

Tasman Aquatic Multisport Development Trust Concept Proposal April 2009

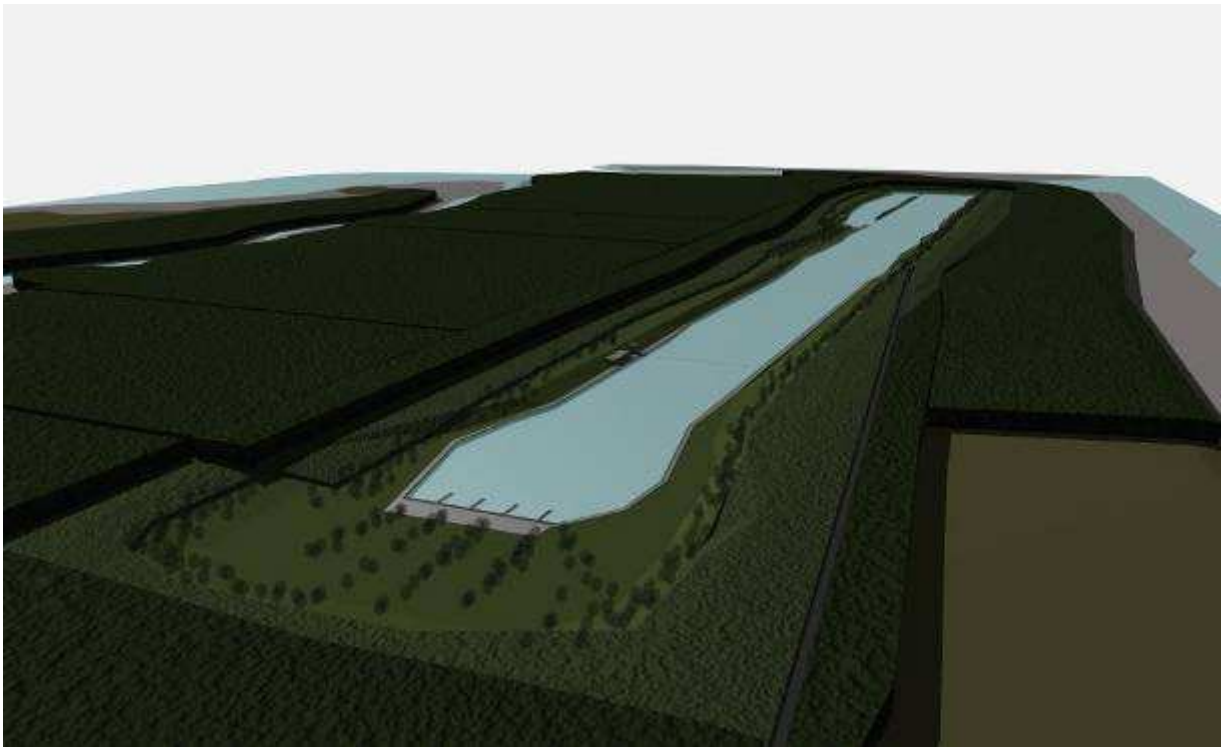


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Introduction

This is a proposal and as such many of the finer points of the course may be suggested but are open to public and TDC input and the resource consent process, providing the objective of developing an international sporting facility is not jeopardised by the suggestions. There is no template on how to do this so if the Trust has appeared to have done something out of order or not at all it is not due to the lack of desire to do it correctly. The members of the trust will attempt to complete any task necessary to meet all the requirements and follow due process.

What is the proposal?

It has been long recognised that there has been no flat water Rowing/Kayaking/Skiing course in the Nelson Region. The first investigation was made by Ben Burger, a parent of a rower, to look for water which was more suitable than the Haven and port area for aquatic sports. He spent some time searching for a course and then gathering information and interested people it was resolved in 2005 to pursue and establish such a course which should be non-commercially operated and provided to the community with minimal cost. From this the Trust was formed. It was decided that any course would have to meet certain criteria. In no particular order the criteria is as follows:

1. The course must be available to as many flat water sports and users as possible.
2. The course must be able to be used for non-sporting activity when not in use, i.e. recreational park and picnic site.
3. It must have as little environmental impact as possible and should enhance it where possible.
4. It must be built to international standards for as many flat water sports as possible.
5. It should be usable in windy conditions if possible.
6. It should be close to amenities and services.
7. Must have easy access to water for filling.
8. It must not be able to stagnate in any way.
9. The operation must be not for profit

The whole region was assessed for sites and initially it was decided that the traverse between Rough Island and Rabbit Island (Moturoa) was a good option for it. The proposal was to straighten and deepen the traverse, put flow control weirs on it and provide a course. During public discussions there were concerns primarily from Forest and Bird about the effect on the ecology of the traverse and that it would “reduce” the “wet” surface area of the estuary as a whole.

With this information, the Trust Board reassessed the region and the only area which would meet the course requirements and the concerns raised would be on Rabbit Island (Moturoa). It was felt that the new site on Rabbit Island (Moturoa) would increase the existing “wet” area of the estuary which could be designed to enhance selected ecological niches if required. In addition the existing pine forest surrounding the course would be replaced with native flora therefore enhancing the prospects for increased biodiversity and populations of native fauna. One of the reasons we discarded the idea of locating the course on Rough Island was the proximity of the end of the course to a wetland at end of Rough Island closest to the main road.

The course could be built on the island as shown in picture 1 and 2 in Annexure 1 (to scale). The positioning may vary a bit in either direction but essentially it would preferably be on the western end of the island set into the island so a wind barrier of trees could buffer any strong winds and to avoid influencing the beach areas. The course would consist of a 2.5km stretch of water 135m wide and 3.5m deep in the racing section. This will allow for 8 racing lanes and a movement lane along the edge. A 750m by 50m by 2m deep section would “protrude” from the western end of the course for the skiing course. The skiing course would have a small island separating the main course from the skiing to reduce wind fetch and wave build-up on either course. A feed channel is proposed to deliver water from the inlet near Mapua. The course would be subject to tidal flow with water being held in the course by control weirs which would be designed so that it could be filled and drained as required. The weir is also intended to double as a foot bridge for walkers and cyclists. During rowing and kayaking regattas the skiing course would be used as a warm up and start collection area for the competitors. Likewise during a skiing event they would have their own dedicated water to use for the event and for practise. The spoil excavated from the course would be shaped in terraces on the course edge up to approximately 6m in height to provide public viewing areas. On top of the terraces tall trees would be grown as an extra wind buffer. Other than this “bump” of growth the average visitor to the island would not be able to see or even be aware of a course. It would only be visible from the air.

This proposed course on Rabbit Island (Moturoa) would meet all the criteria set out for the facility including the environmental aspects i.e. it will be replacing pine (an exotic species) with more estuarine area and indigenous plants.

Who is it for?

Although this facility is targeted at the sporting fraternity (Rowing, Kayaking, Slalom Water Skiing, Waka-ama) within the community it is believed that the facility will be used by the public when it is not being used for events. It is also believed that paraplegic sports could be catered for with ease (e.g paraplegic rowing). Marathon swimming could also use the course for training in calm water to exacting distances. Many sports people have to train very early in order to avoid the wind. This course will provide a course that allows training during other periods. It will be open to non sporting activity such as water safety training or scouting as they need to use it.

The course will bring in sporting events which will introduce a significant amount of money into the region.

With careful landscaping the area surrounding the course can be planned with paths and tracks to enable further recreation opportunities for both cyclists and walkers in a native bush setting.

The fact that the course will be surrounded by a belt of vegetation which will dampen what little noise is generated suggests that this will not be an issue. The majority of sports will be very quiet as only small boats will be used (rowing coach boats). The waterskiing slalom boats are not noisy boats as their focus is on the skiing and not on parading the hardware. We are sure however that the council will have plans in place should day to day noise levels become an issue. The course will be constructed in such a way that boats can only be launched at selected points which can be controlled

SWOT analysis – a sporting perspective

A SWOT analysis of the only major South Island Rowing site, Lake Ruataniwha shows that there are very few benefits and some very influential negatives:

Lake Ruataniwha

Strengths

- Fresh water – less corrosive on equipment
- Established course – tried and tested over the years

Weaknesses

- Exposed water – of the 5 regattas held in early 2009 only one reached completion due to weather constraints.
- Long distance – It takes crews 11 hours to travel one way to Lake Ruataniwha from Nelson and longer for the North Island athletes
- Lack of accommodation – During the MAADI Cup every woolshed and sheltered corner it taken.
- No regional airport – the closest airport is 3 hours away so only the dedicated will drive the distance.

In Contrast the course on Rabbit Island (Moturoa) offers significantly more.

Rabbit Island (Moturoa)

Strengths

- Protected water – the trees and proposed orientation of the course will mean a cross wind at worst across the course. As there is limited wind “fetch” it is quite likely that events will be able to take place in all but the most inclement weather.
- Stable weather – Nelson is renowned for its sun and more stable weather when compared to the likes of Lake Ruataniwha and Karapiro in the North Island.
- Ample accommodation – Compared to Twizel there is significantly more accommodation and facilities in the region. As of a year ago there were
 - 25 backpackers with 1,047 beds
 - 19 Caravan Parks with 3,899 beds
 - 85 Motels 1,107 beds
 - Camping
- Regional airport
- Central – Nelson is centrally positioned nationally which will provide easy access to all
- Multi-user facility – The facility will be designed to international standards for a number of sporting bodies so it will be used more often and by a more diverse number of people. Because of its accessibility to the general public those who have just a passing interest can attend a regatta and find out more about the various sports.
- Beautiful setting – self explanatory
- Easy to clean – as the course flushes on the tide access to the course bed will be easy so any issues with the likes of weed etc that are found in Lake Karapiro will not be a problem here.

Weaknesses

- Saline – equipment will be corroded easier
- Undeveloped – we need to build the course.

What will it look like?

The course will be designed to fit into the natural theme as much as possible (see pictures 1 & 2 in the annexes). The course surroundings will be grassed and vegetated in native vegetation. It is envisaged that the only concrete on the course will be at boat launch points and the control gates. It is intended to keep the number of permanent structures to an absolute minimum. Buildings such as the start and finish towers will be obvious, however their scale is minimal. The start tower would have a footprint less than 10 m², while the finishing tower and control room would be around 20 m². It is hoped that buildings such as the boat holding shed will be built into the spectator viewing terraces so only the doors are visible. The length of the course will have a cycle track down one edge for coaches and for the triathlon/duathlon events. The water course will have an undulating edge which will be cobbled or vegetated to reduce reflected boat wash, and to enhance the natural environment

Engineering

There are a number of engineering considerations on the feed channel and course itself which have been discussed with engineers and there do not appear to be any issues which cannot be overcome. The engineering issues will obviously be looked at closer in the feasibility study and prior to the resource consent.

From being completely empty to completely full at a high tide the course and feed channel would require approximately 1200000m³ of water. The estuary has a daily flow of approximately 6200000m³ of water (Nelson State of the Environment report, 1993). The course would therefore require approximately 1.8% of the total flow to fill it.

How much space will it occupy?

The wet area of the course will be approximately 39ha including the canal. The total area to be influenced including the native replanting area will be approximately 95 to 115ha depending on design. This equates to between 7% and 9% of the surface area of the Island

How would it be run?

There is no fixed template for this and discussions with the Tasman District Council will have to take place in collaboration with sporting bodies and with community input. It is suggested that the Saxton field template may provide a basis on which a system may be developed. It is important to emphasise that whatever management structure is developed it will be run on a not for profit basis.

Who is supporting us so far?

Present Funding received to date

1. Initial Grants from NCC to investigate course within Nelson/ Tasman Region
2. Grant from the TDC Community Projects Fund for initial study around test holes

Pro Bono work by organisations to date

3. Includes Preliminary Design work, investigations and survey work, budgetary estimates, Presently \$ 50,000
4. Donation of Starting Pontoons from RowingNZ/ Karapiro value \$165,000
5. Lottery Grant Board application made for \$20,000 to cover investigations on site suitability, presently being evaluated. This is to enable scoping of project by Tonkin and Taylor, who have reduced fees to assist the Trust.

Existing Support

Local Support.

The following local companies are providing assistance in their relative fields

- Accounting & Auditing - Richards Woodhouse
- Surveying & Resource Consent - Staig & Smith
- Architecture - Redbox Architects
- Engineering -Taylor & Tonkin
- Construction Design - Fulton Hogan

At present we have been offered in-kind support by local rowing supporter and administrator Nanette Thomson to gain funding from local people/ organizations

Sporting and other bodies

Monaco Water ski club has supported the plan in principal based on the development providing facilities suitable for their sport, and are willing to provide funding to assist this to happen.

Rowing New Zealand have offered the design skills of Chris Johnson, who has and is currently involved in the design and construction of several international courses, including the Sydney Olympic course, to assist the Trust

The following National sporting and local bodies support the concept of the multisport course

1. Rowing New Zealand
2. Tri-New Zealand
3. Swimming New Zealand
4. Canoe Racing New Zealand
5. Paralympics New Zealand
6. Waka-Ama South Island
7. Nelson Tasman Tourism

Other Funding Options to be investigated

- Lottery Grant Board Funding- community Facilities Fund (33%)
- Community Trusts

What will it cost?

It is estimated that the course will cost about \$6 million (estimated breakdown is in annexure 1). The Trust anticipates that there will need to be funds raised to meet the balance of the cost over and above the \$3.1 million put forward in the draft LTCCP.

What events do we see as being held there?

The Trust envisages that there will be at least one major rowing, kayaking, water skiing and waka-ama regatta a year and quite probably more minor events. It is possible the rowing MAADI Cup would be held at the course every three years which would introduce between 80 000 to 100 000 bed nights over the event. It is suggested that the number of events will bring in thousands to tens of thousands of bed nights every average year. By ensuring the course meets International standards, events like the international masters rowing regatta are able to be held in the future as the course becomes more established. This would bring thousands of people, both competitors and their supporters to Nelson for at least a week, with at least some of these remaining in New Zealand for up to a month .

What concerns have been raised to date?

Iwi – Discussions with Iwi have raised concerns that archaeological evidence has shown there are historical sites and urupa (cemeteries) on Rabbit Island (Moturoa). Information to date suggest that these are on the edges of the island however over the next couple of months there will be further investigations , and we have requested that we are kept informed by the Iwi to ensure that we do not dishonour or threaten these sites, and if possible enable any findings to be protected within the environs of the course

Residual herbicide – The issue of residual herbicide which was disposed of on the island in the past has been raised recently. The trust is endeavouring to establish where this “dump” is and even if it is in the area which will be excavated. The concern was that disturbing this area would result in the herbicides leaching into the estuary and causing ecological harm. The Trust is seeking information on this issue, but based on previous information published in the press, it is suggested that if the herbicide was going to leach it would have done so already or at least be in the process of doing so. In addition it is suggested that if there is residual

herbicide discovered in the area intended for the course it should be dealt with sooner rather than later. The half life of DDT is suggested to be between 56 days in lake water, 28 days in river water; estuaries are thought to take longer and 2 to 15 years in soil (USA EPA 1989, Augustijn-Beckers et al., 1994.) The herbicides were apparently discarded in the mid 70's which is 35 years ago. Therefore at worst there is approximately 25% of the original DDT residue still in place.

Environmental concerns – There has been mention of “environmental concerns” by some regarding the proposal. These concerns have not been refined or identified in any way so it is difficult for the Trust to address any specific issues. However it has attempted to give its views of environmental issues below. These views are suggested following a brief review of information available in the public domain however it is likely that some important information has not come to light at the time of writing which will assist in addressing issues in the future.

Environmental considerations for the proposed TAMD course on Rabbit Island (Moturoa)

Introduction

As pointed out in the section “What concerns have been raised to date” it is hoped that the Trust has covered the general facets of the environmental aspects being influenced by the proposed course. The Trust has not undertaken a full study on the environment (as it will be part of the study undertaken by an independent consulting company in the near future) Therefore at this point it is quite possible that there are some facets missing which will have to be addressed in the future.

This brief outline will identify and make suggestions as to what the Trust has considered to date and possibly where they believe the priorities should be.

History

Since European occupation Rabbit Island (Moturoa) has been used for recreational purposes of the people of the Nelson Tasman area. Its original form of sand dunes and low scrub(and the introduction of rabbits in 1865) allowed for shooting and picnic excursions, either by boat or by dray at low tide. The long hard flat beaches were also favoured for horse racing

Parts of Rabbit and Rough Islands have in the past been set aside for gravel extraction and at one time as a Quarantine site for animals entering the area. This was shortly after passed over as it was deemed too easy for stock to escape from the island. In 1909 the whole island was set aside for recreational purposes

This was changed in 1920 when the majority of the island was passed from recreation to plantation use, with only the part taken by the Domain being set aside. Forestry planting has carried on since to act as erosion control.

The bio-solid project was started in 1996 after large scale trials showed the benefit to forestry of spreading these solids. There will be no need for the bio-solids project to stop. It would enhance the natural vegetation growth anticipated for the course significantly.

The Proposed Site.

To reiterate - The site is proposed to be situated on the western end of Rabbit Island (Moturoa) set in at least 150m from the edge of the present pine tree line. The course will itself be 2.5km long and 135m wide for the most part. An extra area of 750m long and 50m wide will run parallel to the course at the starting end with a small island (1m to 2m wide) separating the centre of the water bodies. The water bodies will be connected at each end of the small island. The course will be surrounded by a mound of spoil from the excavations to a height of approximately 6m high and shaped in the main in a terrace shape. Native vegetation will be planted on this spoil and surrounding it. It is intended to fill/empty the course via a canal joining the estuary close to Mapua.

The Trust recognises that it is the perimeter of the island which is enjoyed by walkers and mountain bikers. There are no unique features of the pine forest to entice the public into the more secluded forested areas. There will of course be ample forested area left unaffected, in fact the majority of the island, for those who do enjoy walking amongst pine forest.

Careful thought has been given to how the existence of the course would impact on existing users of the island. Clearly there would remain large tracts of forested areas and no visual impact on the perimeter of the island or its beaches. The course will be set back from the coast by more than the length of a rugby field (including the dead ball area) with this area being vegetated.

The Present Terrestrial Vegetation

The site is a well established pine forest. It has some grasses and a limited understory. No native trees have been seen in the proposed area except along the roads and gaps in the pine where there are a few scrub, sedge and grass species.

The Trust suggests that the loss of this habitat will have greater economic connotations than ecological. It is felt that a planned replacement of the pine forest around the course by selected native species would enhance the terrestrial invertebrate diversity and density. This would provide a more favourable habitat for birds, which are no longer found on the island due to the undesirable pine forest.

The Terrestrial Invertebrates

The Trust has not found any documents pertaining to the species diversity of the terrestrial invertebrates on Rabbit Island (Moturoa) however it stands to reason that the diversity of any native fauna in a monoculture of exotic tree species which generate exceptionally high acidic soils must be poor when compared with a native forest, scrubland or wetland. Further more it is highly unlikely that any rare or endangered species of invertebrate would be found in this present habitat. The species that are found there would surely be enhanced by native diversification of the Flora and Fauna.

The Reptiles

The pattern of discussion must follow that of the invertebrates in that the diversity within the forest must be limited at best and can only be enhanced by selected native planting. It is believed that there are possibly six skinks or Geckos which would be found on the island if it had native forest on it.

The Birds

There is no doubt that Rabbit Island (Moturoa) and the associated estuary is an important ornithological site particularly for water associated birds. From 1958 to 1984 there were 52 estuarine species and 25 non-estuarine species found associated with the Waimea inlet (Owen & Sell, 1985). Oliver (1974) mentions a similar range of species. The majority of the bird species are associated with water, wetlands and the dunes. It is suggested that the Pine forest plays little, if any part in the enhancement of the present bird population except for the primarily terrestrial species which may forage for what invertebrates there are and seeds from the grasses. The table in Annex 3 lists the birds that we believe will be found around the estuary. This list may not be comprehensive but inferences can be made as to the type of habitat they require and if the proposal may or may not have an influence on their future or re-establishment on the Island. The information is taken mainly from Owen (1985). Owen reported "Seventy-five species were recorded: 52 estuarine species on the tidal flats and saltmarsh and 23 non-estuarine species on the inlet and its immediate shoreline. For the estuarine species, the frequency of sightings, use of tidal zones, numbers of birds, seasonal changes in numbers, distribution, breeding status, and habits are given. The numbers of birds at the inlet were highest from March to June in 1977 and 1978, owing to a winter increase in numbers of the South Island Pied Oystercatcher (*Haematopus ostralegus*), Southern Black-backed Gull (*Larus dominicanus*) and Red-billed Gull (*L. novaehollandiae*). Of the Northern Hemisphere migratory waders in summer, the most common were the Bar-tailed Godwit (*Limosa lapponica*) and the Knot (*Calidris canutus*)." It is felt that with the correct environmental engineering the coastal birds will not be adversely influenced and the terrestrial birds will be enhanced.

The Marine Fauna

Invertebrates

There have been at least 112 marine invertebrates recorded in the estuary (Cromarty & Scott, 1995) however there have not been any records of rare or threatened species in this list. The added area of the course will increase the wet surface area if the estuary and if planned properly could be used to provide a habitat for a specific group of invertebrates.

Fish

There have been 41 (Cromarty & Scott, 1995) species of fish recorded in the estuary. These include both marine and freshwater species. The most threatened species are the fresh water species which the course will not affect as it is away from the fresh water areas concerned.

The course will add to the wet area of the estuary and it is suggested therefore that it will enhance the marine finfish habitat if correctly managed.

The Marine Flora

The Trust has not found any indication that there are anything except common species of marine flora in the area that the course will affect. The filling channel is intended to come out in a high flow area so it should not have a major impact on existing flora. With correct planning it is suggested that habitat could be generated where specific flora types may be encouraged to propagate.

The main affected sites

The main area of the estuary affected by the proposed course will be where the feed canal attaches to the estuary. There will be excavations and water flow through this area. An in-depth study will take place on the potential effects in due course.

What are the Negative aspects?

1. Loss of forestry land and revenue - TDC owns 2800 Ha of forestry in the Tasman District of which around 1000 Ha is located on Rabbit Island (Moturoa). The wet area and native surrounds of the course will take approximately 95ha to 115ha (depending on design) including all required green areas and buffer zones, less than 4% of the forested area controlled by the TDC. In 2007 there was: 23,962 tonnes of timber harvested at Rabbit Island (Moturoa)). In 2008: 19,000 tonnes harvested at Kingsland and Rabbit Island (Moturoa).
2. Loss of biosolid disposal area – As previously mentioned the area available for biosolids would be reduced but the replanted Natives would welcome the added nutrient and water of the biosolids program. In their annual report on the project published August 2005, Forest Research reported over 30% volume response to the bio-solids application on 14 year old trees. From a commercial forestry perspective, this is highly significant and potentially of great economic benefit to the forest owners, being the rate payers of the Tasman District. However, Forest Research caution that this extra growth is not without its disadvantages. Lower wood density, larger branches, accumulation of heavy metals in the soil, and deterioration of ground water quality are all potential long-term consequences of continued bio-solids application to the pine forest.
3. Traffic to the island – increased activity on the island will increase traffic on and to the island, with larger amounts during the major events. These would require detailed traffic management planning, especially at the intersection to the state highway, which would be carried out during the design and resource consent stages.
4. Pesticide – the pesticide issue raised above will have to be investigated once the site of the dump is identified
5. Effect on the Estuary – where the filling channel meets the estuary system the water flow will have to be modelled to determine hydrodynamic effect. In addition the

- shoreline adjacent to the entry point will have to be assessed and consideration given to the stability and longevity of it.
6. Erosion – the water flow out of the course may be high particularly after a spring tide. Hydrological effects will have to be assessed and modelled for engineering consideration
 7. Archaeological – This is an important cultural area for Maori and identification of important sites must take place as soon as possible. Should the proposal be in conflict with any site the Trust will be guided by Iwi as to what can be done about it.
 8. Quietness of the Island – There will be motor activity (Vehicle and boat) on the island. The vehicles are already there as are some boats in the traverse and around Mapua. The Trust must remain aware of noise issues and evaluate them.
 9. Carbon Tax for treed area not replanted
 10. There will be maintenance costs associated mainly with the weir system and buildings, however compared to the overall size of the project these would be minimal

What are the benefits?

The Trust believes that there are a number of benefits to the proposal.

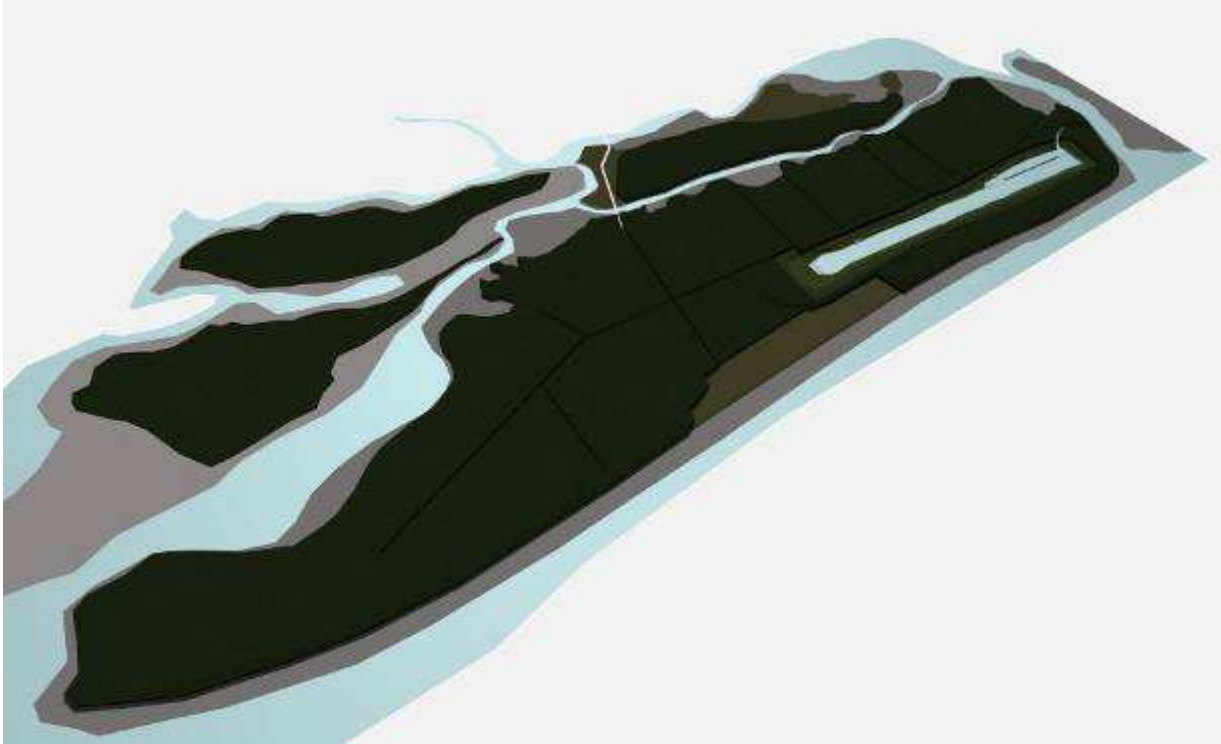
1. The exchange of pine forest monoculture to a more bio diverse native ecology is seen as a net benefit.
2. The extension of the wet area of the Waimea inlet by an estimated additional 35ha. It is conceded that the course, which will flush in a similar pattern to the rest of the estuary when not in use, will be maintained at a high tide level for event duration and this will generate a different habitat to the existing estuary wetlands. However with careful planning and the correct input the generated habitat can be developed for the greatest gains. At no time will the course be allowed to show signs of stagnation.
3. Selected plants can be planted to enhance the desirability of the area to terrestrial fauna, primarily the invertebrates, reptiles and avian species.
4. Walkways and paths can be incorporated around the course to facilitate tramping, bird watching and picnicking.
5. The improved availability of sport facilities and access/participation of the local, regional and national youth to it will be significant.
6. The provision of a world class facility which will bring in significant numbers of national and international visitors to the region.
7. The provision of facilities for physically disabled people of all ages to participate in aquatic sports will be among the few not just nationally but internationally.
8. The provision of aquatic facilities to non sporting activities such as sea scouts and water safety training will also be important.
9. It is suggested that income generated by events will more than cover the running costs of the facility.

Conclusions

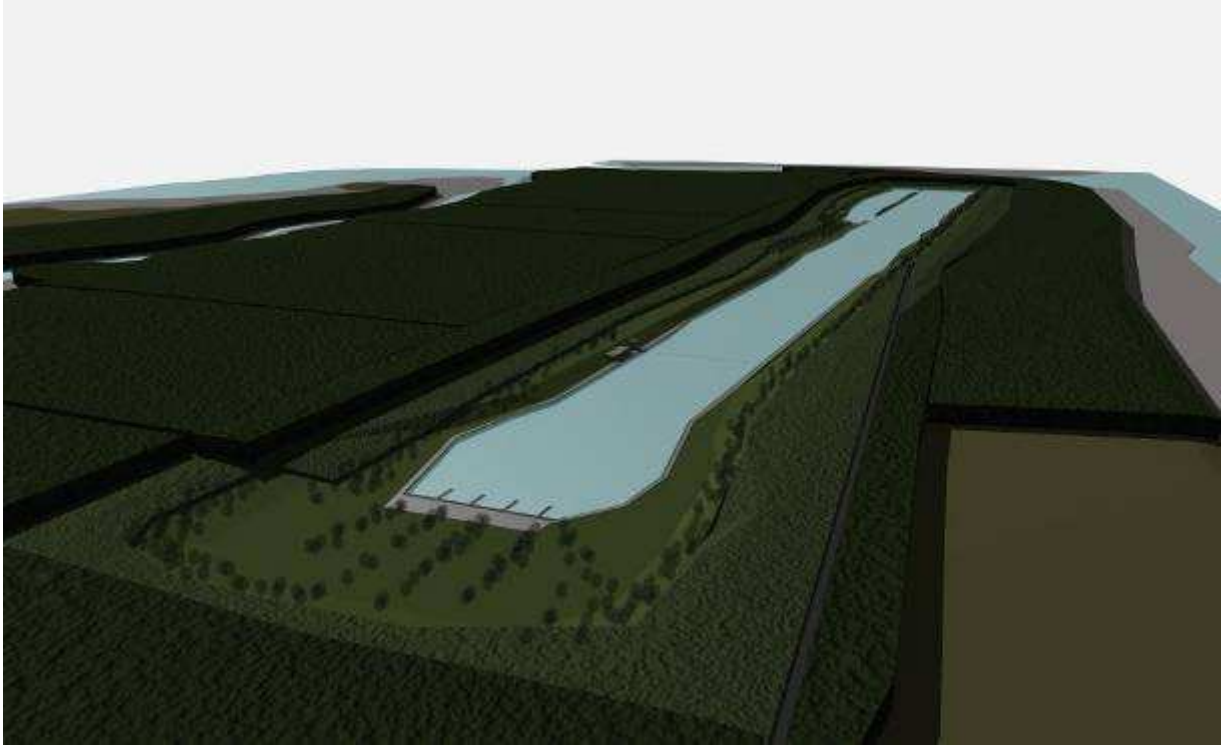
It is felt that the “wet area” and peripheral vegetation of the estuary are of primary importance in terms of the ecology of the system. The modified monoculture of pine on the island is of little ecological importance to New Zealand fauna and the area. Indeed it could be considered a net negative in terms of ecological diversity within the estuary. In addition the facilities will encourage youth to get active, sports and sports men and woman to develop, tourism to increase, and provide a native parkland habitat for the casual walker and visitor.

Annexure 1 – Diagrams of the proposed course

Picture 1 – the suggested position and to scale size of the course. The position may change for a number of reasons ranging from Iwi cultural sites to underground pipes.



Picture 2 – A closer view of the course showing the suggested structure. The finishing line and boat launching area in this end of the course and the start and waterskiing course it at the far end. The area to the right (in brown) is the present picnic and recreational area on Rabbit Island (Moturoa).



Annexure 2 – the costs

The spoil which will be removed from the course (taken from average ground level down is estimated at the flowing:

■ Main course	812,700m ³
■ Movement lane	111,800m ³
■ Race run over area	94,500m ³
■ Start collection/warm-up/skiing	93,750m ³
■ Water feed channel & weir	22,500m ³
■ Estimated total spoil from ground level down	1,135,250m ³
■ @ an estimated \$3.10/m ³	<u>\$3,519,275.00</u>

Initial investigations carried out on site show no signs of gravel being present at the depths the course will run, in the area presently being considered. The investigations showed mainly estuary/ beach deposits of sand and shell.

Additional costs are estimated or undefined (these will be defined in the latter stages of the feasibility study)

■ Weir construction (estimated)	\$400,000
■ Possible clay sealing or Liner (this is a precaution, preliminary studies suggests that this will not be needed but just to be safe....)	cost unknown
■ Landscaping and planting indigenous vegetation	cost unknown
■ Environmental planning (in case we can target single species or fauna group enhancement)	cost unknown
■ Car park – possibly 500 vehicles	\$240, 000
■ Boat stacking area / shed	\$115, 000
■ Facilities (Potable water, electricity and toilets)	cost unknown
■ Resource consent	costs unknown
■ Contingency	10%
■ Program management	costs unknown
■ <u>Total costs (exc GST)</u>	<u>\$4,274,275.00 plus the unknowns</u>

Annexure 3 - A list of most of the birds found in the Waimea area in 1985

Table 1

Species
Australian Gannet
Black-backed Gulls
Red-billed Gulls
Black-billed Gulls
Black-fronted Terns
Caspian Terns
White-fronted Terns
White-Winged Terns
Black Terns
Little Terns
South Island Pied Oystercatchers
Variable Oystercatchers
Pied Stilts
Black Stilt
Sharp Tailed Sandpiper
Turnstone
Siberian Tattler
Banded Dotterels
Black-fronted Dotterel
Wrybill
Far Eastern Curlew
Greenshank
Whimbrel
New Zealand Dotterel
Eastern Bar-tailed Godwit
Red Knot
Ruddy Turnstone
Black Shags
Pied Shags
Little Shags
Little Black Shags
Spotted Shag
White-faced Herons
Reef Herons

White Herons
Little Egret
Royal Spoonbills
Pied stilt
Australasian Bittern
Banded Rail
Marsh Crake
Pukeko
Spur-winged Plover
Least Golden Plover
NZ Scaup
Grey Teal
Western Weka
South Island Fernbird
New Zealand Pigeon
Morepork
NZ Kingfisher
South Island Fantail
Grey Warbler
Silvereye
Bellbird
Tui
South Island Robin
South Island Tomtit
Brown Creeper
Pigeon
SI Rifleman
New Zealand Kingfisher
New Zealand Pipit
Chaffinch
Goldfinch
Redpoll
Greenfinch
Sky Lark
Yellow Breasted Tit
Hedge Sparrow
House Sparrow
California Quai
Yellow Hammer
Song Thrush

Represents birds that would probably benefit most from the terrestrial environmental improvement

52 were estuarine species observed on the tidal flats and saltmarsh and 23 were non-estuarine species observed at the inlet and on the immediate shoreline.

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