

**BEFORE THE ENVIRONMENT COURT
AT AUCKLAND**

IN THE MATTER of the Resource Management Act
1991 ("the Act")

AND

IN THE MATTER of an appeal pursuant to Clause 14 of
the First Schedule of the Act

BETWEEN **CATO BOLAM CONSULTANTS
LIMITED**
(ENV-2007-AKL-000188)
(ENV-2007-AKL-000190)
(ENV-2007-AKL-000187)

AND **CITADELTOWERS
LIMITED**
(ENV-2007-AKL-000218)

AND **ENVIRONMENTAL DEFENCE
SOCIETY**
(ENV-2007-AKL-000206)

AND **AUCKLAND REGIONAL COUNCIL**
(ENV-2007-AKL-000213)

AND **HAKA INTERNATIONAL LIMITED**
(ENV-2007-AKL-000213)

Appellants

RODNEY DISTRICT COUNCIL

Respondent

STATEMENT OF EVIDENCE OF SHONA CLAIRE MYERS

AUCKLAND REGIONAL COUNCIL

INTRODUCTION

1. My full name is Shona Claire Myers. I hold the degrees of Bachelor of Science and Master of Science (First Class Honours) in ecology and botany. I have had 26 years experience as an ecologist, and have been employed by regional and central government agencies. I have previously been employed as a scientist with the Department of Scientific and Industrial Research, a Conservation Officer (Protected Ecosystems) with the Department of Conservation, and as a Natural Heritage Scientist and Team Leader Natural Heritage with the Auckland Regional Council (ARC).
2. My particular areas of expertise include lowland forest, riparian and wetland ecology, and the development of ecological survey methods. Over the last 26 years I have worked at both a national and regional level on aspects of the protection and restoration of New Zealand's lowland biodiversity. I have been involved in the development of the Protected Natural Areas Programme methodology, the national Wetlands of Ecological and Representative Importance (WERI) wetland database, the implementation of ecological survey and monitoring methods for Department of Conservation, and the implementation of national and regional wetland policies. At ARC I have been involved in co-ordinating regional ecological surveys and inventories, and providing advice on and developing regional biodiversity and heritage policies. I manage teams undertaking heritage and biodiversity conservation on public and private land, including habitat restoration and species conservation on regional parks and open sanctuaries. In 2000 I was a member of the Ministerial Advisory Committee on Biodiversity on Private Land; in 2005 and 2006 I advised on national biodiversity research funding; in 2007 was involved in the development of the Threatened Environments Classification, and in 2008 provided assistance to Ministry for the Environment on the development of national guidelines on biodiversity management. I have recently provided advice on the review of the heritage and biodiversity chapters of the Auckland Regional Policy Statement. As a member of the Regional Council Biodiversity Managers Group, I co-ordinate and work with managers from other regional councils in New Zealand. I am the immediate past President of the New Zealand Ecological Society.
3. I am currently employed as Group Manager Heritage at the ARC. In this role I manage the natural and cultural heritage teams and the implementation of regional ecological, cultural and archaeological survey and monitoring, regional heritage advocacy and protection, and Regional Park heritage restoration and conservation.

4. I am authorised to give this evidence on behalf of the ARC. I have read the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Consolidated Practice Note 2006 and agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this statement of evidence are within my area of expertise.

SCOPE OF EVIDENCE

5. I appear in support of the ARC's appeal on the Proposed Rodney District Plan 2000 (the proposed district plan) Subdivision for Enhancement Planting (SEP) provisions within the East Coast Rural, Dune Lakes, Landscape Protection Rural and Kawau Island (Bush Policy Area) zones. For the purpose of my evidence these zones, when grouped together, are called 'the sensitive rural zones'. The Landscape Protection Rural Zone contains the Te Arai area which has been subject to a previous specific development proposal, through a proposed private plan change, which ARC opposed.
6. The SEP provisions in the proposed district plan allow further subdivision and associated development in these zones in exchange for enhancement planting that meets identified criteria and standards. The RDC position, as outlined in the evidence of Ms Burnette O'Connor, presents modifications to the SEP rule, as it would apply to these sensitive rural zones. My evidence is in reference to this RDC position. For the background of proceedings related to this appeal, as well as ARC's involvement, I rely on the evidence of Mr Hugh Jarvis for the ARC.
7. In my evidence, I will describe the ecological values in these sensitive rural zones and the potential ecological impacts and the threats of subdivision and associated development in these areas. The benefits and disadvantages of enhancement planting are discussed in particular assessing the potential ecological benefits of revegetation planting when weighed against the potential disadvantages or adverse effects of development. The appropriateness and ecological effectiveness of enhancement planting in areas within these sensitive rural zones is discussed. Finally, I discuss methods to ensure that the values of these sensitive rural zones are not inappropriately compromised by subdivision and associated development and that any enhancement planting results in a clear ecological benefit.
8. My evidence will address:
 - The ecological values within the sensitive rural zones;

- The ecological impacts of subdivision and development on these zones;
- The ecological impacts specific to Te Arai;
- The benefits and disadvantages of enhancement and revegetation planting;
- Regional experience with enhancement planting;
- Requirements to protect and avoid significant impacts on sensitive ecological values of these zones, and
- Methods to ensure ecological benefits are gained from enhancement planting.

ECOLOGICAL VALUES WITHIN THE SENSITIVE RURAL ZONES

9. Within and adjacent to the East Coast Rural, Landscape Protection, Dune Lakes, and the Kawau Island (Bush Policy Area) Zones are habitats and ecosystems with significant ecological areas and wildlife values. These sensitive rural zones contain a significant diversity of regionally and nationally important ecological values, including habitats for threatened species. The Statement of National Priorities for Protecting Rare and Threatened Native Biodiversity (Ministry for the Environment and Department of Conservation 2007) identifies the types of ecosystems and habitats in need of protection. National priorities include: protecting indigenous vegetation in land environments that have less than 20 percent or less remaining in indigenous cover; indigenous vegetation associated with dunes and wetlands; and habitats of threatened and declining indigenous species. The sensitive rural zones contain a number of natural heritage areas and resources identified as nationally and regionally significant, including wetlands, dunes and habitats for nationally and regionally threatened species. Significant areas in these zones are identified in Appendix B of the Auckland Regional Policy Statement (ARPS), the Auckland Regional Plan: Air, Land and Water Plan, the Auckland Regional Plan: Coastal, and as Significant Natural Areas in the proposed district plan. Maps identifying these areas are found in Appendix 1. I note that these maps are not exhaustive and only contain areas identified in existing planning maps. There will be other significant natural areas that lie outside of these, which meet regional criteria for ecological significance. I will now describe the ecological values within each of the sensitive rural zones.

East Coast Rural Zone

10. The East Coast Rural zone, being approximately 9,800 ha, is adjacent to and contains regionally significant ecological values including coastal and lowland forest remnants, estuaries, wetlands, harbours, and undeveloped coastline. Sites such as the Regional Parks at Wenderholm and Tawharanui have established open sanctuary restoration projects with many natural heritage values protected through the significant resources invested in managing these areas. Land in close proximity to these areas of high ecological value act as buffer zones that protect these projects from threats brought about by development such as habitat loss and degradation. The Wenderholm Regional Park is within the area that includes Waiwera and Puhoi where a complex array of forest and estuarine habitats supports a variety of native animal and plant communities. The area provides a buffer to the habitat at Wenderholm. The native forest habitats outside of the regional park form linkages for dispersers and pollinators essential to maintain ecosystem processes at Wenderholm. The low level of development surrounding the Tawharanui Regional Park provides a buffer of protection to fauna and flora values which are under restoration. The distance from threats such as human disturbance and household pets provides greater assurance of the security of threatened species such as kiwi and pateke that have been translocated to the Tawharanui Open Sanctuary.
11. Other areas which are particularly sensitive include the Mahurangi and Whangateau harbours and the surrounding catchments, and the Cape Rodney – Goat Island coastline and Ti Point area. The Mahurangi Harbour contains significant estuarine ecosystems and intact sequences from estuary to coastal forest. The Whangateau Harbour contains the best example of lowland kahikatea swamp forest left in Auckland. It is part of an intact vegetation sequence from estuarine salt marsh to forest. These sequences are now very rare. The Cape Rodney and Ti Point coastline contains significant coastal forest remnants and adjoins a sensitive coastal environment and marine reserve.

Landscape Protection Rural Zone

12. The Landscape Protection Rural Zone, being approximately 6500 ha, contains significant ecological and wildlife values on both the east coast and on the west coast at Muriwai. These include remote and undeveloped dune systems, wetlands, coastal vegetation and coastal forest. The land at Te Arai lies within this zone. The coastline from Mangawhai to Pakiri is regionally and nationally significant for its sand

dune ecosystems and threatened wildlife values. Sand dunes are a nationally threatened ecosystem type that has been reduced significantly from their former extent in New Zealand and the Auckland region. Over two thirds of the region's active dunelands have been lost since records were collected in 1950 (Hilton 2000).

13. On the west coast the Landscape Protection Rural Zone is adjacent to the Waitakere Ranges and contains significant ecological values including coastal vegetation, wildlife values and coastal pohutukawa forest at Muriwai. It also includes the catchment draining into the northern section of the Te Henga wetland, the largest most significant wetland on the mainland of the Auckland Region.

Dune Lakes Zone

14. The Dune Lakes Zone, being 3,050 ha, includes lakes along the length of South Kaipara Peninsula and on the east coast south of Mangawhai. The complex of dune lakes in Rodney is regionally significant and contains significant wetland and riparian vegetation and provides significant habitat for threatened wildlife. The Tomarata dune lakes are impounded by Holocene dune sands. Lake Tomarata on the east coast has a dense fringe of native emergent wetland vegetation and is the only known location of the peat-forming wire rush (*Empodisma minus*) in the Auckland Region. Despite the recent reduction in water quality of the lakes, they remain significant as the only east coast dune lakes in Auckland and for their habitat for native birds, including threatened species. Bird species around the lakes include banded rail, Australasian bittern and North Island fernbird. Caspian terns have been reported from Lakes Slipper and Spectacle.
15. On the West Coast, extending along the length of the South Kaipara Peninsula is a string of approximately 33 lakes. This extensive system of lakes is regionally significant in that it provides an open, shallow freshwater habitat for a number of threatened species of wildlife as well as for more common ones. The larger, more permanent lakes - Kereta, Kuwakatai, Ototoa, and Okaihau - have become of critical importance to wildlife. Wetland bird species present in the dune lake area include bittern, fernbird, NZ scaup, and spotless crake. The Ornithological Society of New Zealand has noticed a decline in the number of New Zealand scaup over the last few years. Lake Kereta has been recorded as the best breeding area for dabchick in the Auckland Region and the South Kaipara Peninsula is one of the very few areas in the Auckland Region where there is a significant breeding population of this threatened native bird.

16. Lake Ototoa, the largest of the Kaipara dune lakes, has a wetland margin and is bordered on one side by the largest area of coastal broadleaved forest on the South Kaipara Peninsula in Lake Ototoa Scenic Reserve and Ototoa Stewardship Area. Lake Ototoa is the only natural lake within the Auckland Region with unmodified native submerged vegetation and has been ranked as having the highest water quality and clarity of all the Auckland lakes. The coastal forest provides a substantial buffer to the northern and western lake margins, and is one of the best remaining forest sites in the Auckland Region portion of the Kaipara Ecological District.

Kawau Island Zone (Bush Policy Area)

17. Kawau Island, being 2,058 ha, is situated in the Hauraki Gulf, north of Auckland, 1.6 km south of Tawharanui peninsula on the east coast. The island provides habitat for a number of threatened species, and lies in close proximity to the mainland of the Auckland region. Kawau Island contains nationally and regionally significant conservation values. Much of the island is covered with native kanuka forest growing to the coastal edge. The kanuka forest is relatively continuous and extends across approximately 86% (1,777ha) of the island. Remnants of original coastal pohutukawa forest, broadleaved forest and kauri forest occur on headlands, coastal escarpments, and in gullies on the island, and cover approximately 6%. Saline and freshwater wetlands are present in the major catchments.
18. The island's ecology is impacted by animal pests (including ship rats, stoats, possums and wallabies) and by the invasion of weed species. Wallabies have eaten out much of the understorey of the forests on the island and are inhibiting natural regeneration. The island's ecology has significant potential to recover and to regenerate with the control and eradication of these pests.
19. Kawau Island has at least 15 nationally threatened plants and animals, and provides an important habitat nationally and regionally as a habitat for threatened endemic fauna, including kiwi, weka and brown teal. This includes two-thirds of the entire remaining population of North Island weka, and the national stronghold for the critically endangered endemic native plant, sneezeweed (*Centipeda minima*).
20. Islands provide significant habitats for these endangered fauna as they often do not contain key predators (such as rats and mustelids) which are widespread on the mainland. They are also isolated from the pressures of human settlements, and associated use, development and impacts. Kawau Island provides excellent

potential for ecological restoration, primarily through eradication of mammalian pests. The ARC has a comprehensive plan for control and eradication of pest species on Kawau Island under the Auckland Regional Pest Management Strategy 2007-12 (RPMS). There is an existing programme of possum control undertaken by the Pohutukawa Trust and many landowners with the assistance of the ARC, and possums have been at low levels for over 20 years. The RPMS identifies the intention that wallabies will be eradicated from the island within the life of the strategy. ARC has also been controlling and eradicating key pest plants on Kawau Island since at least 2000. The island could potentially support a significant proportion of the regions biodiversity because it is large, and dominated by indigenous landcover. This contrasts with many other large islands, which are dominated by farmland, require intensive and extensive revegetation and weed management, and have relatively low biodiversity value.

Te Arai

21. The Te Arai area lies within the Landscape Protection Rural Zone. I will discuss the specific values of the land at Te Arai, due to the particularly unique and significant ecological values there. The Te Arai area is located in the central region of an area of coastline that covers Mangawhai to Te Arai Point and which is extremely important to several threatened endemic species. The coastal dunes and beach system at Te Arai is of regional and national ecological, wildlife and heritage significance. More details on the wildlife values of the Te Arai land and impacts on these values are provided in the evidence of Dr Mark Bellingham.

22. Mangawhai Sandspit which abuts Te Arai to the north is the most important breeding site in New Zealand for the New Zealand fairy tern and supports the largest concentration of breeding pairs. The Mangawhai sandspit is also one of the most important breeding sites and the largest flock site for northern New Zealand dotterel. Forty to 45 pairs of this species breed between Mangawhai Sandspit and Te Arai Point, making this area nationally and internationally important to this species (Dowding 2006). The area is also of national significance for Caspian terns (*Sterna caspia*), ranked as Nationally Vulnerable, with two to four percent of the population breeding on Mangawhai Sandspit and banded dotterel (*Charadrius bicinctus bicinctus*), ranked in Gradual Decline also breed in the area. The Te Arai Stream area is of national significance to New Zealand dotterel with eight to nine pairs present over the breeding season. The stream mouth is also of international significance as a flock site for New Zealand fairy tern with 15-35% of the world's population roosting here after the breeding season. The Te Arai Stream is used by

species including Caspian terns, variable oyster catchers and shag species for feeding.

23. Shore skinks (*Oligosoma smithi*), which are rarely found on the mainland and the katipo spider (*Latrodectus katipo*), ranked in Serious Decline, have also been found in the dunes at Te Arai beach.

24. The Te Arai fore dune is primarily native in character, being covered in the native sand binders spinifex (*Spinifex sericeus*) and pingao (*Desmoschoenus spiralis*) and contains a number of nationally threatened plant species. While the dune is far from pristine, it is native in character, it is one of the least modified in the region, and retains high natural character. Pingao is a nationally threatened sand binder (de Lange *et al.* 2004) and is now only sparsely found in the region. The sand dune kanuka, *Kunzea ericoides* var. *linearis* is present on the roadside on Pacific Road and along the sides of the Te Arai stream. Golden Sand Tussock (*Austrofestuca littoralis*) is a nationally threatened (Gradual Decline) sand grass which only remains on the mainland of Auckland at Pakiri and Te Arai. *Coprosma acerosa* is a nationally threatened dune shrub which occurs in higher densities than at any other dune in the region. In Auckland the two strongholds for it are the remote and uninhabited beaches of the South Kaipara Head and Te Arai. It is noted that the sand dunes at Te Arai are covered in pine trees at present. The dunes are valuable (as a substrate and intact physical landform) as they are able to be restored if pines are removed. I acknowledge that pines were originally planted on the dunes to prevent sand dune erosion and that there is a covenant in place that requires protection of sand dune stability. Any plans to remove the pines would need to be part of a restoration plan that is integrated and ensures protection of the sand dunes and of the adjoining farmland.

ECOLOGICAL THREATS OF DEVELOPMENT WITHIN ZONES

25. Threats from subdivision and development to the ecological and wildlife values within the sensitive rural zones include fragmentation and loss of habitat, loss and disturbance of threatened species, downstream impacts on estuaries, wetlands and the marine environment, and impacts from increased threats from animal and plant pests, and domestic pets. The pressures of coastal subdivision and the associated threats that people bring to these areas have already resulted in loss of habitats and species extinctions within these sensitive rural zones. I consider development which adversely impacts on the sensitive values of these zones should be avoided.

26. The ecological values of these zones have been partially protected to date by limited subdivision and development; and in many cases, including Te Arai, the Tawharanui Peninsula, and the Dune Lakes Zone, by being relatively remote from human settlement and disturbance. The ecological and wildlife values in these areas rely on limited disturbance by humans and impacts of associated development such as fragmentation of habitats and increased weeds resulting from subdivision activities. The provisions in the proposed district plan need to ensure protection of these values, ensure long-term ecological benefits from enhancement planting, and not allow subdivision and enhancement planting benefit in areas where it is not appropriate.
27. Increased subdivision and development leads to increased threats from plant and animal pests. Competition with weeds is one of the contributing causes of the extinction of plant species and loss of viability of forest and coastal ecosystems. It has been shown that the number and abundance of exotic weeds in New Zealand coastal native forest fragments correlates with the distance to the nearest town (Sullivan *et al* 2005). The majority of New Zealand environmental weeds were originally garden plants (Lee *et al* 2000). Native fauna are vulnerable to disturbance from humans and from animal pests including mustelids, possums, and rodents. Domestic pets provide a significant threat to ground dwelling native fauna.

East Coast Rural Zone

28. The estuaries and harbours on the east coast of Rodney, including Whangateau and Mahurangi contain regionally significant ecological values and are especially vulnerable to the downstream impacts of development, and loss and fragmentation of riparian vegetation. Tawharanui Open Sanctuary and the Wenderholm Regional Parks are especially vulnerable to impacts on fauna and threatened species and rely on significant buffers to protect these values.

Landscape Protection Rural zone

29. Threats from subdivision and development in this zone include loss of habitat and disturbance of threatened wildlife and potential extinction of species. The Te Henga wetland is threatened by nutrients from runoff, fragmentation, and loss of riparian and wetland vegetation.

Dune Lakes Zone

30. Dune lakes and wetlands are threatened by increased pollution and nutrients from runoff, by fragmentation and loss of riparian vegetation, and by increased human disturbance of wildlife values. The most significant lakes contain significant riparian vegetation and show the least impacts from animal and plant pests, including exotic pest fish.

Kawau Island Zone (Bush Policy Area)

31. On Kawau Island, much of the island is relatively undeveloped with an intact cover of indigenous vegetation. Large areas of forest with intact ecotones, and intact catchments are now rare in the mainland of the Auckland Region. Further subdivision, use and development will result in ecosystem loss, fragmentation, degradation, increased spread of plant and animal pests, and impacts on streams and wetlands. This will lead to a reduced capacity of ecosystems to support populations of threatened species, including kiwi and pateke. Undisturbed catchments are important for the long-term survival of threatened species.

Threats specific to Te Arai

32. The main wildlife and ecological values of this area are located at the coast and the major threats to these species are human disturbance and predation by introduced mammalian pests. Disturbance from people, vehicles and dogs during the breeding season can cause birds to leave their nests for prolonged periods of time, when eggs need to be kept warm or protected from overheating by the sun. Beach users can also inadvertently crush the well camouflaged eggs. Chicks are unable to fly for the first several weeks of their lives and therefore cannot easily escape impacts from recreational use of their beach habitat or predators. Fencing, signs and advocacy can be used to combat this threat; however human impacts are very unpredictable. The degradation and loss of coastal habitat due to development also restricts the abundance of these species. Recovery Plans of both New Zealand dotterel and New Zealand fairy tern list protection from development as one of the actions for recovery (Dowding and Davis, 2007; Hansen, 2006).
33. Te Arai is geographically connected to Mangawhai Sandspit. It is therefore reasonable to expect that impacts on the environment at Te Arai will also impact upon the Mangawhai Wildlife Refuge, where conservation management has been implemented to protect fairy tern and also provides protection for other threatened species including those mentioned above. Te Arai is extremely important for expansion of species that are recovering due to conservation efforts elsewhere. This

includes the fairy tern, which has been observed prospecting for nest sites, courtship feeding and foraging for food at Te Arai stream mouth (Gwenda Pulham pers obs 2007, 2008). Increased levels of disturbance at Te Arai are likely to make the area unsuitable for threatened species thereby restricting possibilities for their expansion.

34. Human disturbance also creates pressures on threatened plant species. The pressures of coastal development and the threats that people bring to these sensitive ecological systems (such as, trampling, use of recreational vehicles, horse riding) has already resulted in destruction of sand dune habitats and local plant extinctions from the region. Competition with weeds is one of the contributing causes of the extinction of several dune species from the region.
35. Dune systems and the flora and fauna that inhabit them are adapted to large-scale movement of sand. Unmodified dunes are usually several kilometres deep. They are inherently dynamic. A self-sustaining dune community relies on large areas of open and shifting sand. Development will fragment potential habitats on the undeveloped areas at Te Arai.

SIGNIFICANT ENHANCEMENT PLANTING

What is enhancement planting?

36. The SEP rule in the proposed district plan provides incentives for subdivision in exchange for planting native species to create a forest, shrubland or riparian habitat. Under the RDC position, in the sensitive rural zones, enhancement planting would be linked with the concept of a valuable ecological benefit, as defined in Chapter 3 of the proposed district plan.
37. Revegetation or enhancement planting is the planting of native plants at a disturbed site in order to simulate natural succession to achieve a self-sustaining vegetation community (Stanley, 2009; Evans, 1983). Planting usually requires eco-sourced native plants, sourced from the local area, and plants appropriate to a site. Appropriate native plants are those that grow in local natural vegetation. Quick growing, hardy, early successional plants (for example, manuka, kanuka, *Coprosma* spp, mahoe and mapou) are usually used. The intent is to kick start a self-sustaining native ecosystem for environmental benefit.
38. Riparian planting involves planting of native trees, shrubs, rushes and sedges beside streams, wetlands and coastal margins to provide habitat, shade, filtering of pollutants and nutrients, stabilising of eroding slopes, improve water quality, and to

protect downstream ecological values. The ARC riparian management guide (ARC, 2001) provides guidance on the appropriate plants to plant and the width of riparian planting.

39. Under rule 7.14.4.2 the proposed district plan provides for subdivision in exchange for significant enhancement planting. A minimum of six hectares of planting is required for each new rural residential site where the planting will provide a valuable ecological benefit. A minimum of 10 ha is required for the first site where the planting will not provide valuable ecological benefits within the General Rural Zone. In the East Coast Zone, Landscape Protection Rural and Dune Lakes zones the RDC position proposes that significant enhancement planting be provided for only where it provides a valuable ecological benefit. In the Kawau Island Zone (Bush Policy Area) the RDC position is that rule 7.14.4.2 applies. A valuable ecological benefit is defined in Chapter 3 of the proposed district plan and requires replanting:

- (i) *a high value ecological connection, being a connection that has a width of at least 40m (and preferably more than 100m) and joins, with no gaps, areas of indigenous vegetation that are each 10 ha or more in the case of terrestrial vegetation, or each 0.5 ha or more in the case of wetlands with the areas of vegetation to be joined being either;*
- *areas of similar mature indigenous vegetation; or*
 - *one area of mature indigenous vegetation and one area of regenerating vegetation that is developing into vegetation similar to that in the existing mature area; or*
 - *two areas of different types of mature vegetation along an environmental gradient (for example, a topographical gradient or a salinity gradient).*

For the purpose of this definition, "regenerating vegetation" has a minimum height of 1.5 metres, contains emerging canopy species and has minimum long term weed management requirements.

or

- (ii) *a high value ecological buffer, being a buffer that extends at least 50m from existing indigenous vegetation edges and surrounds (to the extent practicable) either:*
- *mature terrestrial indigenous vegetation totalling at least 4 ha in area;*
- or*

- *regenerating indigenous vegetation totalling at least 10 ha in area; or*
- *an indigenous wetland at least 0.5 ha in area;*

or

(iii) a high value riparian planting, being riparian planting along at least 200m of a perennial natural watercourse, providing uninterrupted indigenous vegetation. It is at least 20m wide on each side of the watercourse and otherwise complies with Rule 7.14.2.5.

40. The proposed district plan provides native revegetation Planting Standards in Rule 7.14.2.3 and guidelines for native revegetation planting in Appendix 7E.. These provide standards and guidance on the eco-sourcing of plants, choosing plants that are appropriate for the site, the need for a planting plan assessment, site preparation including animal and plant pest control, guidance on plant spacing and achieving canopy closure, and guidelines for maintenance and monitoring. The revegetation planting standard requirements include a 90% survival rate and 75% canopy closure, a density of 1.4 metre centres (5,100 stems per hectare) and 1m centres (10,000 stems per hectare) in kikuyu and wetland environments. Maintenance is required for a minimum of 5 years.
41. I support the concepts set out in the standards and guidelines for enhancement planting and in particular the concept of SEP providing a valuable ecological benefit. It is important, however, to consider whether enhancement planting in exchange for subdivision is appropriate within these sensitive rural zones. It is also important to consider whether enhancement planting provides a significant ecological benefit, whether this benefit is significant enough to allow subdivision in exchange for it, and if the benefits can be achieved within the timeframes and specifications set out in the proposed district plan. Existing examples of enhancement planting can help to inform this discussion. For a discussion on the potential landscape effects of subdivision and development in these zones, I rely on the evidence of Mr Stephen Brown, a landscape architect.

Benefits of Enhancement Planting

42. The Auckland Region's natural environment including the Rodney District has been extensively modified and, as a result, conserving remnant lowland and coastal vegetation and restoring native vegetation and forest, shrubland and wetland

ecosystems is an important role of conservation. Revegetation can provide the following benefits (Stanley, 2009):

- Protects isolated remnants of natural vegetation from weed invasion and wind damage by planting buffers;
- Restores ecological linkages between natural areas;
- Restores fragmented natural areas, and ecological sequences and connections;
- Prevents erosion on unstable slopes and stabilises already eroded slopes;
- Establishes vegetation types which have been depleted, including lowland and coastal forests and wetlands;
- Links habitats with corridors to enhance movement of wildlife;
- Filters water and pollutants;
- Provides riparian buffer; and
- Contributes to climate mitigation and adaptation by protecting and planting carbon sinks.

In many cases, enhancement planting will also have a landscape or aesthetic role rather than an immediate ecological benefit.

43. Native revegetation areas can provide significant ecosystem services. Ecosystem services represent the benefits human populations gain from ecosystem functions. These include erosion control, soil formation, nutrient cycling, filtering and regulation of water flows, and regulation of atmospheric carbon (Constanza *et al*, 1997). Riparian planting provides shade for waterways, filters nutrients and pollutants, and improves water quality (ARC, 2001).
44. I note that revegetation is not the same as ecological restoration, although it may be used as the basis of a restoration project by facilitating the development of native vegetation cover. Ecological restoration is a more ambitious task that considers a more comprehensive consideration of issues such as past ecosystem structure, diversity and processes, restoration or relocation of species, and integrated pest control of a suite of pests.
45. Section 7.8 of the proposed district plan describes the characteristics of zones and policy areas including the sensitive rural zones and sets out the objectives and

policies and the benefits being sought for these zones. These include the following objectives:

East Coast Rural Zone

To protect and enhance natural areas and features, including landscapes, streams, lakes, estuaries, harbours and wetlands (7.8.2.1.2)

Landscape Protection Zone

To protect and enhance wherever possible the high value landscapes, and significant natural areas and features including streams, rivers, lakes, estuaries, harbours and wetlands within the zone (7.8.3.1.2)

Dune Lakes Zone

To protect the landscape and natural character of the land around the Dune Lakes and the high environmental values of the lakes themselves, whilst enabling the area to continue to be used for appropriately located rural based activities (7.8.4.1.1)

Kawau Island Zone (Bush Policy Area)

To achieve control of the wallaby and possum population on the island and to re-establish the ecology of the island (7.8.6.1.2)

46. I support these objectives. Enhancement planting in exchange for subdivision, however, is not the only method or the most appropriate mechanism for achieving them. As described, these sensitive rural zones contain regionally and nationally significant ecological and wildlife values where impacts of development need to be avoided. In my view, relying on subdivision for achieving revegetation planting in these zones is not the right approach. A range of mechanisms need to be used to restore and protect ecosystems in these zones including support for community based planting and restoration programmes on public and private land. The ARC and other agencies support significant community based restoration programmes in Rodney District through non statutory incentives and funding. The Sustainable Catchments Programme led by the ARC includes the Mahurangi Action Plan project and the Whangateau catchment programme which provide funding for stream and coastal edge fencing and riparian planting on private land. The ARC also provides funding for biodiversity protection and restoration through the Environmental Initiatives Fund (EIF) and the Coastal Enhancement Fund. Over 74% of the EIF funding is provided each year for biodiversity projects including wetland and riparian fencing and native revegetation. In the 2008 calendar year EIF provided funding for 14,149 metres of fencing as well as 30,680 native plants for revegetation projects.

47. The ARC's regional parks revegetation programme involves volunteer community planting days with over 70,000 native plants planted by the community each year. This includes over 20,000 native plants planted on Tawharanui Open Sanctuary each year in partnership with the Tawharanui Open Sanctuary Society Inc. The Rodney District Council biodiversity fund also provides funding to private landowners for protection and restoration of native forest and wetlands ecosystems. There is considerable scope and community demand for increasing the support and funding provided for voluntary fencing and planting of riparian areas, wetlands and forest habitats by community groups and landowners.

Disadvantages of enhancement planting

48. The potential benefits of enhancement planting need to be weighed against the disadvantages of increased subdivision and development in sensitive coastal, duneland and wetland ecosystems. Planted native areas can provide ecosystem services such as filtering of nutrients and pollutants, erosion control, and creation of local habitat values. Increased development, however, may lead to loss of species, disturbance of wildlife values, increased weeds, and impacts on the viability and functioning of existing ecological values.
49. The proposed sliding scale in the RDC position has the potential to lead to significantly more subdivision and development on large sites (over 100 ha) within the zones. Larger scale developments have the potential to have significant environmental effects in sensitive areas. As described, this can include fragmentation of habitats, loss of species, increases in the impact of weeds in coastal areas, and increased effects of domestic pets. It also has the potential to allow numerous small scale subdivisions which will lead to landscape wide cumulative environmental effects. Both larger scale developments with significant areas of planting and numerous small scale/single lot subdivisions have the potential to result in significant ecological impacts from development without achieving a significant ecological benefit.
50. Revegetation is not always what is required or appropriate for a site. Every site will be different according to the values of the site, and natural regeneration patterns. Revegetation is not required where natural regeneration patterns are already re-establishing indigenous vegetation cover such as in regenerating shrubland communities, wetlands and dunelands. Strict planting standards are not appropriate where existing native regeneration is developed. In these situations, animal and

plant pest control is more important. In exposed and difficult sites such as in exposed coastal sites and sites with kikuyu, I consider that a staged approach should be taken.

51. Revegetation planting can take a long time for ecological processes to start. The anticipated ecological benefit will therefore not be realised until after development has occurred. Integrating animal and plant pest control as part of the revegetation plan is also critical to its success. Birds are a major vector for moving seeds from nearby vegetation. Animal pest control to promote bird populations will assist increasing plant diversity, and weed surveillance and control will mitigate the impacts of invasive plants. The long-term maintenance and protection of planted areas is required. Revegetation is a long-term process which requires ongoing management and plant and animal pest control. This will be dependent on the landowner to implement and Council to monitor. For a clear ecological benefit to be gained, planting should be undertaken in association with other ecological benefits including restoring riparian buffers, and ecological linkages and corridors, and buffers to existing natural areas.

Experience with Enhancement Planting

52. The ARC Heritage and Parks Departments have extensive experience in undertaking revegetation planting on regional parks. The parks revegetation programme involves 70,000 to 100,000 native plants planted on regional parks each year. The revegetation programme is undertaken in partnership with the community and thousands of volunteers. The revegetation programme concentrates on fencing off and planting gullies, riparian areas, wetlands, coastal areas and buffers to existing natural areas, and creating ecological corridors and linkages. Restoration of habitats through planting of pioneer native trees, shrubs, and dune and wetland plants is linked with integrated pest control and species translocations programmes and open sanctuaries to ensure integrated ecosystem management and restoration. ARC was one of the first agencies in New Zealand to attempt large scale revegetation. The objectives and priorities for revegetation on regional parks include:

- Protection of eroded sites or for water quality;
- Good environmental practice including riparian planting;
- Conservation of habitats such as establishing or completing buffers, corridors or ecological sequences; and
- Restoring vegetation and ecosystems only found on parks.

53. The oldest revegetation plantings on regional parks are now over 15 - 30 years old, including plantings at Awhitu, Wenderholm, Long Bay and Tawharanui Regional Parks. The revegetation planting has created significant vegetated areas and habitats, however, many of these planted areas are only now starting to show development of a native understorey and ground layer including leaf litter and soil development, and growth of native tree and shrub seedlings and ferns. The ARC experience with revegetation planting shows that it can take a significant length of time (at least 10-20 years) for these ecological processes to begin. It can take longer (over 20-30 years) for native regeneration to be prolific and self sustaining.

54. Planting quick growing and hardy pioneer native species such as manuka and kanuka close together (at 1m to 1.5m spacings) is necessary to ensure a canopy cover is created within 5 years (ARC 2001), and to shade out grasses and weeds. Planting native shrub species such as karamu and mapou provides seed sources for native birds and helps to encourage regeneration of native species in the ground layer. Planting sites with kikuyu requires careful preparation, close planting and monitoring. The experience at Tawharanui Open Sanctuary shows that sheltered revegetation areas adjacent to existing native forest habitats are showing regeneration of native species and ecosystem processes within 10 years. Areas of a similar age that are located away from existing natural areas are still relatively bare in the understorey and ground layers, with sparse native regeneration. Linking revegetation plantings to existing natural areas provides the greatest ecological benefits and a self sustaining ecosystem within a shorter timeframe. The proximity to existing native forest ecosystems provides buffering of edges and allows native birds to spread seeds including future forest canopy species. The revegetation plantings at Tawharanui and other regional parks have been undertaken on retired farmland, where soils have a history of compaction and depletion. Natural ecosystem processes take time to develop in these soils. This would be typical of other areas within Rodney District.

55. Lessons on the benefits and successes of native revegetation planting are still being learnt. The revegetation plantings on regional parks will provide an ongoing source of information and best practice methods. The revegetation programme requires ongoing dedicated resources and management by rangers and heritage department staff. The success of revegetation plantings on regional parks also relies on ongoing and integrated plant and animal pest control, to control weeds and to control and eradicate predators of native fauna.

56. Experience with SEP at Arrigato is discussed in detail in the evidence of Ms Brenda Osborne. This shows that this was an ambitious large scale project on a coastal site, and that ecological benefits and ecosystem services have only partially been achieved. On the exposed coastal sites over ten years since original plantings were made, vegetation cover remains patchily distributed and below the 75% target. Kikuyu remains a significant threat to the success of the revegetation objectives. The exposed coastal sites will require substantial ongoing planting and maintenance before the vegetation becomes self-sustaining. Within the inland southern planted areas canopy closure has been achieved. However, exotic grass species are still dominant in the ground layer with native regeneration starting to occur. The area will be providing local habitat value for native birds.
57. Recent observations of the enhancement planting that occurred as part of the Di Andre subdivision on the slopes south of Omaha beach show that a native revegetation canopy cover has been achieved. This planting will be providing local ecosystem services such as erosion control, filtering of runoff and nutrients, and local habitat value. However, the planting has been undertaken in patches and provides limited ecological connections and wider ecological benefits. There are limited local seed sources to support natural regeneration and succession. Pest control will be required in the planted areas to provide habitat for a number of native fauna species. Without pest control habitat value will be very limited.

RECOMMENDATIONS

Methods to Avoid or Reduce Impacts on Ecological Values

58. Subdivision and development should be avoided in particularly sensitive areas. These include the Mangawhai and Te Arai coast and dunelands. These areas contain threatened species and threatened ecosystem types which have the potential to be significantly impacted by development. Subdivision and development should also be avoided or significantly limited in the catchments of, or in the vicinity of, regional parks where species restoration programmes are being undertaken, the Te Henga wetland, the Kaipara and Tomarata dune lakes, the Mahurangi and Whangateau harbours, and the Goat Island Marine Reserve. Enhancement planting is not adequate mitigation for the impacts of subdivision and development within or adjacent to significant ecological areas. Avoiding coastal development in sensitive areas is important due to the increased risk of spread of introduced weeds into natural areas, and the impact of human disturbance.

59. Methods to avoid or reduce impacts on ecological values should include:
- Avoiding subdivision and development within and close to significant natural areas and resources.
 - Avoiding subdivision and development around regional parks and open sanctuaries, habitats for threatened species, regionally significant coastal environments, marine reserves, and significant wetlands. Development should be located outside the catchment and/or with a significant buffer.
 - Locating houses and development well away from sensitive wildlife habitats. This needs to be assessed on a case by case basis and will depend on the fauna species present, the level of threat, and the potential impacts, including the potential intensity of human disturbance. As an example, on the Weiti land between Okura and Stillwater, subdivision is planned to be located 500 metres away from the coast at Karepiro Bay, and over 1200 metres away from the Weiti River shell spits, to protect shorebird values. Restrictions have also been placed on the keeping of domestic pets within the planned subdivision.
 - Avoidance of impacts on nationally threatened dune systems and wetlands, and habitats of threatened species.
 - Effective buffers and setbacks between development and significant natural areas.
 - Avoidance of fragmentation of native vegetation and habitats or loss of habitat.
 - Clustering and locating new subdivisions close to existing areas of development.
 - Comprehensive and integrated plant and animal pest control (targeting all pest species) and restoration plans developed by qualified ecologists and approved by council.
 - Covenanted and protection in perpetuity for natural areas and restoration areas.
 - Restrictions on cats and dogs for areas with sensitive wildlife values.
 - Management of human disturbance in sensitive wildlife areas.
60. For the East Coast Rural Zone I consider that there should not be significant subdivision and associated development in the vicinity of open sanctuaries and

regional parks and habitats for threatened species, and sensitive marine environments. Development should be limited to protect the sensitive values of the Whangateau and Mahurangi Harbours and their catchments, as is already provided within the proposed district plan through Subdivision for Significant Land Rehabilitation. If development is permitted, sufficient setbacks and buffers should be required, and there should be requirements for plant and animal pest control to protect threatened species.

61. For the Landscape Protection Rural Zone I consider that there should not be increased subdivision and development within and close to sensitive habitats for threatened species, and remote undisturbed coastal and duneland systems, and in the catchment of the Te Henga wetland. If development is permitted sufficient buffers and setbacks should be required and subdivision should be clustered around existing developed areas.
62. For the Dune Lakes Zone I consider that no significant increased subdivision and associated development should be allowed. If development is permitted, then management plans must be written and be implemented that include animal and plant pest control, fencing and riparian planting for water quality, rules on how on-water lake activities and surrounding land use activities will be managed to avoid disturbance to native fauna. Development should be located away from natural areas such as wetlands and riparian vegetation.
63. For Te Arai, I consider that subdivision or significant development should not occur. If development is allowed then subdivision should be clustered close to areas that have already been impacted by development. Development should not be allowed in the sand dune area. Any development in the vicinity of this area would need to include a ban on domestic pets, mammalian pest control, and management of human impacts on threatened species and the dunes.
64. For the Bush Policy Area of the Kawau Island Zone, enhancement planting is not appropriate at all as there is already an existing native cover on the island. Restoration planting would only be required in localised areas where pest plants are having an impact such as along coastal edges. Increased subdivision and development would lead to fragmentation of a relatively intact native cover, increased spread of pest plants and animals, and impacts on threatened species. Restoration planting brings considerable risk of introduction of exotic pests and pathogens in potted plants and associated media, e.g. Argentine ants, rainbow skinks, kauri dieback pathogen *Phytophthora taxon Agathis*, other *Phytophthora* species, weed seeds. Most of these pests are absent from Kawau and the sole

Argentine ant infestation is being eradicated by the ARC Biosecurity team. The kauri dieback-free status of Kawau and several other Gulf islands is likely to become strategically critical to the future of kauri, as many other new infestations are being discovered on the mainland and spread via animal vectors cannot in the main be prevented. There is a comprehensive plan for control and eradication of plant and animal pests on Kawau Island through the Auckland Regional Pest Management Strategy 2007-12. If further development is allowed this should be concentrated around existing settlements and include requirements for protection of wildlife values.

Methods to ensure enhancement planting provides for an ecological benefit

65. If enhancement planting is allowed in exchange for subdivision in the sensitive rural zones, it should be linked to a clear ecological benefit such as providing a significant buffer to an existing significant natural area, creating an ecological connection between significant natural areas, or creating a significant riparian buffer. This would ensure that the planted connection or buffer would be adding to and improving the existing ecological values of the site and the wider zone. The planted area would also be close to an existing natural seed source to facilitate natural regeneration and a self sustaining viable ecosystem. As I have described above any subdivision and development on a site should be located well away from sensitive ecological areas and significant natural areas to avoid significant impacts such as fragmentation, loss of habitat and species, disturbance of wildlife, increased weeds, and the impacts of domestic pets on fauna.
66. I support the concept of a valuable ecological benefit as defined in Chapter 3 in the proposed district plan. Enhancement planting, however, needs to demonstrate a link to a clear ecological outcome, and it needs to have a long-term maintenance and management programme. The success of a project is dependent on the ability of a landowner to undertake the project, and careful monitoring is also required by Council. Enhancement planting needs to be integrated with comprehensive restoration and plant and animal pest control plans, appropriate staging of enhancement planting, and consideration of existing site characteristics, requirements and natural regeneration patterns. An ecological assessment and restoration plan should be required and undertaken by a qualified ecologist.
67. With the experience gained from revegetation planting to date, I consider that maintenance should be required for more than 5 years. This should preferably be for at least 7-10 years and longer for difficult sites. At least 85% canopy closure should

be required to ensure the planting has more likelihood of being self sustaining. Weeds and exotic grass species such as kikuyu need to be shaded out by a close canopy of native pioneer species. Covenanted mechanisms for the planted area plus other natural areas on a site should require protection and management including plant and animal pest control in perpetuity. Revegetation planting needs to be staged to ensure it is manageable and achieves a benefit in the long-term. Linking to existing natural areas, and existing seed sources and fauna habitats will create a more sustainable ecosystem.

68. Integrated animal pest control (of all mammalian predators) is a key mechanism in protecting and managing native wildlife values. In many situations comprehensive plant and animal pest control, together with restoration planting and protection of existing natural areas will be what is required. Supporting natural regeneration is needed in areas where a cover of native vegetation already exists, such as existing shrublands and dunelands, and this is achieved by plant and animal pest control.
69. Larger areas of plantings have the potential to create larger areas of habitat and provide more significant ecosystem services. For example, a 10ha area of native forest is more sustainable than 6ha area of forest, as it has more ability to show interior forest ecosystem conditions. Smaller remnants have increased edge effects and increased threats from high light conditions, lower humidity and increased weed invasion. Consideration should be given to increasing the requirement for the minimum size of enhancement planting areas so that an area of enhancement planting is more sustainable in the long-term. I note that the protection and covenanting of an existing native forest remnant has more immediate ecological benefits than the planting of 6ha of native plants which takes at least 10 to 20 years with careful management to show long-term successional processes.

CONCLUSIONS

70. Within the East Coast Rural, Landscape Protection, Dune Lakes and Kawau Island (Bush Policy Area) Zones are habitats and ecosystems with significant ecological areas and wildlife values that would be significantly impacted by the effects of subdivision and development. These sensitive rural zones contain a significant diversity of regionally and nationally important ecological values including habitats for nationally threatened species. Areas of particular ecological sensitivity include the Mangawhai and Te Arai coast and dunelands, the Kaipara and Tomarata dune lakes, the buffer areas to regional parks, the catchments of the Whangateau and Mahurangi Harbours, the Goat Island marine reserve, Kawau Island, the Te Henga

wetland and the Muriwai coast. In my opinion, subdivision and development should be avoided in the catchments of, or in the vicinity of, sensitive wildlife habitats and significant natural areas.

71. The benefits of enhancement planting need to be weighed up against the impacts of subdivision and development on ecosystems and species. In my opinion, enhancement planting does not provide adequate mitigation for the potential effects of development in the sensitive rural zones. If an enhancement planting approach is taken it needs to be combined with an integrated approach for a whole site which includes long-term maintenance, management and protection, and plant and animal pest control. Subdivision needs to be located well away from significant natural areas and sensitive wildlife values. A clear ecological benefit must be demonstrated that includes creating a significant ecological connection, buffer or riparian buffer which adds to or improves the existing ecological values of the specific site and wider zone, and will ensure the planted area is more viable and self sustaining. The ecological benefits of enhancement planting need to provide significantly more than just plants in the ground.

Shona Myers

7 May 2010

REFERENCES

Auckland Regional Council 2001 Riparian Zone Management Strategy, Guideline, and Planting Guide for the Auckland Region. Technical Publication 148.

Costanza R, R d'Arge, R de Groot, S Farberk, M Grasso, B Hannon, K Limburg, S Naeem, R V. O'Neill, J Paruelo, R G. Raskin, P Sutton, and M van den Belt. 1997 The value of the world's ecosystem services and natural capital. *Nature*, Vol 387.

de Lange, P.D., Norton, D., Heenan, P. B., Courtney, S.P., Molloy, B.P.J., Ogle, C.C., Rance, B. D., Johnson, P. N. Hitchmough, R. 2004. Threatened and uncommon plants of New Zealand *Journal of Botany* 42: 45–76

Dowding, J.E. and Davis, A.M. 2007. New Zealand dotterel (*Charadrius obscurus*) recovery plan, 2004-2014. Department of Conservation, Wellington.

Dowding, J.E. 2006. Potential impacts on shorebirds of a proposed subdivision at Te Arai, North Auckland.

Evans B 1983 Revegetation Manual: Using New Zealand Native Plants. Produced for the Queen Elizabeth II National Trust.

Hansen, K. 2006. New Zealand fairy tern (*Sterna nereis davisae*) recovery plan, 2005-2015. Department of Conservation, Wellington.

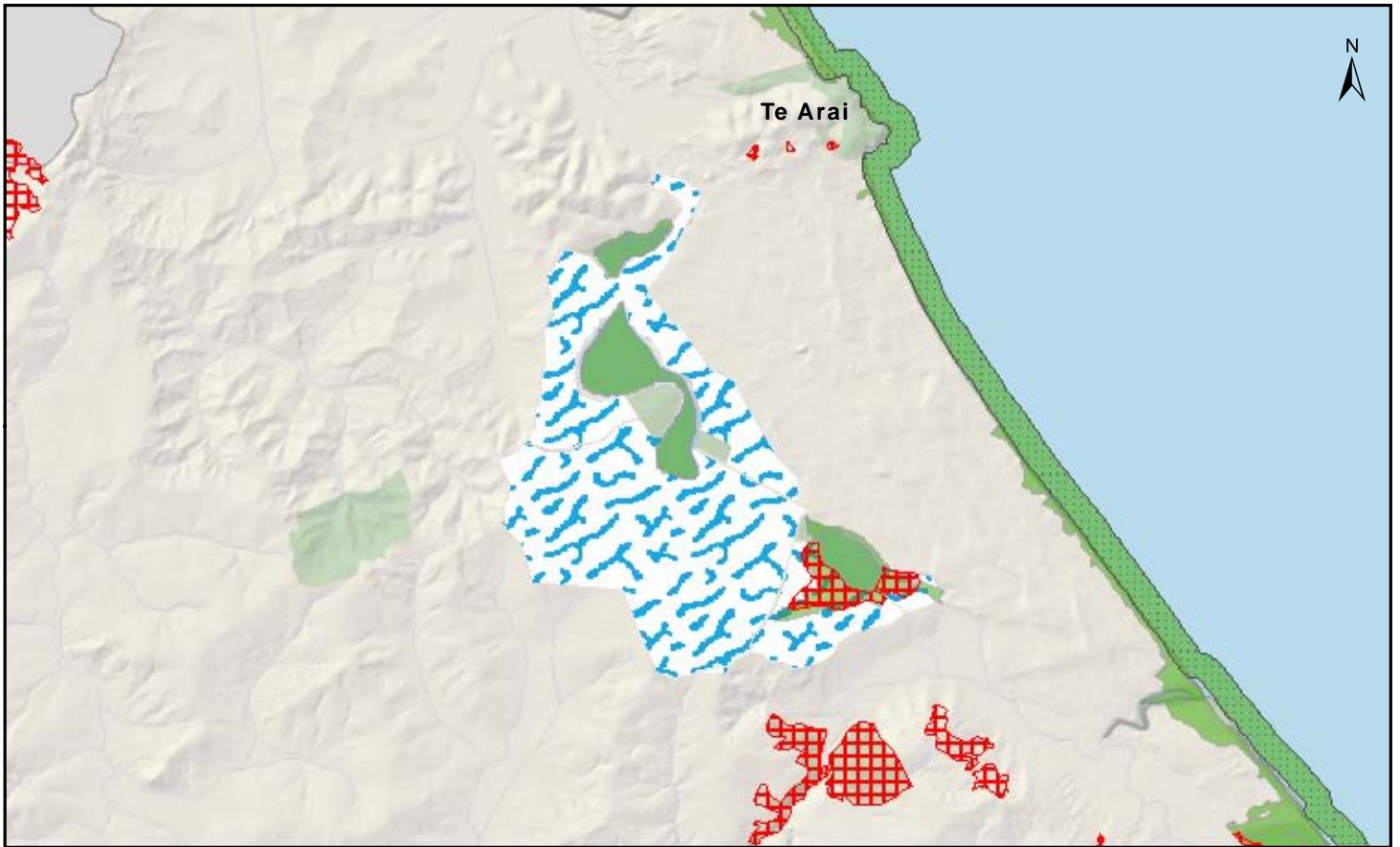
Hilton, M., Macauley, U., Henderson, R. 2000. Inventory of New Zealand's active dunelands *Science for Conservation* 157, Department of Conservation, Wellington.

Lee W, Williams P, Cameron E 2000. Plant invasions in urban environments – the key to limiting new weeds in New Zealand. In Suckling, D.M.; Stevens, P.S. (Eds.) *Managing Urban Weeds and Pests. Proceedings of a New Zealand Plant Protection Society Symposium, The Centra Hotel – Auckland Airport, August 9th, 1999.* Pp 43–58

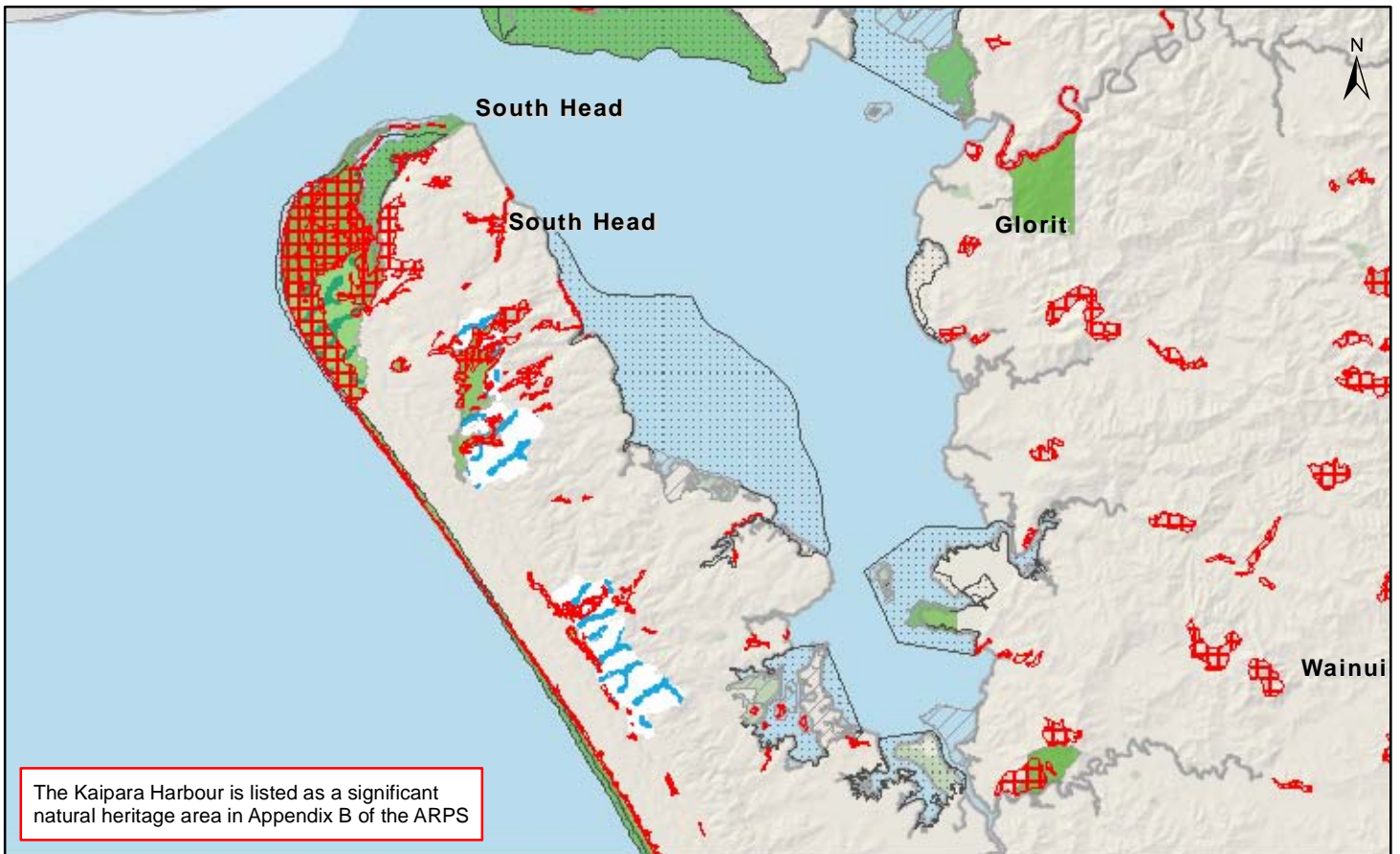
Ministry for the Environment and Department of Conservation 2007 *Introducing the National Priorities for Protecting Rare and Threatened Native Biodiversity on Private Land.* Ministry for the Environment, Wellington

Stanley B 2009 *Draft Parks Revegetation Guideline.* Auckland Regional Council

Sullivan, J.J., Timmins, S.M., Williams, P.A. 2005. Movement of exotic plants into coastal native forests from gardens in northern New Zealand. *New Zealand Journal of Ecology* 29(1): 1-10.









0 250 500 1,000 1,500 2,000 2,500 Meters



The Kaipara Harbour is listed as a significant natural heritage area in Appendix B of the ARPS

0 1 2 4 6 8 10 Kilometers

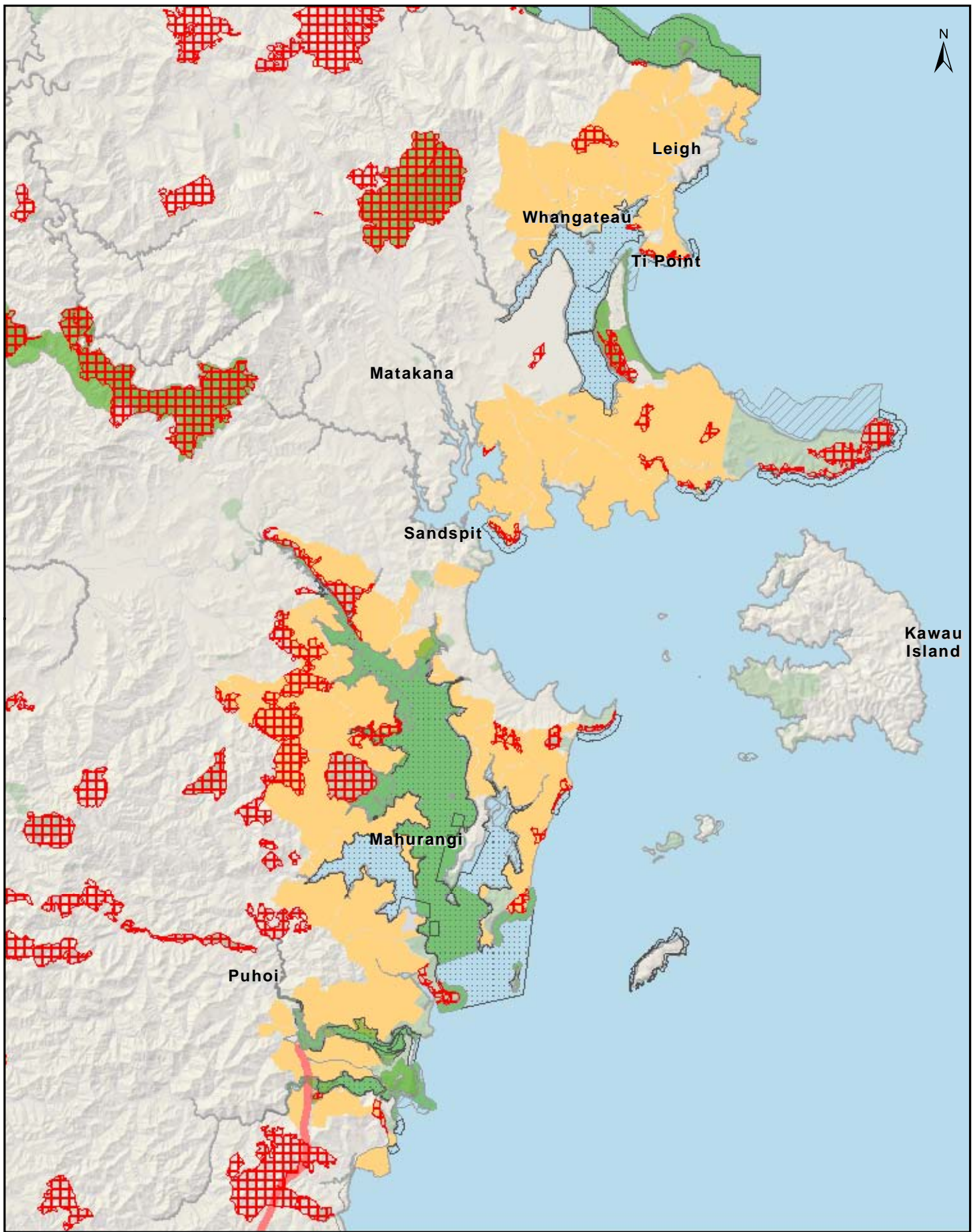
Legend







-  Dune Lakes
-  Rodney District Plan Significant Natural Areas
-  Auckland Regional Policy Statement Appendix B
-  CPA 1
-  CPA 2
-  Public Open Space

Rodney District Council
Dune Lakes

Map Produced by GIS
Information Services
Auckland Regional Council



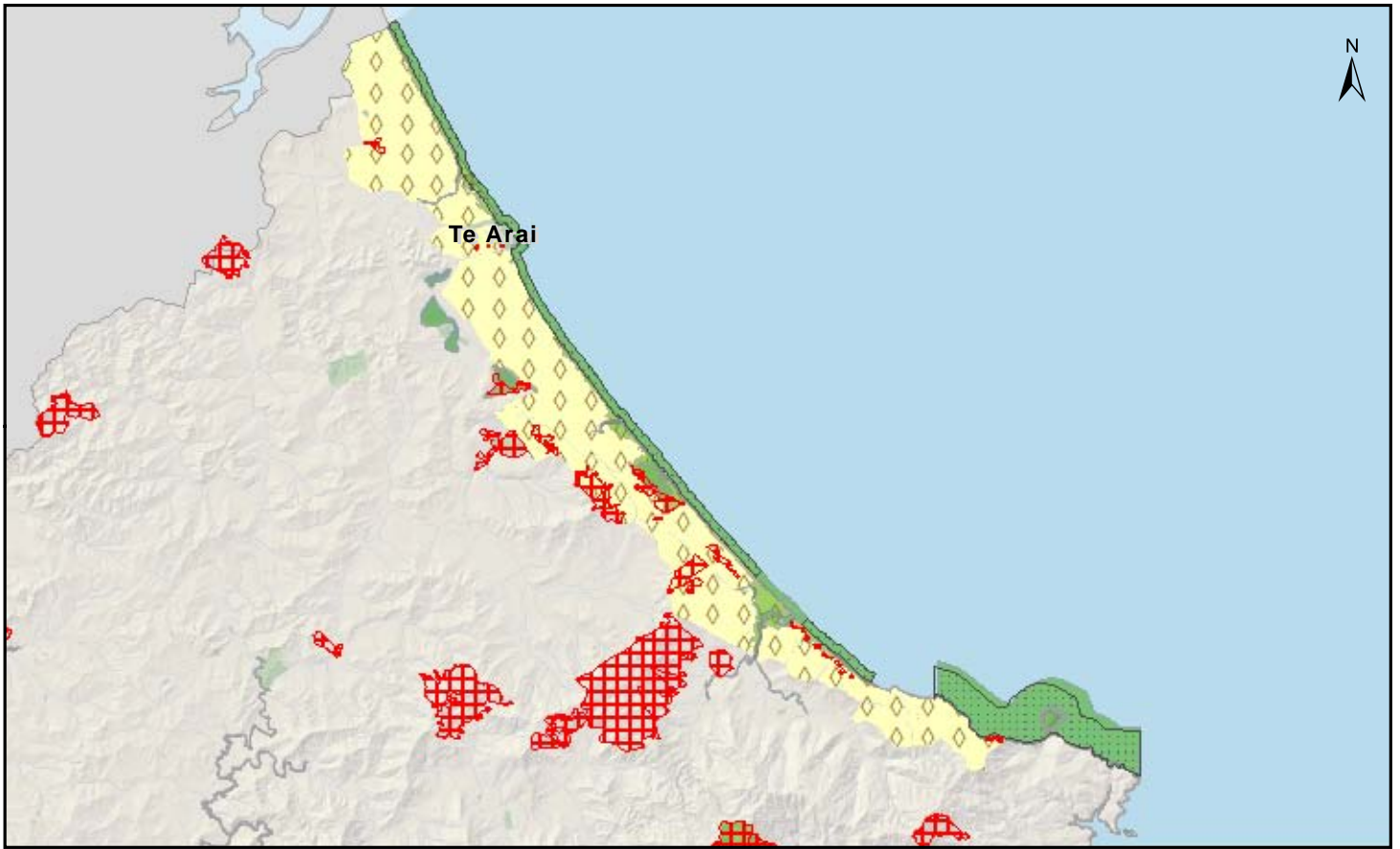


Legend	
	East Coast Rural
	Rodney District Plan Significant Natural Areas
	Auckland Regional Policy Statement Appendix B
	CPA 1
	CPA 2
	Public Open Space

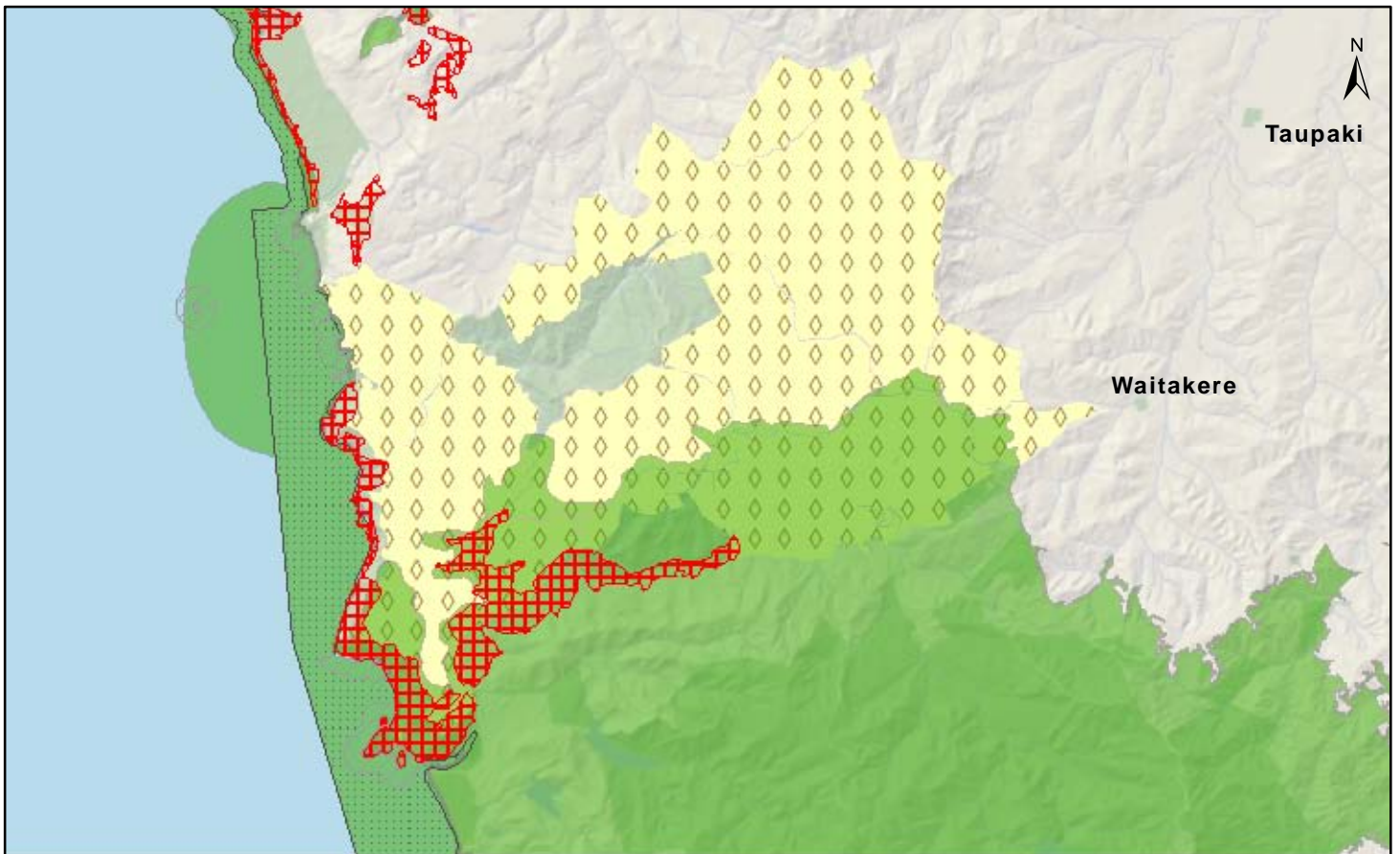
Rodney District Council East Coast Rural

Map Produced by GIS
Information Services
Auckland Regional Council











0 1 2 4 6 8 10 Kilometers



0 0.5 1 2 3 4 5 Kilometers

Legend

- | | |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
|  Landscape Protection Rural |  CPA 1 |
|  Rodney District Plan Significant Natural Areas |  CPA 2 |
|  Auckland Regional Policy Statement Appendix B |  Public Open Space |

Rodney District Council
Landscape Protection Rural

Map Produced by GIS
Information Services
Auckland Regional Council

