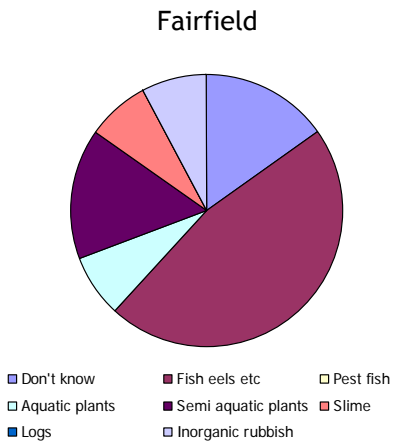
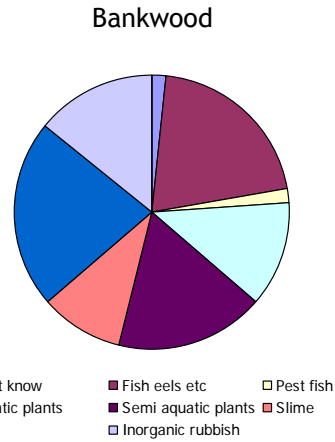
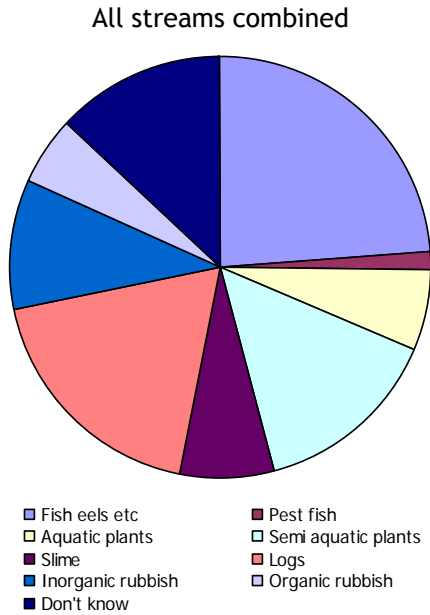


Exotic species invading waterway

3.3.4 Waterway features

Q8. What do you have in the waterway nearest your property? (multiple answers possible)

Categories: Don't know; Fish, eels and other aquatic life; Unwanted introduced fish; Aquatic plants; Semi-aquatic plants; Algae or green slime; Logs or fallen trees; Inorganic rubbish (e.g. plastic and glass); Organic rubbish (e.g. garden waste)



To capture a sense of stream diversity and character, residents were asked to tick as many of the following features they were aware of in their waterway. Data below are compiled from all survey respondents.

Waterway features	Fish eels etc	Pest fish	Aquatic plants	Semi aquatic plants	Slime	Logs	Inorganic rubbish	Organic rubbish	Don't know
# responses	116	7	30	70	36	90	49	25	64

The category “Fish, eels etc.” had space for survey respondents to detail particular life that they were aware of. Information from this section can be found overleaf in Waterway life. Space was also provided for comments which yielded a range of responses. Some survey respondents listed the range of weeds present, while other focussed on management related issues. These comments provide useful snapshots of local waterway conditions:

“I haven’t walked through the park for a while but generally over the past 6 years especially in the stream from the playground by Emerald St., coming down through the park has been littered with rubbish, logs and a tank at the top has sometimes has disgusting coloured water and rubbish in it” (Bankwood)

“Chemicals are sometimes dumped down the bank from factory warehouses opposite the gully, killing vegetation also inorganic waste” (Waitawhiriwhiri)

“Sometimes a greyish murky filmy look that comes and goes” (Bankwood)

“Silt washed down from development on hill above, also have oil in drain” (Kirikiriroa)

Respondents who answered “Don’t know” could have done so for a range of reasons. Access is an issue in some locations: *“Can’t get real close to look and have never looked!”* (Bankwood)

Although most survey respondents (46%) agreed/strongly agreed about the need for habitat in waterways for native fish, respondents also commented on the need for the council to free waterways from debris e.g. *“... keep waterway clear of clutter”*. While comments such as this, and: *“Keep culvert and drain clean and drain swamp areas”* may highlight a need for education, some respondents may view areas which have been poorly maintained or not maintained as better off drained etc.

3.3.5 Waterway life

Q8a. Can you name any (of the life in the waterway nearest your property)? (multiple answers possible)

Specific waterway life	Eels	Frogs	Fish	Snails	Invertebrates	Koura	Ducks	Rats	Birds	Other
# responses	83	20	12	5	3	6	9	8	4	1

Respondents were asked to elaborate on the tick-box answers given in Q8. In this question, eels surfaced as the most mentioned form of aquatic life in the city’s waterways; possibly because they are visible and also because they are tolerant of a range of environmental conditions. Respondents also chose to include other species - not necessarily aquatic - though generally also associated with gully systems e.g. rats and ducks. Glow worms were also mentioned (Mangakotukutuku). There were very few instances of actual species names given. In most cases only generic names were given. Examples of more specific names in these larger groups included: “*banded/giant(?) (sic) kokopu, Australian green and golden bell frog*” (Mangakotukutuku); “*Mosquito fish, kokopu, smelt, long and short finned eels, mayflies, caddisflies, waterboatmen, chironomids*” (Mangakotukutuku); “*Short-finned eels, mosquito fish, smelt*” (Kirikiriroa).

Comments from survey respondents were varied though provided valuable information about the nature of their local waterway: “*Water iron-coloured so difficult to see other aquatic life*” (Kirikiriroa). In some cases respondents’ knowledge of waterway life was based on information from others: “*Have heard of eels there*” (Bankwood).

Respondents also provided information about species formerly present: “*The Waitawhiriri stream used to contain eels and fish when my children were young in the 60’s, then because of industries being built oil entered the stream, when the City Council was in charge, I would phone regularly and they would promptly come out and put a boom across and oil would be pumped out. Now EW is so hard to contact that I no longer phone up, oil and other liquid material still flows in the stream. I live right near the Dinsdale roundabout*” (Waitawhiriri). In this respect, residents’ recollections can provide useful insights into former diversity and/or ecological condition. Additionally, a few unexpected species such as a terrapin were listed from a respondent in Kirikiriroa.

Residents’ recollections also highlight the dynamic nature of these systems as well as the effects of engineering works: “*The stream is nowhere near the size or in the position it originally was; the downstream neighbour has piped and filled his section. The inlet to this pipe has since been moved several meters on to another neighbour’s property.*” (Mangakotukutuku)

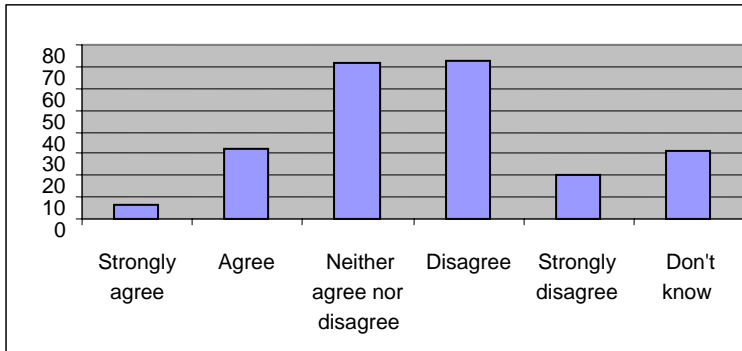
3.4 General waterway knowledge

3.4.1 Statements: agree/disagree

Q9. To what extent do you agree or disagree with the following statements?

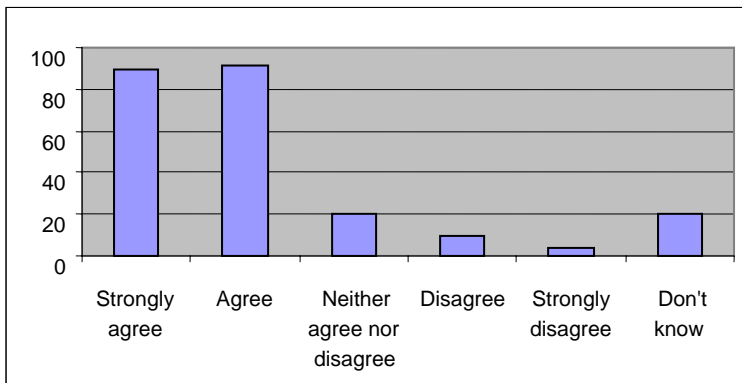
The survey included 10 statements designed to gauge residents' knowledge and understanding of general stream ecology and the effects of human impacts on waterways. Scale on LHS (Y axis) of bar graphs are numbers of survey respondents.

Statement 1. The city's waterways have clean water and are in good health



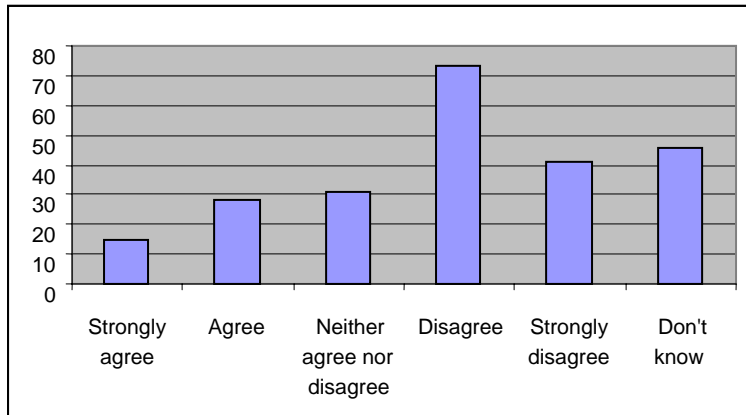
40% of survey respondents' answers to this statement were negative (i.e. disagree/strongly disagree) with a high percentage (31%) neither agreeing nor disagreeing. Few respondents (16%) felt the city's waterways were in good health.

Statement 2. The city's waterways are important for native fish



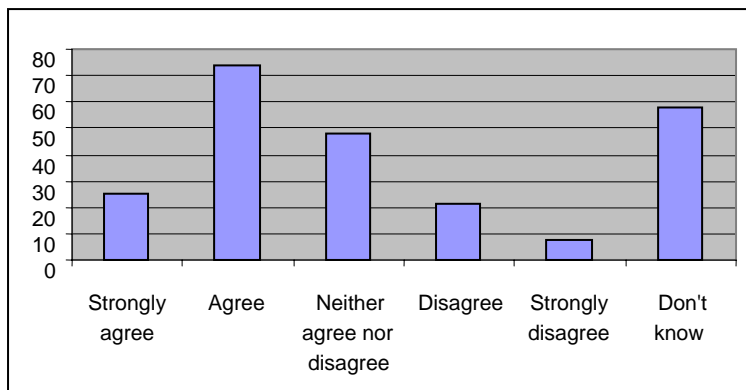
Most of the survey respondents (76%) agreed that the city's waterways are important for native fish.

Statement 3. Straight and unshaded waterways are good for stream life



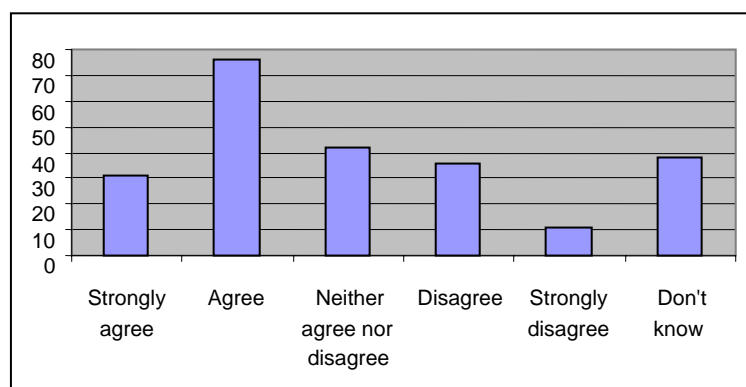
This statement drew varied responses with a high percentage of Don't knows (20%). Most however disagreed with the statement that straight and unshaded waterway are good for stream life.

Statement 4. Culverts/pipes in waterways can hinder native fish



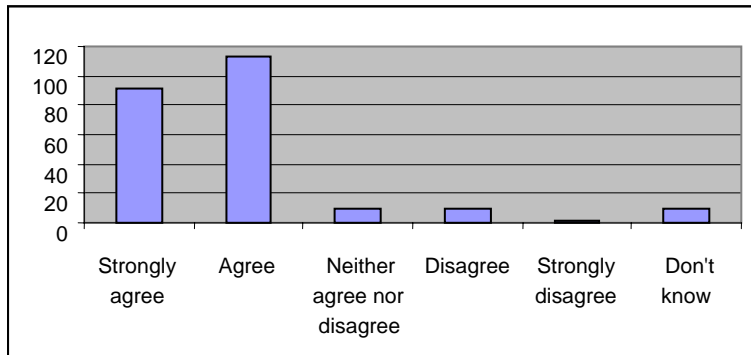
42% of survey respondents agreed/strongly agreed that man-made structures such as culverts and pipes hindered native fish. A large percentage (25%) answered "Don't know".

Statement 5. Logs, overhanging vegetation and roots in waterways improve conditions for native fish



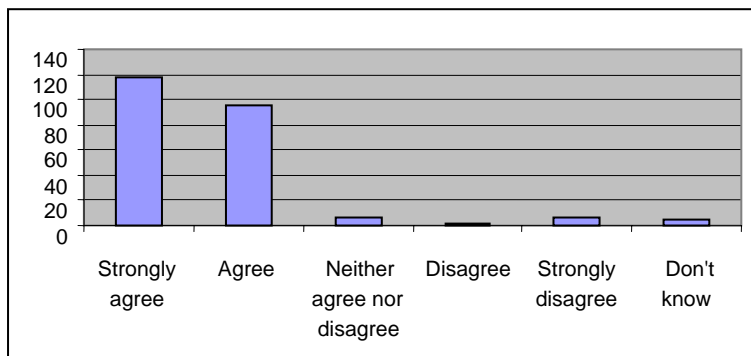
Most survey respondents (46%) agreed/strongly agreed about the need for habitat in waterways for native fish. 20% of survey respondents replied in the negative (disagree/strongly disagree).

Statement 6. Planting stream banks can make a difference to waterway health



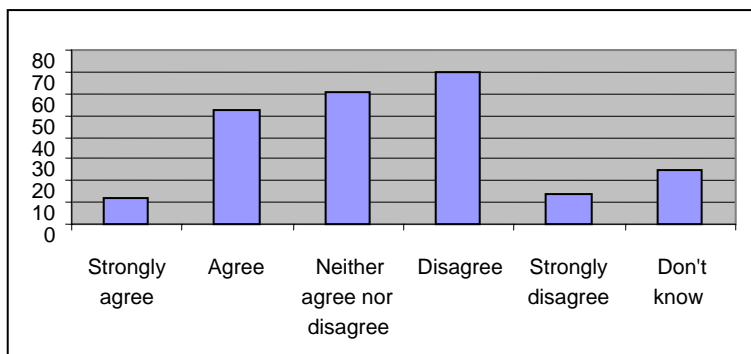
Almost all survey respondents (87%) gave a positive response to the benefits of planting stream banks for overall waterway health.

Statement 7. Soil and mud running off land affects water quality



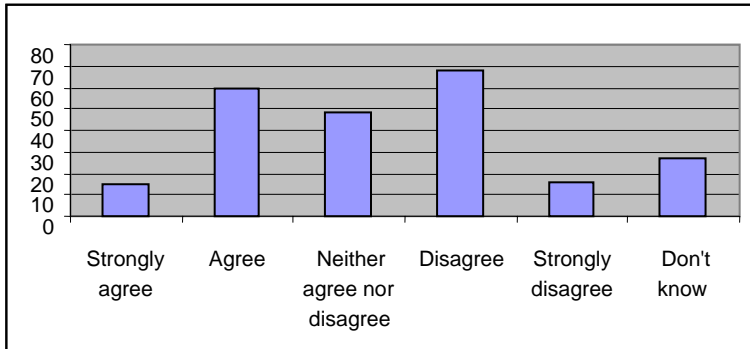
Almost all survey respondents (91%) understood aspects of the relationship between soil and mud and water quality.

Statement 8. Streams cause problems with erosion



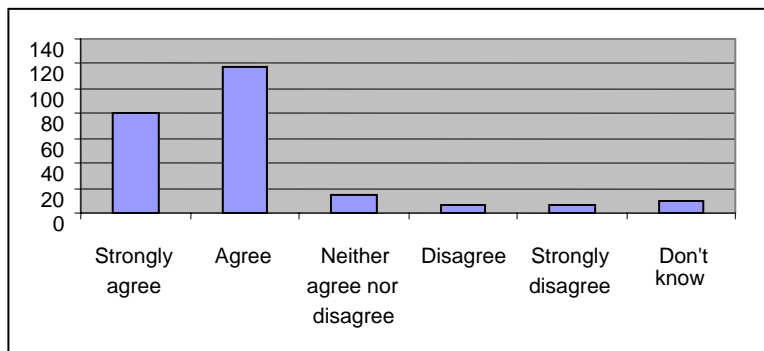
Responses were varied to the statement that streams cause problems with erosion. There were slightly less positive responses (27% agree/strongly agree) compared with negative responses (36% disagree/strongly disagree). 11% answered “Don’t know”.

Statement 9. Flooding is bad for the health of the stream



Responses to the statement of flooding having a detrimental effect on stream health were varied. There were slightly less positive responses (32% agree/strongly agree) compared with negative responses (36% disagree/strongly disagree). 12% answered “Don’t know”.

Statement 10. Stormwater runoff can flush harmful substances into Hamilton's waterways

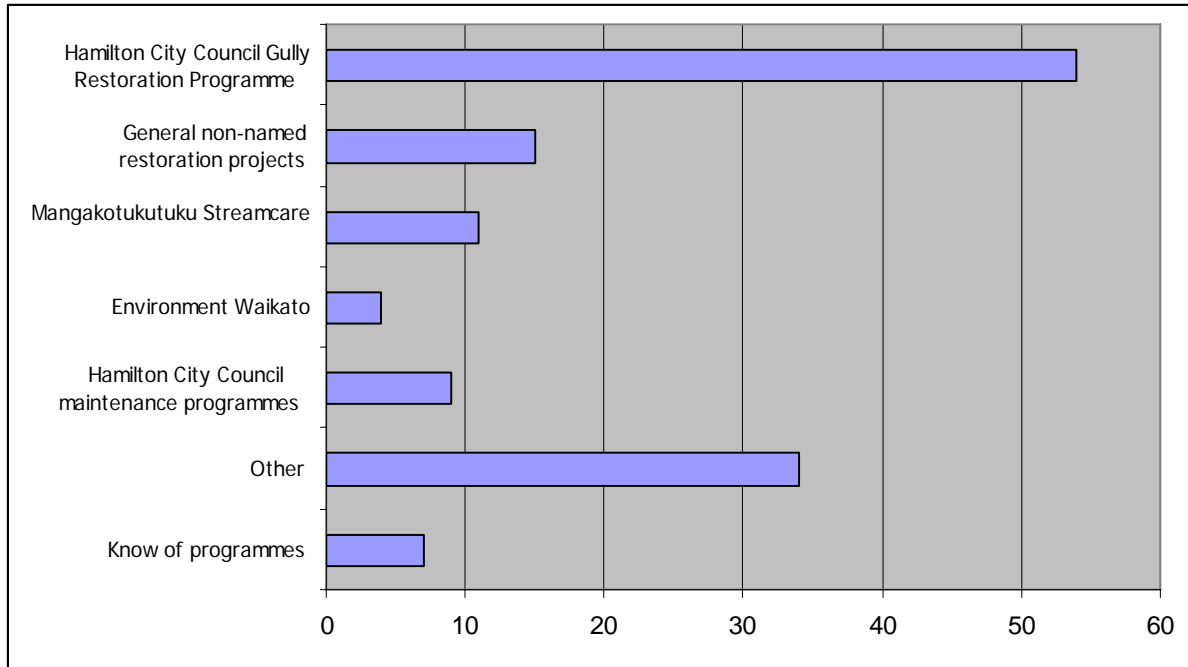


Most survey respondents (84%) agreed/strongly agreed that stormwater could flush harmful substances into the city’s waterways.

3.4.2 Restoration initiatives

Q10. Do you know of any Hamilton City programmes, community or other projects to improve / restore waterways / gullies in the city?

Those who responded positively (49%) mentioned a wide range of initiatives with the Hamilton City Council Gully Programme the most well known (54 responses).



Respondents also mentioned “Gully Restoration” though did not attach this activity to any specific group. This also includes respondents for example who are working independently in their own gullies: *“Just try and keep my part of the gully tidy”*. A separate category includes those who are not involved in any initiatives though had some level of awareness: *“Heard of some but don’t know name of coordinator”*. The category of “Other” includes Tui 2000, HCC Fish signs on drains, Glenview Peacocks Rd area project, Glenview Primary Stream Study Group, Hukanui School, Weedbusters, Taskforce Green, Tree Trust and Tamahere Community Nursery. Several individuals were also mentioned in relation to gully restoration initiatives: Peter Morris, Tim Newton, Gerard Kelly, Jan Simmons and Bruce Clarkson.

Q11. Are you involved in any of these programmes?

136 Survey respondents (51%) did not know of, and were not involved with any form of restoration initiative focussing on gullies/waterways. There are many reasons for this with age and disability a significant barrier for some: *“... disability prevents active interest. My part of a deep gully is too difficult for me to maintain and plant out as I am in very poor health. Consequently the gully has become overgrown with weeds”*.

3.4.3 Waterway management

Q12. How do you think Hamilton City Council and Environment Waikato could improve / restore and better manage the city's waterways?

160 survey respondents provided feedback in this open section, however 5 replied, don't know, not sure. Most responses covered several themes e.g. *"By enforcing / acting on information about people dumping rubbish in gullies. Eradicate unwanted weeds. Educate those who live on a gully"* and, *"Monitor gully condition, control/ limit stream pollution, check water flow restrictions by logs/ vegetation. Trap vermin e.g. rats. Inform people how to maintain the health of the gully and where to go for help when flooding or pollution problems occur"*. The responses have been divided into 11 main themes as the table below shows.

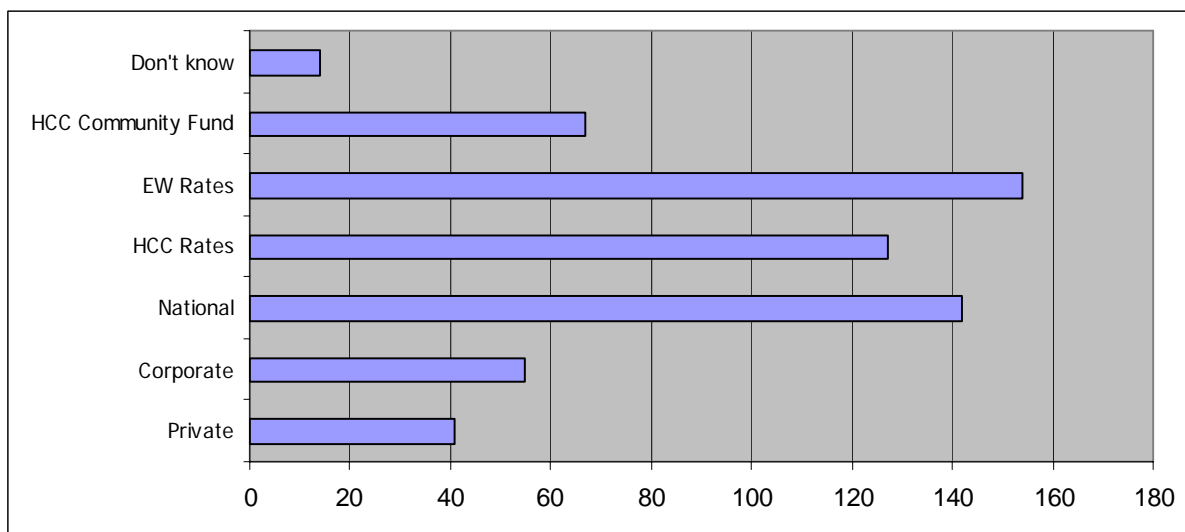
Waterway management themes & response #	Sub-theme	Examples of comments from survey respondents
General comments (31)		<ul style="list-style-type: none"> <i>"Continue with present programmes. Keep publicising gullies and restoration work and the values they bring to the city".</i>
Awareness raising & information dissemination (33)	Interpretation	<ul style="list-style-type: none"> <i>"Small signs at the entrance to each gully outlining current status, projects, and contact person if visitors wish to participate".</i>
	Communication	<ul style="list-style-type: none"> <i>"Talk to local residents on a regular basis i.e. 1/yr as residents change so they can discuss issues on changes they may want to happen".</i> <i>"Having workshops for people who live on in or near gullies to learn how to restore and improve these gullies".</i> <i>"Doing a lot already - but people have to be interested and want to know. Perhaps have an open day with an expert and invite the neighbours of adjoining gully to attend".</i>
	Engaging schools	<ul style="list-style-type: none"> <i>"Involve schools "Give" them a gully."</i> <i>"Get schools to sponsor local waterways."</i> <i>"Perhaps involve local schools if appropriate to have a clean-up day for general rubbish This could help to teach them environmental responsibility".</i>
Waterway maintenance & redesign (33)	General	<ul style="list-style-type: none"> <i>"Stop 'maintaining' drains and waterways unnecessarily i.e. stop stripping vegetation and natural debris out of streams".</i> <i>"Keeping them clutter free and regular checking and maintenance."</i> <i>"Keep culvert and drain clean and drain swamp areas".</i>
	Monitoring	<ul style="list-style-type: none"> <i>"By testing the water condition and report the finding".</i>
Vegetation/ weed maintenance (31)		<ul style="list-style-type: none"> <i>"Outlaw more invasive plants to ensure that spreading is not a problem and those who do make the effort are not penalised by others with no motivation to maintain their sections."</i>
Planting (18)		<ul style="list-style-type: none"> <i>"Plant native trees adjacent to all walkways."</i>

Incentives (17)	<ul style="list-style-type: none"> • “Personal advice to owners of properties bordering waterways.” • “Provide discount vouchers for vehicle washing at service stations”. • “Reduction in rates for those who are helping to restore gullies etc!! Help with unwanted/ dangerous large trees.” • “Ensure we have access to cheap plants”.
Rubbish clearing (15)	<ul style="list-style-type: none"> • “Have fines for polluting.” • “Have wardens to try and stop rubbish and graffiti destroying the good work done to bridges buildings etc.”
Stormwater/ run-off (12)	<ul style="list-style-type: none"> • “By installing and maintaining sand, oil and rubbish traps where street runoff enters streams”. • “Remove all unnecessary stormwater discharges into gullies - divert these directly to treatment and or the river wherever possible. Treat all stormwater”. • “More wetlands intercepting stormwater runoff = take peak off storm flows remove contaminants”.
Recreational enhancement (9)	<ul style="list-style-type: none"> • “Continue process of putting in boardwalks (improves tourism, interest of locals in gullies).”
Catchment protection (8)	<ul style="list-style-type: none"> • “Better control of subdividers requiring them to protect and enhance waterways.” • “Encourage more permeable areas in new housing developments.”
Pest control (6)	<ul style="list-style-type: none"> • “Coordinated control of pests - rats and possums to preserve the native bird habitats in gullies.”

3.4.4 Funding

Q13. How should waterway improvement / restoration be funded?

Most survey respondents (63%) felt that restoration activities associated with the city’s waterways should be covered by both Hamilton City and Environment Waikato rates (28% and 35% respectively). National level funding was also seen as an important means toward funding waterway improvement/restoration.



3.4.5 General comments

Q14. Do you have any other comments about your local waterway you would like to share?

110 survey respondents provided feedback in this open section, with responses often covering several themes. The responses have been divided into 5 main themes as the table below shows. The main themes can be divided into a series of subthemes - particularly in the case of management. To some degree the responses overlap with those in Q12. The themes and subthemes have been incorporated into the table below with examples.

General comments: themes & response #s	Sub-theme	Examples of comments from survey respondents
General comments (42)		<ul style="list-style-type: none"> • <i>"Gullies provide an unusual feature in an urban context. They should be protected as a) natural places for flora and fauna b) a means of recreation within Hamilton".</i> • <i>"Since our gully is in a low docile (sic.) area, HCC does not want to know about it. A lot of money is spent to restore gullies in high docile (sic.) areas such as Huntington".</i> • <i>"The waterways in the Waikato are a real asset and we should all be responsible for their upkeep".</i>
Management issues, solutions and needs (55)	Erosion/ slippage	<ul style="list-style-type: none"> • <i>"After flooding it scours out and leaves over hanging weeds which is dangerous for people down there but we don't go to the creek very often".</i> • <i>"My local waterway is getting bigger and has started to erode the land. I've built a wall along the bank using old car tyres which is effective. The neighbours affected by the gully should do likewise and the council also should help".</i>
	Water level decline	<ul style="list-style-type: none"> • <i>"Our stream has much less water since a major bypass (Tramway to Snell Dr) was built".</i> • <i>"The stream at the bottom of our property has become stagnant and reduced to merely more than a trickle since work started on the Crosby road end of Wairere drive".</i>
	Water quality	<ul style="list-style-type: none"> • <i>"The stagnant "pond" on Huntington Dr is disgusting. Something should be done to clean it up".</i>
	Flooding	<ul style="list-style-type: none"> • <i>"Fallen logs and rubbish often block the stream channel and cause flooding in heavy rain".</i>
	Planting	<ul style="list-style-type: none"> • <i>"The forest floor appears to have been cleared but is open and barren, will planting follow? But the privately owned side is a mess an eyesore! Although slow growing, and not native, the oaks are nice trees..... Many Kahikatea appear to have been planted some years ago. Should native ground covers be planted too?".</i>
	Vegetation/ weed clearance	<ul style="list-style-type: none"> • <i>"We pay rates already so maybe a portion of these can be set aside for restoration. We do our best to keep the stream free; HCC workers come through and spray sides of banks maybe they could help us to clear any fallen branches".</i> • <i>"The park behind our property in Peacocks Lane is in bad neglect. A sea of weeds and rabbits. The seeds of the weeds blow into our garden causing a constant battle".</i>

	<p>Rubbish removal</p>	<ul style="list-style-type: none"> • <i>"I think more regular inspections of gullies and ww will help to restore them and protect them from abuse i.e. dumping of rubbish etc. Keeping them clear of noxious weeds which prevent natives from becoming established and the planting of more trees and the removal of rubbish".</i>
	<p>Signage/ Lighting and walkway management</p>	<ul style="list-style-type: none"> • <i>"Clearly visible signs with the names of streams to facilitate local interest /pride. More "no littering" signs with mentions of fines if found out, especially the smaller gullies/streams".</i>
	<p>Need for physical assistance</p>	<ul style="list-style-type: none"> • <i>"Keep clear of weeds especially convolvulus. We need your help for this as it is a very very steep bank and we cannot get down it at all. We have no way to get down the bank to deal with convolvulus - we need council help for this".</i> • <i>"There are 2 large willows which aren't on our land it would be helpful to have assistance removing them".</i>
<p>Awareness raising and education (15)</p>		<ul style="list-style-type: none"> • <i>"To somehow educate people not to throw rubbish into an area they should be able to see someone has spent time planting and cleaning e.g. St James Gully".</i> • <i>"I don't think many people know for e.g. that every time they drop litter or a cigarette butt that it ends up in the river. Perhaps posters and newspaper coloured advertisements at regular intervals could raise awareness or regular leaflet drops to all households".</i> • <i>"Individuals lack knowledge and understanding of how important it is and what to do as they haven't been taught. It's great to see those environment papers city news entering letterboxes throughout Hamilton. That is so well presented and great way to take a lot of advice and to see the city council environmental dept. cares".</i>
<p>Council maintenance works and public consultation (9)</p>		<ul style="list-style-type: none"> • <i>"Council plants and leaves, doesn't come back to check!"</i> • <i>"I think that HCC and EW do a brilliant job and I don't mind paying rates for the job they do".</i> • <i>Perhaps this problem should have been solved sooner by technical review / follow-up done on a ?3 monthly basis and regular consultation with adjacent landowners re potential issues".</i> • <i>"Came on to our property without our permission (this sorted privately)".</i>

3.4.6 Requests for Guides

A total of 97 survey respondents requested Gully Guides. Although respondents were not specifically asked if they already received guides, several noted that already received newsletter and owned a Guide.

4 Recommendations from survey respondents

Raise awareness of waterway value

- Place small signs at the entrance to each gully outlining current status, projects, and contact person
- Develop an education campaign about stormwater pathways
- Create posters, carry out regular leaflet drops to all households and coloured advertisements in newspapers at regular intervals
- Have waterway restoration/ improvement workshops for people who live on in or near gullies
- Have an open day with an expert and invite the neighbours of adjoining gully to attend

Provide disincentives for polluters

- Stronger rules / fines re dumping rubbish
- More "no littering" signs especially the smaller gullies/streams

Engage schools

- Involve schools "Give" them a gully
- Get schools to sponsor local waterways
- Involve local schools in a clean-up day for general rubbish
- Educate and develop an appreciation of native species present starting in schools

Improve communication between agencies and public

- Talk to local residents on a regular basis i.e. 1/yr as residents change
- Ask permission when entering private land
- Contact residents whose properties link directly to gully or stream prior to works starting
- Provide relevant contact numbers for residents when starting works

Encourage ownership

- Provide incentives e.g. weed killers, discounts/funding for ecosourced native plants, one-on-one advice, cheap hire of machinery/tools, free labour/ assistance managing weeds and large trees
- Work in collaboration with community groups, providing them with training and education

Improve waterway maintenance & design

- Maintain vegetation and natural debris in streams
- Inspect gullies and waterways more regularly
- Undertake more water quality monitoring
- Manage subdivision and roading development so as not to impact on water levels and quality
- Increase waterway boardwalk infrastructure
- Provide more recreational opportunities
- Control weeds and pests
- Replace exotics with native plants where possible

Manage stormwater

- Install and maintain sand, oil and rubbish traps where street run-off enters streams
- Remove all unnecessary stormwater discharges into gullies and divert to treatment and/ or the river wherever possible
- Modify existing stormwater facilities to reduce the effect of rainfall events
- Create more wetlands to intercept stormwater runoff to take peak off storm flows and remove contaminants

5 Appendices

Cover letter and survey

Have your say about Hamilton's waterways !



The New Zealand Landcare Trust is carrying out a survey of property owners living next to waterways in partnership with Hamilton City Council and Environment Waikato. We want to find out what Hamilton residents think about the city's waterways. By filling out this survey, you'll help both Hamilton City Council and Environment Waikato to understand your aspirations for the city.

Please post your completed survey back by March 12 in the envelope provided.

WIN PRIZES!

The first 25 replies will receive a movie voucher and all replies will go in the draw for a \$50 fuel voucher. To make sure you receive the voucher and go into the draw, return this covering letter with your completed survey so we know where to send the prize to. Once received, the covering letter will be removed to ensure your survey replies remain confidential.

WORKSHOPS

The Hamilton City Council has brought together a series of lectures and field trips with themes ranging from gully ecology to restoration. Please see the enclosed flyer.

IMPORTANT

All information you provide remains private and confidential. Any written material produced by this project (e.g. reports) will not identify any respondents or addresses so that answers cannot be traced back to individuals.

Yours sincerely,
Monica Peters, Projects Coordinator



Have your say about Hamilton's waterways !

Background information

1. Do you rent, own, or lease the property you live in (tick which applies)
2. How long have you lived at this property ?
 less than 6 months, 6 months - 1 year, 1 year - 5 years, more than 5 years
3. Is there a waterway adjoining your property or in a park adjacent to your property ?
 Yes , No, Don't know If No or Don't know, go to Q.9
4. What is the name of the waterway/ gully nearest your property ?

.....
 Don't know

What's the waterway like?

5. How would you best describe the waterway nearest your property? (tick as many as apply)
 Stream or river
 Drain or channel
 Culvert and / or pipe
 Swamp / boggy area / wetland
 Don't know

Other (please describe)

If the waterway nearest your property is fully culverted / piped and / or not visible, go to Q.9

6. What's the water flow normally like ? (tick one)
 Prone to flooding after heavy rain
 Occasionally gets a bit higher after heavy rain
 Not much there; just a trickle most times
 Dries out in summer
 Don't know

7. What is your understanding of where the surface water from your property goes to? (i.e. any water from your driveway, pool, roof and section after rain, cleaning etc) (tick as many as apply)

- Into stormwater drains/pipes*
- Into the gully*
- Into the nearest waterway*
- Into the sewerage system*
- Into a soak hole*
- Don't know*

8. What do you have in the waterway nearest your property ? (tick as many as apply)

- Don't know - go to Q.9*
 - Fish, eels and other aquatic life (e.g. frogs, crayfish, snails)*
- Can you name any?*

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- Unwanted introduced fish (e.g. catfish, koi carp, mosquito fish)*
- Aquatic plants (plants growing underwater)*
- Semi aquatic plants (plants on the water's edge with roots and other parts in the water)*
- Algae or green slime*
- Logs or fallen trees*
- Inorganic rubbish (e.g. plastic and glass)*
- Organic rubbish (e.g. garden waste)*

Other (please describe)

.....

.....

9. To what extent do you agree or disagree with the following statements?

Use the scale 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree, 5 = strongly disagree, 6 = don't know

The city's waterways have clean water and are in good health	
The city's waterways are important for native fish	
Straight and unshaded waterways are good for stream life	
Culverts / pipes in waterways can hinder native fish	
Logs, overhanging vegetation and roots in waterways improve conditions for native fish	
Planting streambanks can make a difference to waterway health	
Soil and mud running off land affects water quality	
Streams cause problems with erosion	
Flooding is bad for the health of the stream	
Stormwater runoff can flush harmful substances into Hamilton's waterways	

Agency and community initiatives to restore / improve waterways

10. Do you know of any Hamilton City Council programmes, community projects or other projects to improve / restore waterways and gullies in the city? Yes No

If yes, what is the name of the programmes / projects and who coordinates them?

Programme / project	Coordinated by (name the organization / group)

11. Are you involved in any of these programmes / projects? Yes No

If yes, which one(s)?

.....

.....

.....

12. How do you think the Hamilton City Council and Environment Waikato could improve / restore and better manage the city's waterways ? (continue overleaf if you need more room)

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13. How should waterway improvement /restoration activities in waterways be funded ?

(tick as many as apply)

- Private funding (e.g. individual householders)
- Corporate funding (e.g. business sponsorships)
- National funding (e.g. Ministry for the Environment, Department of Conservation)
- Hamilton City Council rates
- Environment Waikato/Regional Council rates
- Hamilton City Council Community Fund
- Don't know

Other (please describe)

14. Do you have any other comments about your local waterway you would like to share?

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Thank you for your feedback!

If you would like further information on urban waterways, gullies and related activities please tick the box below and return with your cover letter, or phone Hamilton City Council (838 6699).

- Please send me a Gully Restoration Guide and Gully Newsletters
-