

## MANAGEMENT PLAN FOR PROTECTION OF SHOREBIRDS AND OTHER BIOTA AT TE ARAI

### 1 OBJECTIVES

- To maintain effective control of top predators (dogs, cats, mustelids) throughout the year.
- To maintain effective control of mammalian predators at Te Arai Stream during the shorebird breeding season, August-January.
- To maintain effective control of mammalian predators in a managed buffer to Mangawhai Sandspit during the shorebird breeding season.
- To maintain effective protection of duneland biota.
- To minimise human impacts in sensitive sites.
- To increase awareness of biota of the Te Arai area.
- To monitor success of the ecological programme.

### 2. MANAGEMENT METHODS

#### 2.1 Control top predators throughout Te Arai

##### Target Species

- Dogs, cats, and mustelids (ferrets, stoats, weasels).

##### Timing

- Continuous.

##### Method

- Dog exclusion covenant in place throughout all of the Te Arai development.
- Dog exclusion advocacy, with a system for providing reports (of dogs) to duty warden(s).
- Dogs excluded from beaches at Te Arai by Council bylaw (integrate with Rodney District Council).
- Appoint pest control operator to undertake predator control for two days/week in July-February and two days/month for remainder of the year.
- Establish cat-free covenant for all of the Te Arai development.

- Cat traps, set continuously at key points, especially secluded stream banks, re-invasion boundary points to south and west, and the northern perimeter. Traps required are a combination of modified Conibears (SA traps, c.20), modified Timms traps (c.20), and cage traps and box traps (c.20), all baited mainly with fresh rabbit or fresh fish. Kill traps (SA and Timms) to be checked fortnightly in winter, weekly in summer (October-March). Include new technology (trap types and baits) as appropriate.
- Mustelid traps, set continuously. Traps required are double set Fenn Mark 6 traps placed under white plastic tunnels. Avoid tunnels with floors, which reduce rat capture rates, or black plastic tunnels, which result in “cooked” baits in sunny locations. Baits should be mainly salted rabbit (follow standard prescription. i.e. 2.5 cm cubes of hairless rabbit meat soaked overnight in non-iodised salt mix. drain blood, ensure baits are firm, keep frozen until day of use). Place bait on elevated wire between the two traps. Haze traps to direct animal over the trap plate. Check monthly in cooler months and fortnightly in warmer months (October-March). Fresh rabbit is a useful alternative to salted rabbit, and checking should be undertaken twice weekly if used. Investigate other efficient kill-traps that become available, e.g. there are indications that the DOC 200/250 trap design is effective.
- Possums – contract control is needed when indices exceed 10% residual trap catch (RTC) or equivalent bait take level.

### Monitoring

- Record sightings of dogs and outcomes of incidents.
- Cat and mustelid captures entered on database and monitored throughout year.
- Check for predator footprints on beach and at estuary.
- Rabbit browse on pingao.
- Possum indices.

### Contingency Plans

- Increased dog control – several options are available and advice should be sought from the New Zealand Landcare Trust and Department of Conservation.
- If trap-shy cats and mustelids are present, liaise with other predator controllers (e.g. DOC kiwi programme) – options include the use of predator dogs or alternative trapping and baiting methods.
- Rabbits – if rabbits become common and are affecting sensitive plants (e.g. pingao), implement control using Pindone poisoning or night-shooting.
- Rats – if rats increase in numbers, consider widespread control – refer to Section 2.2 below.

## 2.2 Te Arai Stream

### Target Species

- Norway rat, ship rat, hedgehog, dogs, cats, mustelids, and possums.

### Timing

- 1 August – c.30 January, later if unfledged chicks are present.

### Methods

- Rats are best controlled by poisoning with bait stations placed on a c.100 m grid from c.200 m north of Te Arai Stream and extending to c.600 m south of the stream. The grid should be 2 lines wide behind the dunes and additional stations should extend along both banks upstream for c.500 m (refer to map). Initiate control in late July-early August using diphacinone (Ditrac) placed in plastic tubing (500 mm long x 70 mm wide) with multiple baits pegged in place by wire pegs that pass through baits and the station and into the ground. There are also submarine-shaped bait stations designed especially for these baits and which are more weather proof. All bait stations need to be ground-based because of the terrestrial behaviour of Norway rats.
- Rat numbers are best monitored initially by the rate of bait-take from the bait stations. Once bait take has ceased, this should be verified using other methods, e.g. tracking tunnels in the rear-dune area (n=25 on the inside of the dotterel nesting areas), rat capture rates in Fenn traps and checking for rat footprints along the muddy edges of the Te Arai Stream prior to shorebird breeding. If rat sign persists, provide more poison in the bait stations. If there is no additional bait take, consider setting standard rat traps at 50 m intervals along the Te Arai Stream, and trialling alternative baits and lures.
- Mustelids – as per wider Te Arai programme (refer to Section 2.1 above), with the addition of Fenn traps at 100 m intervals along the stream edge upstream of the dunes and at 100 m intervals along the rear of the dunes running south from the Te Arai Stream for the duration of the nesting area (c.600 m). Repeat on northern side for c.200 m. Baits and checking regime as per Section 2.1 above.
- Cats – as per wider Te Arai programme, with the addition of c.10 kill traps (modified Timms and modified Conibear) located at c.200 m intervals behind the colony, including stream banks - baited with fresh rabbit pieces and minced rabbit respectively, and checked and rebaited weekly.
- Hedgehogs –as per mustelids above.
- Possums – control needed only if RTC exceeds 10% (refer to Section 2.1 above). Site-specific control options could include Timms traps baited with apple/cinnamon and modified Conibear traps (SA traps) lured with flour/cinnamon.

- Rabbit contingency – as per Section 2.1 above.
- Gulls – discuss control methods with the Department of Conservation if there are concerns regarding black-backed gull impacts on shorebirds. Effective gull control has been undertaken at other sites using the narcotic Alphachloralose.

#### Monitoring and Contingencies

- As per Section 2.1 above.

### 2.3 Buffer to Mangawhai Wildlife Refuge

#### Target Species

- Norway rat, ship rat, hedgehog, dogs, cats, mustelids, and possums.

#### Timing

- 1 August – 30 January, or later if unfledged chicks are present.

#### Method

- Rats – use bait stations as per Te Arai Stream, i.e. placed at 100 m intervals along two parallel lines also 100 m apart. Note that another double line buffer should ideally be established by the Department of Conservation between the Tern Point subdivision and Mangawhai Sandspit.
- Mustelids – as for the Te Arai Stream regime, i.e. double lines of Fenn traps located at c.100 m intervals along likely hunting pathways. Baiting regime as per Te Arai Stream.
- Cats – as per wider Te Arai programme, with the addition of c.20 kill traps (modified Timms and/or modified Conibear) along the boundary - baited with fresh rabbit and minced rabbit respectively and checked and rebaited twice weekly.
- Hedgehogs – as per mustelids above.
- Possums – as per Te Arai Stream.
- Rabbit contingency – as per Section 2.1 above.

#### Monitoring and Contingencies

- As per Section 2.1 above.

## 2.4 Protection of dune biota

### Target Species

- Norway rat, ship rat, hedgehog, dogs, cats, mustelids, possums, and rabbits.

### Timing

- Continuous.

### Methods

- Determine target area, i.e. example of best representative habitat, which is likely to include the back dunes extending c.600 m south of Te Arai Stream. Undertake invertebrate survey.
- Rats – use same bait stations as per Te Arai Stream, but maintain control year round. Monitor bait take and remove baits if none are being eaten; monitor rodents, including mice.
- Mustelids – as for the Te Arai Stream regime.
- Cats – as per Te Arai Stream regime.
- Hedgehogs – as per mustelids above.
- Possums – as per Te Arai Stream.
- Rabbits – monitor sensitive plants, e.g. pingao, for signs of rabbit browse and implement control as per Section 2.1 above.

### Monitoring and Contingencies

- As per Section 2.1 above.

## 2.5 Minimise human impacts on biota

### Target Species

- People.

### Timing

- Spring and summer for shorebird protection, ongoing for sensitive habitats.

### Methods

- Appoint and train, with Department of Conservation support, four part-time wardens to undertake compliance and law enforcement and advocacy. The aim is

to provide protection (from people) for the fairy tern nests and chicks at Mangawhai Spit, and shorebirds generally at Te Arai.

- The principal aim of this monitoring is to ensure disturbance from people is kept to an absolute minimum during nesting. Likely nest sites will be identified from bird behaviour and these areas will then be roped off and signs erected to ensure that people do not enter.
- It is anticipated that one warden will be stationed at Te Arai throughout the nesting period and that others will be based at Mangawhai as required, i.e. when pairs of fairy terns are nesting. It could be that two pairs can be safely observed by one warden, but it is likely that up to three wardens will occasionally be needed to check simultaneously.
- Roles will also include some general behavioural monitoring of terns, e.g. responses to predators.
- Develop a culture of care among residents and encourage residents to take part in the structured management and monitoring programmes.

#### Monitoring and contingencies

- Assess and review annually.

## 2.6 Advocacy

#### Target Species

- People.

#### Timing

- Throughout year but especially in spring and summer for shorebird protection.

#### Methods

- Appoint wardens (refer to Section 2.5 above).
- Erect interpretation panels at Te Arai Stream and along the northern boundary to highlight habitat and species values, threats, codes of conduct, how people can be involved, and any other relevant matters. News updates could also be provided.
- Construct a warden headquarters beside the Te Arai Stream.

#### Monitoring and Contingencies

- Review annually.

## 2.7 Outcome monitoring

### Target biota for Monitoring

- Dunes, vegetation, fairy tern, New Zealand dotterel, other sensitive fauna. For threatened fauna, performance targets should be agreed with the Department of Conservation and include, for example, an assessment whether annual nest failures due to predation and disturbance is significantly different to that recorded in previous years of management.

### Timing

- Throughout the year, but especially spring and summer for shorebird protection.

### Methods

- Wardens trained in collection and recording of shorebird data, as agreed with the Department of Conservation.
- Confirm monitoring responsibilities with the Department of Conservation and collect appropriate data.
- Set up vegetation photo points in key sites being managed (e.g. dunelands and wetlands at Te Arai) and consider monitoring other biota, e.g. dune invertebrates, whitebait.
- The following fairy tern data should be collected each season at Mangawhai, in collaboration with Department of Conservation: total numbers of pairs, and for each pair, colour bands, number of nests initiated (don't visit nests, determine from observations), number of nests hatched, number of chicks hatched, number of chicks fledged, and causes of failure (where known).
- The following New Zealand dotterel data should be collected each breeding season at Te Arai, in collaboration with Department of Conservation: total number of pairs, and for each pair, colour bands, number of nests initiated (don't visit nests), number of nests hatched, number of chicks hatched, number of chicks fledged, and causes of failure (where known).
- Record details of any terns seen at Te Arai – date, species, number, behaviour, observer.
- Analyse and report on outcome monitoring annually.