Guidance in Relation to New Zealand Dotterels on NZTA Land

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QUICK REFERENCE FOR PROJECT MANAGERS

New Zealand Dotterels are protected by law.

If they are on your site there are ways that work can still progress and dotterels are not adversely affected. This document will explain how.

Some key questions and where to find the answers are given below.

WHAT ARE THE CHANCES OF DOTTERELS BEING ON MY SITE?

Is your site reasonably flat and with little or no vegetation?

YES!

Dotterels may like your site and move in.

WHAT YOU CAN DO

Detect dotterels early and seek advice. You can reduce risk of delays and also be helping dotterels out by thinking ahead.

THIS DOCUMENT WILL ENABLE YOU TO PLAN AHEAD AND AVOID DELAYS.

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Appendices

Appendix A: Dotterel information for site staff

Appendix B: Other birds seen on NZTA land

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Appendix D: Known dotterel breeding sites

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Glossary

Adult	An adult dotterel is a dotterel that has reached breeding age.
Breeding Pair	A male and female dotterel that have paired up to have chicks.
Breeding Territory	An area that a dotterel will defend where its nest, eggs or chicks are.
Juvenile	A dotterel that is showing some adult features but is not sexually mature.
DOC	Department of Conservation
Fledge	Develop wing feathers that are large enough for flight.
Fledgling	A young dotterel that has recently acquired its flight feathers.
Scrape	A dotterel nest. It is a slight depression in the ground formed by the male dotterel.
Prospecting	A breeding pair searching for a suitable place to set up a breeding territory.
Plumage	The feathers covering a bird.
NZTA	New Zealand Transport Agency

1 Introduction

The northern New Zealand dotterel (*Charadrius obscurus*) is an endemic species of shorebird. It is classified as threatened, with the main threats to its survival being predation and increasing impacts from human–based disturbance, habitat loss and degradation caused by development.

This document provides information about the northern New Zealand dotterel (henceforth referred to as 'dotterel') to assist in the management of NZTA land that dotterels utilise. It is tailored to be used by project managers, site supervisors and environmental advisors. Informtion for site staff are included in the appendices. Although this document focuses on road construction and highway maintenance and operation projects it can also provide guidance for other types of development projects.

1.1 Purpose of document

The purpose of this document is to provide NZTA with guidance on how to manage NZTA land that is or may be utilised by the northern New Zealand dotterel (*Charadrius obscurus*). Guidance is provided on how to manage activities so as to avoid and mitigate any potential negative effects on dotterels.

1.2 NZTA's commitment to environmental management

NZTA is committed to environmental management and protecting and enhancing the environment where appropriate. Table 1 presents the goals and objectives of key national documents relevant to biodiversity and dotterels.

Table 1: Goals and objectives of National Documents Relevant to Biodiversity

National Documents	Relevant Goals, Objectives and Expectations
New Zealand Transport Strategy	Objective: Ensure environmental sustainability.
New Zealand State Highway Network Strategy	Goal: Improve the contribution of state highways to the environmental and social wellbeing of New Zealand.
NZTA Environmental Policy	Aim: Protect and enhance the environment where appropriate.
NZTA Environmental Plan	Objective: Promote biodiversity on the state highway network.
Guidelines for Highway Landscaping	Expectation: Promote Biodiversity.

2 Background

2.1 Key issues

- Dotterels are conservation-dependent i.e. the population will decline without management.
- Increasing development and recreational use of the coast are imposing further pressure.
- Because of increased development and reduced natural beach habitat dotterels are breeding and raising chicks in less traditional areas such as earthworks sites, stockpiles, and maintained grassed areas such as parks. This increases the likelihood of people impacting upon them and also the magnitude of the impact.
- Dotterels set up breeding sites before the earthworks season starts. This means when works begin dotterels have often already established breeding territories.
- Unless addressed at the beginning of a project, dotterel mitigation is not necessarily available for all situations leading to delays and costs to roading projects.
- Dotterel nests are well camouflaged and very difficult to see. Their chicks are also difficult to see when they are hiding making both eggs and chicks prone to loss.
- Dotterels are widely spread, with the majority of sites having a small number of breeding pairs. Every bird counts however management of a few birds at a lot of sites is logistically difficult for Department of Conservation (DOC). Buy in from developers impacting upon resident dotterels is necessary to ensure continuation of the dotterels current range.

No Management = No Dotterels

2.2 Protection status and threat classification

New Zealand dotterels are afforded protection through two key sets of legislation:

- Wildlife Act Section 53 (1953)
- Resource Management Act

The number of New Zealand birds that are classified in New Zealand's National Threat Category as extinct, threatened, at risk and not threatened are shown in Figure 1. Northern New Zealand dotterels are classified as threatened 'Nationally Vulnerable'. This is the same as the North Island Brown Kiwi (*Apteryx mantelli*).

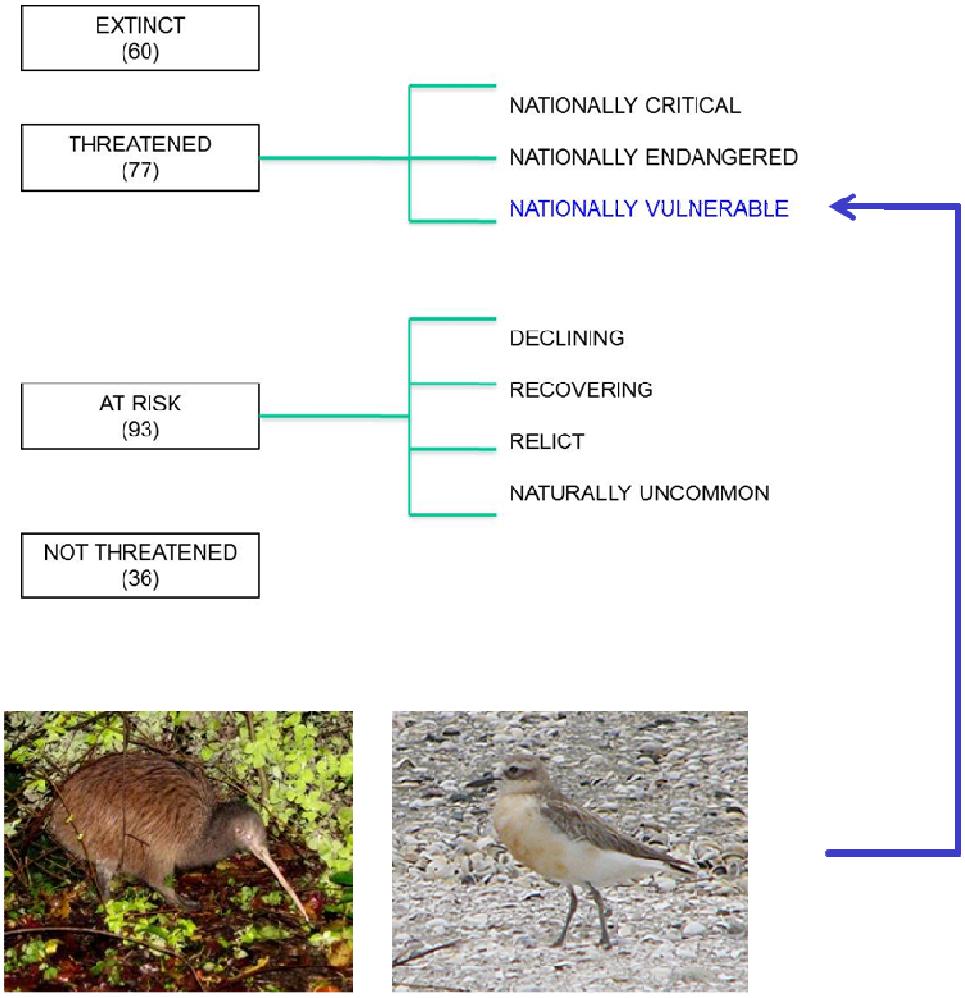

Figure 1: North Island Brown Kiwi and Northern NZ dotterel are in the same National Threat Category (adapted from Dowding, 2008)

2.3 Threats to dotterels

Threat	Explanation
Development  	Extensive development of dune and coastal areas in northern New Zealand has resulted in dotterel habitat loss and degradation. This is forcing them to breed in non-traditional environments including areas intensively managed by people.
Predatation  C. Bannock	Dotterels are at risk from predation at all stages of their lifecycle (egg, chick, adult). Predators include: • stoats • cats • rats • hedgehogs • possums • pukeko • seagulls • harrier hawk
Natural Events  C. Bannock	Eggs and chicks are particularly susceptible to natural events such as high winds and big tides. Dotterels that nest in habitats close to the sea and rivers are susceptible to nests being washed out at spring high tides. There is also a risk of eggs and chicks overheating or getting too cold if they are not suitably protected. In some areas coastal erosion is depleting suitable dotterels sites such as the site in the photo, Sulphur Beach, Auckland.
Human Disturbance  C. Bannock	People, their vehicles. dogs and stock can impact directly and indirectly on dotterels by: • Trampling or crushing eggs and chicks. • Parent disturbed off nest and egg gets too hot or too cold. • Birds putting themselves at risk when disturbed by people e.g. running onto a live lane of a motorway. • Running over eggs or chicks when grass mowing. • Energy loss from the parents trying to defend the nest.
Competition	Spur-winged plovers like similar breeding sites as dotterels in the urban (non-traditional) environment. They are aggressive and may deter dotterels from setting up a breeding territory in an area. This limits suitable breeding territories. Spur-winged plovers also can harm dotterels, their eggs and chicks.

3 General Characteristics

3.1 Appearance

3.1.1 Adult dotterel

The northern New Zealand dotterel is a rather squat bird with a large head, large dark eyes and heavy-looking black bill. They have proportionality short legs that are olive-grey in colour. Plumage changes, depending on whether the bird is breeding or not. Figure 2 and Figure 3 below show plumage of a non-breeding dotterel and breeding dotterel.

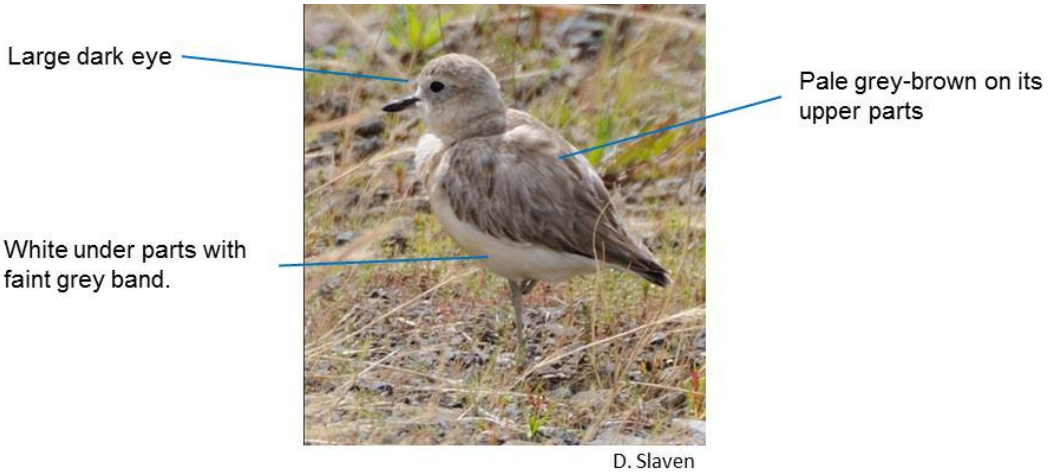

Figure 2: An adult dotterel in non-breeding plumage

Dotterels tend to be in non-breeding plumage from late February till about July. From July individuals that will be breeding start 'colouring up'. Breeding plumage can vary in colour depending on the individual bird and the time of its breeding period. Generally the colour is lighter at the beginning of their breeding season and when they have finished breeding. The breast colour can vary from being light apricot to dark orange.

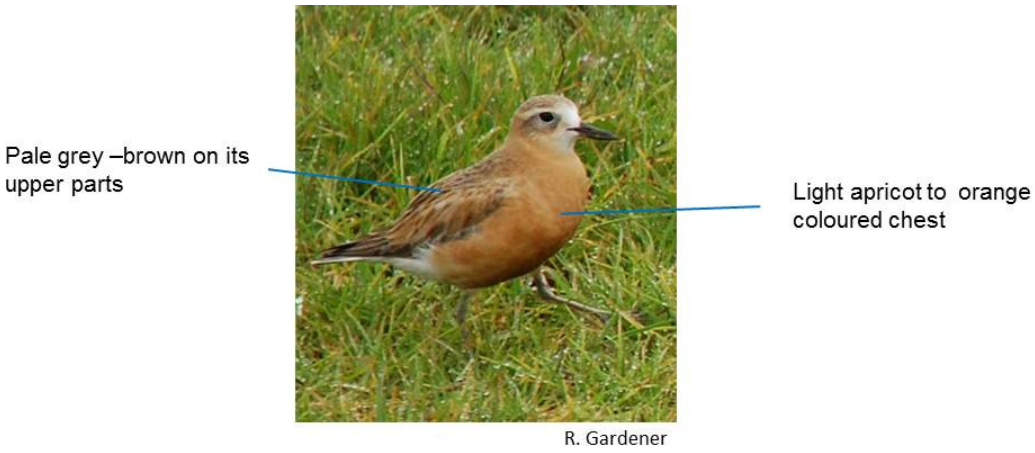

Figure 3: An adult dotterel in breeding plumage

3.1.2 Juvenile dotterels

Dotterel chicks start developing feathers and look very similar to adult dotterels. There are some key characteristics that can help distinguish between a juvenile dotterel and an adult:

- Short tail – the tail feathers of the dotterel are the last to develop.
- Ruff of down around the neck – juvenile dotterel have a ruff for a few weeks after fledging.
- Exposed tibia – the adult dotterels chest is much fatter and covers the upper tibia. With juveniles you can still see the upper tibia making them look leggier than adults.
- Yellowish tinge to the legs - Juveniles legs have a yellowish tinge whereas adults legs are olive-grey in colour.
- Weight – juveniles weigh less than adults and look slimmer. They weigh 90 – 110 g whereas adults weigh about 140g.
- Juveniles look slimmer and leggier than adult dotterels. Do not go by the colour of the breast plumage.

3.1.3 Dotterel chicks

Dotterel chicks are small, and camouflaged. Figure 4 shows two newly hatched chicks. Chicks are very mobile once hatched. If they are present generally both parents will be around and making agitated calls. See section 3.3.2 for details on defensive behaviour displayed by dotterels with a nest or chicks.

D. Slaven

Figure 4: Dotterel chicks lying camouflaged on the ground.

3.1.4 Dotterel nests (scrapes)

- Dotterels lay their eggs in a nest which is known as a scrape.
- If dotterels are nesting in soft substrate such as sand, shell or pebbles a scrape is a slight indentation in the ground and approximately 12 cm in diameter.
- If dotterels are nesting on grass the scrape will be a slightly flattened area. Scrapes in grass are generally hard to see and the grass can grow up around the nest making it even more difficult to spot them.
- Dotterels often have objects around their scrape which they use to find it (markers). A marker can be dried seaweed, driftwood or an empty bottle. It is important not to move objects around their scrape because of this.

Figure 5: Dotterel scrape in shell.

3.1.5 Dotterel eggs

- Dotterel eggs are pale olive to buff-brown in colour and heavily marked. They are 46 x 31mm in size. Usually there are two to three in a nest.
- They are very hard to see on the ground.
- There are a number of bird species that have similar looking eggs. See Appendix A.

Figure 6: Dotterel eggs on sand and grass

3.2 Habitat

Adult dotterels generally alternate between two areas each year, their breeding territory and the post breeding flock site. This is where most birds gather outside of breeding season.

Dotterels breed on sand spits, at stream mouths, on beaches, shell banks, and sandbanks. Increasingly they are breeding in modified habitats including construction sites, airport ferry way and maintained park areas. They prefer open, flat areas with little or no vegetation where they can easily see any potential predator.

Post breeding flocks form in similar areas of open, flat terrain. For example, an undeveloped grassed area on the North Shore is known to be occupied by approximately 35 dotterels outside of breeding season.

Figure 7: A non-traditional dotterel breeding site within a motorway interchange

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Figure 8: A post-breeding flock at Warehouse Way, North Shore

3.3 Behaviour

3.3.1 Breeding behaviour

New Zealand Dotterels start breeding when they are around 2 years old. A male and female pair up and tend to stay together for life. Divorces are rare but do happen. If a divorce happens or one of the birds in the pair dies the other bird may pair up with a new mate, usually at the post-breeding flock.

Breeding pairs establish their breeding territories around the end of July each year. They defend this against other NZ dotterels. More than one pair can be in close proximity but they will have individual territories. The core period for breeding is September to January but it can be earlier or later than this depending on the individual.

Three eggs are usually laid over 2 – 4 days. This means that if a nest has one or two eggs in it that another egg is likely to be laid soon. The eggs are incubated for 28 - 32 days by both parents before they hatch. The female tends to sit on the nest during the day and the male dotterel sits on the nest at night.

Chicks are guarded by their parents till they fledge. The chicks fledge (are able to fly) at around 6 to 7 weeks of age. They are most vulnerable for the first 2 weeks after hatching. If they make it to their 3rd week there is a good chance they will fledge.

Once fledged the chicks disperse, and can wander widely for 9 – 18 months before settling in an area. They join a post breeding flock and this is where they will pair up with their mate. Flocks can form from December / January onwards and break up around July when birds disperse to breeding territories.

3.3.2 Defensive behaviour

In the breeding season dotterels with breeding territories will show defensive behaviour to anything that they think is a threat. This includes people. Defensive behaviour includes calls, running in front of potential threats to distract and lure them away ('rat run'), and pretending to be injured ('broken wing'). How they are behaving and how vigorously they do it can indicate a number of things useful to know for management purposes including:

- If dotterels have set up a breeding territory in the area
- Location of the nest (scrape), eggs and chicks
- How close the eggs are to hatching (if the nest site is known)
- Whether chicks have hatched and are alive
- Where chicks are hiding

The types of behaviour you would expect to observe when coming close to a breeding pair of dotterels are described in Table 2. Generally, the closer you are to their nest, eggs or chicks the more strongly the breeding pair will display. Figure 9 shows how the intensity of the displaying tends to change depending on proximity to eggs or chicks, and the types of behaviour you would expect.

Individual birds do differ in how enthusiastically they display. For example, some birds have been observed showing no reactions at all whereas others are known to throw themselves at the feet of people in order to stop them from moving closer to their nest. This needs to be taken into consideration. Frequently monitoring the birds allows you to become familiar with an individual's particular traits and be more accurate in analysing the behaviour observed.

Be aware that birds may be elsewhere (e.g. out feeding) so may take a few minutes to realise that you are there. Even if birds are not there be sure to watch every step in known dotterel breeding sites in case there is a nest or chicks present. Monitoring etiquette at dotterel sites is described in detail in Section 4.

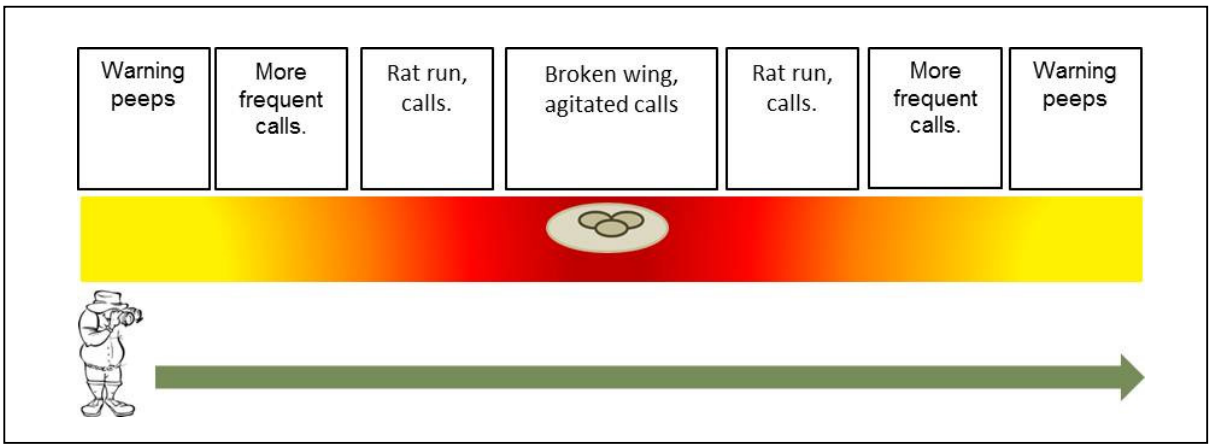


Figure 9: Intensity of display in relation to observer proximity to a nest or chicks

Table 2: Reading dotterel behaviour

Image	Behaviour	What it Means
	One or two dotterels present at a site from July.	A dotterel pair is possibly setting up a breeding territory. They intend to nest and raise chicks.
	A dotterel takes interest in you when you walk into an area and peeping from time to time. Calls are often accompanied by head-bobbing.	Warning peeps that you have entered their territory. Half-hearted calling indicates that although it is their territory they have yet to nest. Excited and frequent calls generally means a scrape is there, possibly with eggs.
	Excited/ frenzied cheeping.	You are in their territory and they have eggs or chicks.
	Birds run in front of you, and pausing to see if you are following ('rat run').	A nest with eggs is close by or chicks are hiding. The adult dotterels are trying to lure you away.
	Bird pretending to be injured. 'Broken wing' is common. 'Dying bird' is sometimes displayed.	Nest with eggs is very close and/or eggs are very close to hatching. Stop immediately and carefully look at where you are going to walk.
	Two birds flying, circling and calling.	The eggs have hatched and the chicks are close (usually on the ground in between the two calling parents).

4 Dotterel Monitoring

Dotterel monitoring should ideally be undertaken by an ecologist with shorebird experience. Attendance of the Dotterel Conservation Management course is recommended. Check the Miranda Shorebird Centre website to see when these courses are being held.

Monitoring can be used to meet one or more of the objectives listed below:

- To identify any dotterel breeding pairs establishing on or adjacent to NZTA land.
- To establish where dotterel eggs or chicks are.
- To record how many dotterel chicks fledge successfully.

Standard survey methods to be applied to all monitoring are described in the following sections. How to meet the specific objectives listed above is summarised in Table 3.

4.1 General guidelines for monitoring shorebirds

4.1.1 Observe from a distance

Where possible, observe birds from a distance. You are likely to get a more accurate idea of where their nest is and see chicks if they are present. This approach reduces risk to the dotterels as predators can be attracted to human activity and smell.

Observing from a distance is particularly useful when there are a number of dotterel breeding territories close to one another. When disturbed dotterels tend to fly near the disturbance and display away from their nests. This makes it difficult to pinpoint where their territory is. Birds from nearby areas may also come over to investigate, adding to the confusion. By seeing the birds undisturbed there is a greater chance of getting an accurate picture of where each pair has a territory and location of their scrape.

Figure 10: Monitoring from a distance (A) allows the observer to see birds undisturbed and get a more accurate idea of breeding territories than observing close (B).

4.1.2 Weather and duration of checks

Both eggs and chicks are susceptible to weather extremes. If eggs or small chicks are exposed to hot or cold temperatures for extended amounts of time they can be put at risk.

Limit the time that a pair of dotterels are disturbed to 30 minutes in normal conditions, 10 minutes at the most in cold and hot conditions. Rain is particularly dangerous to eggs and young chicks. If it is raining postpone the monitoring till conditions are more suitable.

4.1.3 Tides

It is recommended that monitoring be undertaken both at low tide and high tide. Different information can be gathered as described below, building a more accurate picture of what dotterels are doing.

High Tide	At high tide you can see which birds are in the area ('roll call'). Early in the season (June, July) post breeding flocks can be observed, and any chasing, plumage colouration change noted. Dispersal of birds from the post breeding flock to their territories can be observed and recorded. If two birds (a pair) are noted in an area during the breeding season they may be prospecting. It is easier to see them at high tide rather than at low, when they are both likely to be out feeding. If the pair are present after a number of visits it is likely they have set up a breeding territory.
Low Tide	If a dotterel seen at high tide is still at the same site at low tide (rather than out feeding) it is a strong indication that the bird is protecting something. When a pair of dotterels have eggs or chicks it is less stressful for them if the monitoring takes place at low tide, particularly when alongside the motorway. This is so they are not crowded in and have more space to get away from the observer.
Mid – High Tide	When chicks are more mobile it is useful to monitor at mid-high tide. This is because at low tide they can be hard to see, particularly when mangroves are present, and at high tide the parents can get very agitated if they are crowded.

4.1.4 Observer etiquette

- Watch every step you take. Eggs and young chicks are well camouflaged.
- Observe adult dotterel behaviour (Section 3.3.2) and use this to understand where nests/chicks are likely to be.
- If you find a nest, continue walking past noting if there are eggs, and approximate position. Do not stop next to it. Predators can be attracted to human activity. Gulls become suspicious when they see people, and ground predators such as rats and stoats follow human tracks.
- Unless absolutely necessary do NOT mark nests. Marking nests can disturb the birds and it can also be helping predators find a nest. If there is no other option than to mark the nest then make sure markers are at least 10 m away from it.
- Be aware that birds may be elsewhere (e.g. out feeding) so may take a few minutes to realise you are there. Keep an eye on the time, taking into consideration the weather conditions (4.1.2).

Table 3: Dotterel survey methods

Aim of survey:	Early detection	Location of scrape/ eggs	Presence of chicks
Description	To know where dotterels are and keep people informed. Works are programmed at a site. Dotterels are to be deterred from breeding there.	To protect the nest from being disturbed or destroyed. To monitor success of dotterel management programme.	To locate chicks so they are not in danger of work activities and disturbance. To measure success of dotterel management by number of chicks fledged.
When to survey	July – February Some birds start early in the season whereas others start later. Also some birds that breed early double-clutch, with the second clutch being later in the season.	July – February Monitoring early allows you to become familiar with individual birds. By detecting scrapes early monitoring can be done quicker at the more crucial time of when eggs have been laid.	August – March
Tides	High Tide High tide monitoring can be considered 'roll call' where birds in the area can be seen more easily. If you see birds at high tide and they are still present at low tide there is a high possibility they have already set up a breeding territory.	Low and High Tide If a bird that has been defensive at high tide is still present at low tide rather than out feeding it is likely to be protecting something.	Mid-high tide Birds are likely to be out feeding with their chicks but reasonably close to shore if the tide is in. At low tide spotting chicks can be difficult. High tide can be stressful for the birds.
Frequency	Weekly	Twice –weekly	Weekly
What to survey	Look for dotterels on sites where work is planned. See if they show breeding behaviour as per Table 2.	Look for dotterel pairs and locate their scrape. Check the scrape for eggs by walking past it.	Check dotterel chicks and monitor till they have fledged.
What to record	• Date, time, location, tide, weather • Number of dotterels • Displaying to observer or other birds. • Any bird bands • Any breeding plumage	• Date, time, location, tide, weather • Number of dotterels • Behaviour • Any bird bands • Location of scrape • Eggs, chicks present	• Date, time, location, tide, weather • Number of dotterels • Displaying to observer or other birds. • Any bird bands • Chicks present and their behaviour

4.2 Reading bird bands

Bird bands are a way individual dotterels can be identified. Metal and coloured plastic bands are used in unique combinations. Table 4 shows the seven bird band colours used and how they are to be recorded on observation sheets. Not all dotterels are banded. Birds that do not have bands are recorded as 'Un-banded' (UB).

When recording the combination, move from the birds left to right, and from top to bottom. For example, Figure 11 shows the bird as being the band combination of GM/OB and Figure 12 shows WO/YW.

Table 4: Bird band colours and their recording code

Orange	O	Yellow	Y	Black	K
Red	R	Green	G	Metal	M
Blue	B	White	W	Un-banded	UB

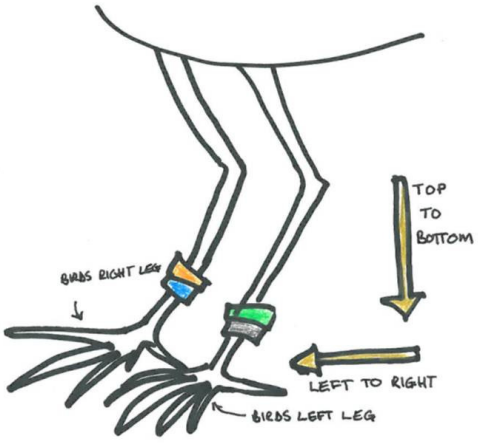


Figure 11: How to read bird bands

Figure 12: Dotterel WO/YW

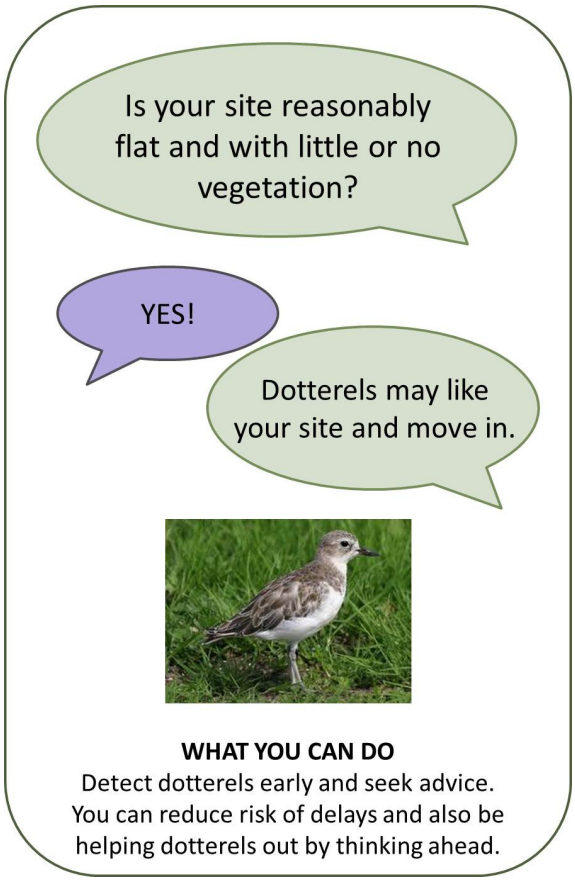
5 Dotterel Management for Construction Projects

Dotterels can successfully raise chicks on a construction site without causing delays to a project. Early detection and seeking advice is the key to successfully managing dotterels on construction sites.

Experience has shown that dotterels will establish on or close to construction sites, even when there are no historic records of the birds being there. Sites that are particularly appealing to dotterels are those that are reasonably flat with no or little vegetation cover. A construction site which has a combination of short grass, bare ground and a bit of a wetland (e.g. boggy patch) are ideal for dotterels. Construction sites that have been occupied by dotterels in the Auckland area include stockpiles, newly cleared earthworks sites and an inner city waste site.

Dotterels set up breeding territories before the earthworks season begins. If you detect dotterel activity early on there are opportunities to manage the site so they do not nest at areas that are going to be worked. The earlier you detect the birds, the more options there are and the less chances of delays to work or harm to dotterels.

The flow chart (Figure 13) shows the process of making decisions regarding dotterels and site management. Each situation will need to be looked at individually and discussed with an ecologist and possibly Department of Conservation if work is programmed where dotterels have set up their breeding territory. The following sections describe management options depending on whether dotterels have just arrived or whether they have nests, eggs or chicks.



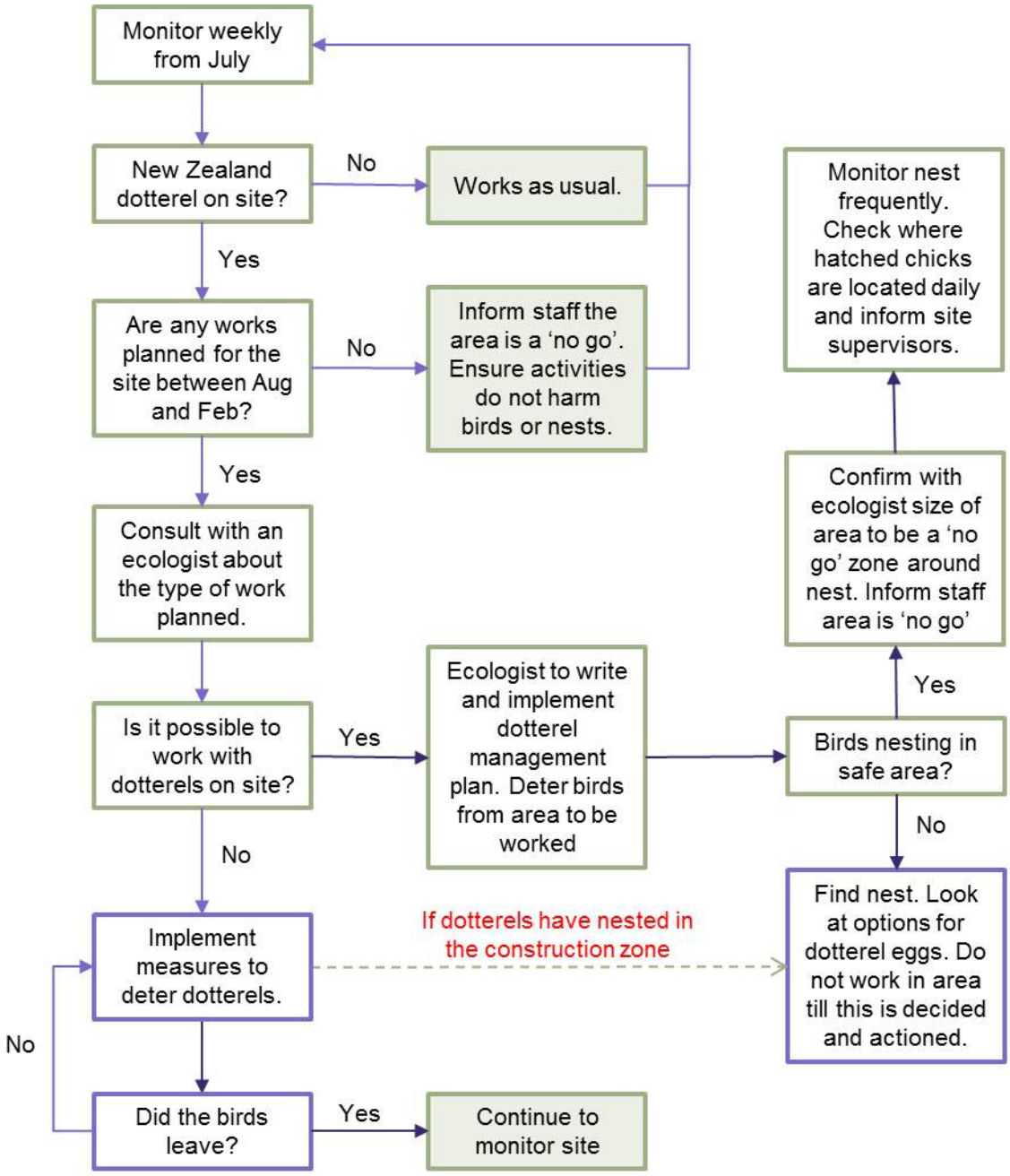


Figure 13: Decision flowchart for the management of dotterels on construction sites.

5.1 Adult dotterels prospecting on site

From July onwards dotterel pairs start looking (prospecting) for a suitable breeding territory. Planning ahead is crucial to successfully manage sites where dotterels are present so that both dotterels and the work planned are not affected.

- From July onwards check the site weekly for the presence of dotterels (see Section 4).
- Make any area that will need to be worked less attractive to dotterels by applying one of the more successful methods described in Table 5.
- If you think dotterels have already established on your work site contact the Environment Team and/or Department of Conservation (DOC) to verify whether dotterels are definitely there.
- An ecologist is to check whether there is a nest and eggs already there. If eggs are present see Section 5.2.

Various methods that have been employed to deter dotterels from setting up breeding territories are summarised below, indicating how successful they have been.

Table 5: Methods for deterring prospecting dotterels

Method	Description	Suitable For:	Success	Comments
Dog	Walk a dog on a leash and disturb adult dotterels.	All sites.	Success	Walk dog throughout the day for a number of days.
False hawk	Use a 'false hawk' to circle the area.	Where it won't interfere with traffic or overhead lines.	Unsuccessful	It worked for a short time and then the birds got used to it.
Long grass	Allow grass to grow long so not considered by dotterels to be a good place to lay eggs.	Sites that will be worked at some point during breeding season that have existing grass.	Success	Grass has to be long. It should be left to grow from at least April before the earth works season.
Machinery	Park large machinery close to where dotterels are showing an interest. Start the engine from time to time.	Construction sites with large machinery.	Moderate	Machinery cannot be left for long periods or the birds may get used to it.
Silt fences	Erect shade cloth at knee height. Place in rows. Space at 5– 10 m.	All sites.	Success	They block the birds' view Hay bales could potentially be used.
Metallic tape	Tape/ streamers that flutter when there is wind.	All sites	Moderate	It worked for 3 weeks then the birds got used to it.

5.2 Eggs found within the construction zone

- If eggs are found on the ground within the construction zone activities within 50 metres of the nest are to stop immediately and people are to leave the area.
- Contact the Environment Team.
- If you need to mark the nest in order for the Environment Team to find it make sure markers are at least 10 m away from the nest. Use two on either side of the nest if necessary as long as they are at least 10 m away.
- The Environment Team is to investigate any potential dotterel nests as soon as possible.
- If possible, works are to be delayed till after the eggs have hatched and chicks are able to be safely herded from the construction site. Discuss this with the Environment Team.
- If eggs present in an area that has to be worked there are a number of options. These will need to be discussed with and undertaken by a suitably experienced ecologist, and depending on the proposed action approval from Department of Conservation may be required (e.g. moving eggs).
- Depending on the nature of the job (duration, disturbance level), weather, and the individual birds it may be posible to undertake some tasks near a dotterel nest. Weather is a key factor. Because of this decisions on whether to proceed are to be made the day work is to be carried out. This reduces the risk of unexpected bad weather negatively imnpacting upon dotterel eggs or chicks. Section 4.1.2 gives an indication of weather and length of time birds can be off their nest.
- If the nest is located in an area that will not be affected by works then cordon off an area using tape and markers. The area should be at least 10 m x 10 m in size with the nest situated in the middle. Make it clear that no person or machine is to enter the marked out site. No work is to occur within 50 m of the nest, unless it has been discussed with an ecologist and approval given.
- If the nest is in an area that has to be worked within the next 32 days see the sections below and discuss options with Department of Conservation. Any dotterel management requiring eggs or chicks to be moved needs permission from DOC and be undertaken by a suitably experienced ecologist.

5.2.1 Moving nests within the construction zone

Shifting nests a short distance may be feasible in some situations, subject to consultation with DOC. For example, the nest with eggs in it is 5 metres away from being in a safe area (non-worked area). It is illegal to interfere with protected wildlife so DOC MUST first be consulted with and permission granted. An experienced ecologist, approved by DOC is to undertake the work

5.2.2 Taking eggs into captivity

Very few dotterels that have hatched in captivity have successfully been re-released into the wild to breed. Because of this taking eggs into captivity should be considered the absolute LAST resort.

If it is agreed by the ecologist that the only option is to take the eggs into captivity DOC is to be contacted on 09 307 9279. They will contact Auckland Zoo and arrange to come out and collect the eggs. The eggs are to be left till DOC is able to come and collect them. No work is to be undertaken within 50 m of the eggs until they are collected.

5.3 Chicks found within the construction zone

If chicks are in a work area and are at risk there are a number of options:

1. Delay work until the chicks have fledged (approximately 6 – 7 weeks from when they hatched).
2. Delay the work till the parents have moved the chicks from the work area.
   - If there is a disturbance the parents are likely to move the chicks away from it at night.
   - Make sure the parents are able to move the chicks without them being trapped or boxed in.
3. Monitor where the chicks are each day and keep a close eye on them while undertaking work so they are not in any danger. This option is only for chicks that are 10 days or older as very young chicks tend to hide and can be difficult to see.
4. Gently herd the chicks to a safe area.
   - Herding is to be done by an experienced ecologist.
   - Herding is to be done in full view of the chicks' parents at all times.
   - The timing of the herding will depend on the age of the chicks and the weather conditions.
   - Chicks should ideally be at least 10 days old.
   - Check for chicks early morning each day in case the parents shift them back to the site.

D. Slaven

Figure 14: This dotterel and its mate successfully raised 2 chicks on a central city construction site.

6 Dotterel Management for Maintenance and Operation Contracts

Dotterel are known to breed along the verge of live motorways. Although they have their usual haunts they can suddenly occupy an area where they have not been before. It is important that known sites are managed to assist breeding birds and new sites are identified promptly so risk to eggs and chicks is managed.

6.1 Monitoring

Monitoring of birds is to be undertaken as per Section 4, following Table 3 depending on what questions the monitoring is to help answer. The datasheet housed in Appendix C is to be filled out on site and entered into a database upon returning from site.

6.2 Communication and staff training

Communication is pivotal to dotterel management on a network where staff, subcontractors and third parties/ services undertake different tasks and have the potential of working in a dotterel area. What a dotterel looks like, where they are and what time of year they are vulnerable needs to be communicated. Appendix A houses a template of how dotterel Information can be communicated to staff. Staff are to be informed of where dotterels are breeding and of any access or work restrictions in place.

6.3 Working at known dotterel sites

Any work needing to be undertaken at known dotterel breeding sites are to be programmed so they avoid the dotterel breeding season. This goes from approximately August to February inclusive. For works that have to happen within the dotterel breeding season the Environment Team must be consulted. Known dotterel breeding sites are to be housed in Appendix D.

The Environment Team is to check the site where works are planned and surrounds for signs of nesting, eggs or chicks. If satisfied that working at the site will not affect dotterels they are to advise the project manager of conditions that will apply when working in a dotterel area.

General conditions applied to all work at dotterel breeding sites during breeding season are:

- Work is to occur only after permission has been given by the Environment Team.
- For coastal breeding sites check the tide table. Works are to occur 2 hours either side of low tide. This is so birds are not crowded in by the high tide. This can stress them and also make them run onto the carriageway.
- If dotterels or other shorebirds (e.g. variable oystercatchers) are disturbed by the works and look to be in danger of harming themselves (e.g. flying over/ walking onto the carriageway) works are to cease. Contact the Environment Team to discuss options.
- Depending on the nature of the job (duration, disturbance level), weather, and the individual birds it may be possible to undertake some tasks near a dotterel nest. Weather is a key factor. Because of this decisions on whether to proceed are to be made the day work is to be carried out. This reduces the risk of unexpected bad weather negatively impacting upon dotterel eggs or chicks. Section 4.1.2 gives an indication of weather and length of time birds can be off their nest.

6.4 Finding eggs

If you find a nest with eggs on the ground, stop work and call the Environment Team immediately. Stop any work happening within 50 m of the nest. Memorise the location of the nest by looking around you and finding existing distinctive features (e.g. a big rock close by, distance from the boundary fence). If you have a camera or camera phone take a photo with objects in it that can be recognised later on. If absolutely necessary you can put in a marker but it is to be at least 10 metres away from the nest. If there is too much disturbance the adult birds may abandon the nest. Try not to be around the nest too long as predators such as rats are attracted by human smell.

7 Predator Control

Predation of eggs, chicks and adults is one of the main threats to dotterels. In one study 60% of nests failed due to predation. Undertaking predator control is key to the dotterels survival.

Predator control programmes tend to concentrate on key mammalian predators (stoats, cats, hedgehogs, possums and rats). A combination of kill traps and bait stations is the standard control method used for rats, stoats, possums and hedgehogs. For cats, live traps must be used for NZTA as there is a risk of catching someone's pet.

The predator control programme is to be set up by a qualified pest control contractor, liaising with an ecologist. It is recommended a predator presence/absence survey be undertaken to identify which predators should be targeted. The following requirements need to be taken into consideration.

- Predator control should start about 4 weeks before the dotterels start nesting. Traps and bait stations are to be checked twice per week for the first 4 weeks and then once per week.
- Where there are chicks kill traps should be left unset to eliminate the risk of chicks taking shelter in the tunnels and being killed.
- Anyone checking traps must be careful where they walk and have some understanding of dotterel behaviour. This has the added benefit of having another set of eyes observing them and increases the chances of finding nests.
- Finish predator control when most chicks are fledged.

Figure 15: Trap and bait station set for rats on City of Cork shell banks, North Shore

8 Opportunities

There may be opportunities for NZTA to assist dotterels by taking them into consideration in the early stages of project planning, and not just in areas that they are known to already utilise. Dotterels have been shown to take the initiative and find new and unconventional places to breed. This can be encouraged by providing the following:

- Landscape designs that use low-growth vegetation near flat and boggy areas. This includes exotic grass. Dotterels like open, reasonably flat areas where they can easily see any potential predator. They also like 'wet' areas. If the project has land that has all three of these characteristics dotterels may utilise it. Managing vegetation can encourage dotterels to use areas where they are safe and discourage them from areas that aren't safe or are not practical from a people perspective.

- If dotterels do look to be in the area, predator control can help them out no end. This also includes educating people who live in the area about the damage their pet cat can do. Cat owners should be encouraged to keep their cats inside at night time. This reduces the chances of their cat catching a dotterel as most adult dotterels are killed by predators at night. It also decreases the chances of their cats being run over at night and early morning. A win-win situation.

- Educating people who may affect dotterels is key. Dotterels are increasing on the east coast and beaches north of Auckland. Because of this the chances of people and their dogs coming across them on beaches and disturbing them also increases. Simple actions can be the difference between a pair of dotterels successfully raising their chicks to fledge and their efforts failing.

- With dotterels establishing breeding territories in non – traditional sites such as parks and earthworks sites education needs to extend to people who may affect them. An example is Albany, where people parked on grass areas during the Rugby World Cup, and as a result a number of dotterel chicks were lost.

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Photo credits

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Appendix A

Dotterel Information for Site Staff

NZ Dotterels

The NZ Dotterel is an endangered shorebird found only in New Zealand.
NZ Dotterels used to be common but they are now threatened due to habitat loss, predation by introduced mammals such as stoats, rats and cats, and disturbance during breeding. Dotterels, including eggs and chicks are protected by law.

There are NZ dotterels at [insert location]!

[Enter specific information about the site here and anything about the individual birds.]

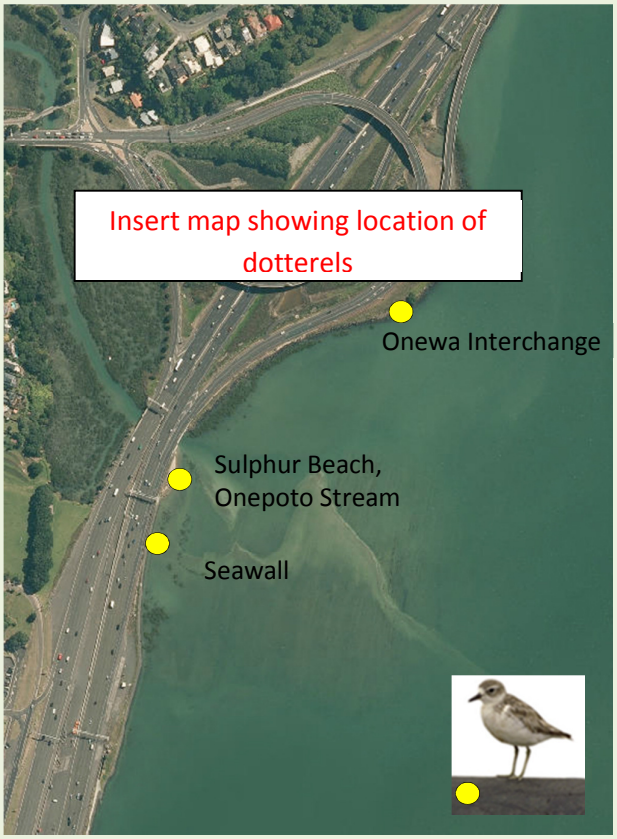
Dotterels are pale grey-brown on the back with off-white under parts.

During the breeding season dotterels start colouring up and have orangey plumage.

Other Ecological Assets to look out for

E.g. Variable oystercatchers breed in the same area as dotterels around the same time of year.

Variable oyster catcher



NZ Dotterels

NZ dotterels are vulnerable during breeding season - August to late February

You Can Help

- Any work should be done at low tide.[if relevant]
- Be aware of any special instructions to do with dotterels and dotterel areas.
- Keep away from dotterel areas where possible.
- Be careful where you step. Eggs are extremely camouflaged so be safe and only walk [specify areas safe to walk, if any].
- Insert instruction specific to site.
- If dotterels or variable oystercatchers start displaying strongly (see orange box below) or start running onto or flying low over the carriageway back away till they calm down and call [Name] (Environment) on ph number.

Eggs

Eggs are well camouflaged and hard to see when on sand, stones or grass.

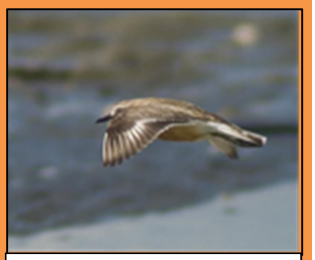
Dotterel eggs and variable oyster catcher eggs look similar. Dotterel eggs (see photo) are slightly smaller and more rounded than oystercatcher eggs.

Reading the Signs

Calling frequently and looking agitated.

Running in front of you, hunched looking.

Pretending its injured, such as a broken wing.



Flying around and calling.

The NZ dotterel is in the same National Threat Category as the kokako and the North Island Brown Kiwi!

Appendix B

Other Birds Seen on NZTA Land

Other Birds on the Network

Variable oystercatcher (VOC)

VOC's generally breed on sandy and rocky substrate close to the sea. Adults have long orange bills and bodies which are mainly black. They may have white markings on them (hence 'variable'). Eggs are similar looking to dotterels but are larger (52 – 59 mm).

Spur-winged plover

Spur-winged plovers nest on grass areas. They have distinctive colouring and tend to have a noisy call. Their eggs are khaki-coloured with brownish-black spots and blotches. They are around 49 x 31 mm. Parents will defend their nests by swooping on intruders.

Banded dotterel

Banded dotterels breed in different habitats than NZ dotterels (shingle riverbeds). Banded dotterel and NZ dotterel can be in the same area. Banded dotterels are smaller and have a black chin strap.

Because of where banded dotterel breed you will not come across their eggs on Auckland construction sites.

Pukeko

Pukeko have distinctive blue plumage and red bill, legs and feet. They have 4 to 9 buff coloured eggs.

Pied stilt

Pied stilts lay 2 – 5 greenish eggs that are a similar shape and size to dotterel eggs. They tend to next in groups. If you are close to a stilt nest they tend to be very vocal and will sometimes dive-bomb.

White faced heron

White-faced heron are often seen near the coast foraging. They nest in big tree's. The nest is an untidy looking bundle of sticks and twigs. . They lay 3 to 5 pale blue-green eggs. Generally only 2 chicks will survive.

Appendix C

Shorebird Monitoring Sheet

Date and tide	**Location**	**No. of birds**	**Male**	**Female**	**Clutch number**	**No. of eggs**	**No. of chicks**	**No. fledged**	**Comments**
Date of visit, tide level and weather	Location and site within location	How many birds are present in the territory? Both birds of pair? Do you suspect nesting? Breeding plumage?	Male bands if banded	Female bands if banded	Which clutch, eg: 1st or 2nd	If nest found, how many eggs present?	No. of chicks seen during a visit (you may not see all chicks every visit)	No. of chicks that you suspect to have fledged, ie have left the area.	Note any interactions with other species and keep an eye on their breeding success, eg oyster catchers, gulls etc. If nest not successful record suspected/known cause

Date and tide	**Location**	**No. of birds**	**Male**	**Female**	**Clutch number**	**No. of eggs**	**No. of chicks**	**No. fledged**	**Comments**
Date of visit, tide level and weather	Location and site within location	How many birds are present in the territory? Both birds of pair? Do you suspect nesting? Breeding plumage?	Male bands if banded	Female bands if banded	Which clutch, eg: 1st or 2nd	If nest found, how many eggs present?	No. of chicks seen during a visit (you may not see all chicks every visit)	No. of chicks that you suspect to have fledged, ie have left the area.	Note any interactions with other species and keep an eye on their breeding success, eg oyster catchers, gulls etc. If nest not successful record suspected/known cause

Appendix D

Known Dotterel Breeding Sites

[Insert maps showing known dotterel breeding sites and post-breeding flocks]

Appendix E

Useful Contact Details

Name	Details

Name	Details