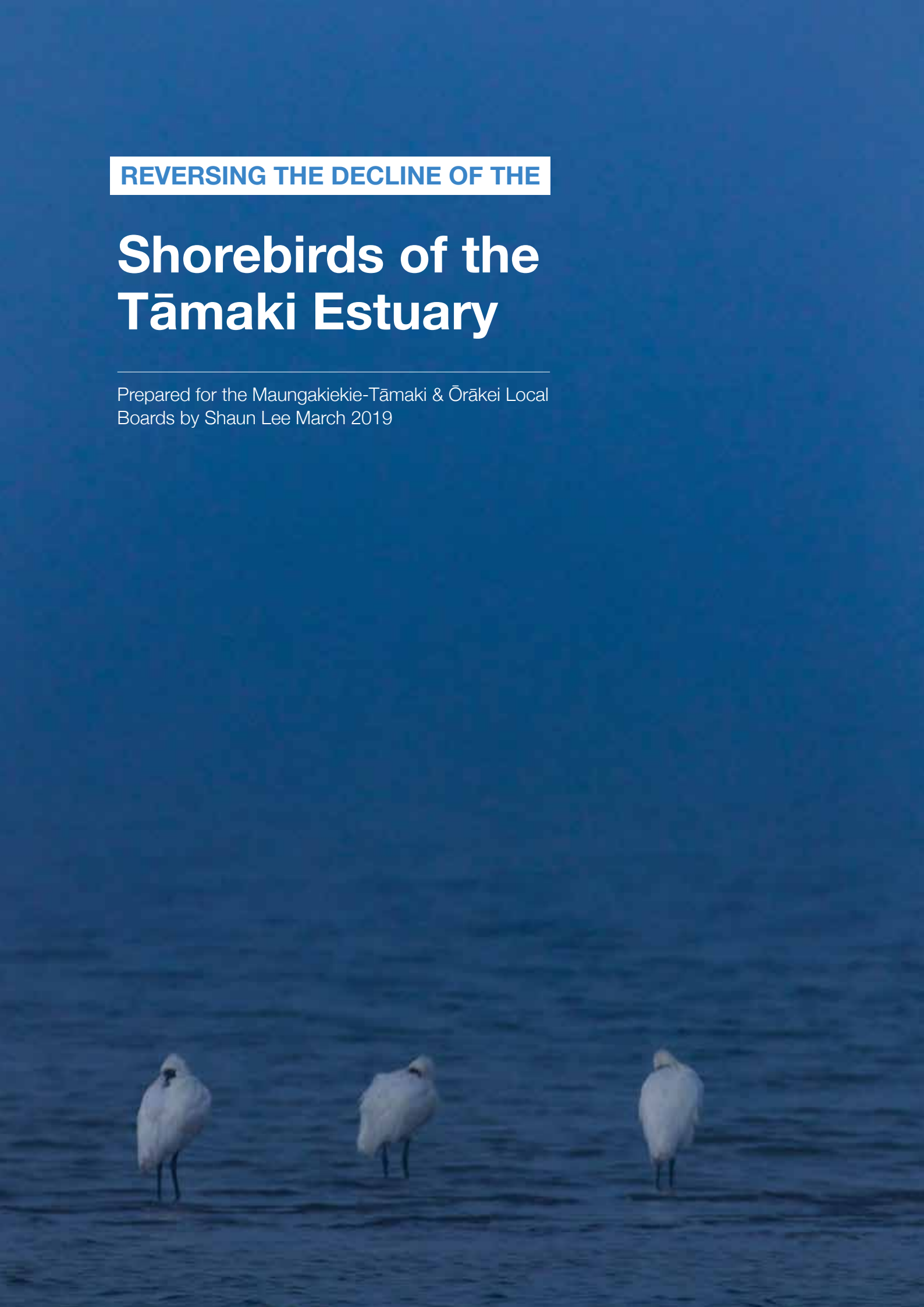
REVERSING THE DECLINE OF THE

Shorebirds of the Tāmaki Estuary

Prepared for the Maungakiekie-Tāmaki & Ōrākei Local Boards by Shaun Lee March 2019



The author: Shaun Lee is a citizen scientist, he has completed multi-day birding workshops at the Pūkorokoro Miranda Shorebird Centre, minds dotterel, participates in Birds New Zealand wader censuses and other shorebird related events.

This report is not: A scientific analysis of the collected data.

This report is: A overview of the current situation and with clear direction on next steps.

A review by a qualified shorebird expert is recommended before any management action is taken.

This report would not have been possible without the help of a lot of bird counters. Thank you all for the early mornings and late nights.

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COVER PHOTO: Three Royal spoonbill roosting in the early morning mist at Tahuna Torea.
BACK COVER PHOTO: Northern New Zealand Dotterel roosting at a construction site on Highbrook Drive.
All photos by Shaun Lee unless otherwise stated.

CONTENTS

Introduction Pg .04

Which shorebirds use the Estuary? Pg .06

How do shorebirds use the Estuary? Pg .10

How did shorebirds use the Estuary? Pg .35

Advice from New Zealand's shorebird experts Pg .57

Recommendations Pg .59

Appendix Pg .62

Introduction

"The dominant wildlife in the area has been omitted from the Open Space Network Plan. Please seek further advice on the Open Space Network Plan from a shorebird expert at Auckland Council. We request that open space for shorebirds should be provisioned within the plan."

– Tāmaki Estuary Environmental Forum, December 2017

"The Maungakiekie-Tāmaki Local Board are aware that community groups and individuals have identified gaps in the OSNP and that the board will be able to identify specifically when it consults the community on this plan. There will be an opportunity to provide feedback during this consultation also. There has been a delay in getting this consultation off the ground, it is expected to begin in June/July 2018. There have been no decisions made on the OSNP and that the board do have a list of concerns when they are approving the plan."

– Maungakiekie-Tāmaki Local Board, May 2018

This report has been voluntarily written for the Maungakiekie-Tāmaki Local Board who are yet to seek advice from a shorebird expert at Auckland Council in developing their Open Space Network Plan (OSNP).

It recommends:

1. **Shorebird expert to review this report.**
2. **Local Boards commit to reverse declining shorebird numbers.**
3. **OSNP revised with dedicated and enhanced shorebird roosts.**
4. **Serious investments in shorebird roost protection and enhancement.**

Dawn at Tahuna Torea

Maungakiekie-Tāmaki is a special part of Auckland but it's not known for its wildlife. We have lost our majestic forests and don't have any native bats, lizards or frogs left. When we lost those forests we lost all the special birds that the Deparment of Conservation look after like Kiwi, Takahē, and Kaka. And we are not likely to ever get them back.

What we do have left is a beautiful Estuary. And although the bird numbers have dropped dramatically in the last few decades there are still some left.

"Unlike the Manukau and Waitemata Harbours, the Tāmaki Estuary has very few high tide roosts for shorebirds. The carrying capacity of intertidal areas for shorebirds is linked to the proximity of good high tide roosts. If roosts are degraded or lost, the numbers of shorebirds using the adjacent intertidal feeding areas may decline."

– Dr Tim Lovegrove (2016)

This study doesn't look at the Southern End of the Tāmaki Estuary because it was focused on roosting behaviors and the Southern end is closer to the Manukau roosting areas. The study does include Browns Island / Motukorea which sits at the mouth of the Estuary and is predator free and managed by Auckland Council.

The study uses standard high tide count method used by Birds New Zealand but also introduces two new variations.

1. A low tide count via boat an hour either side of low tide with binoculars or telephoto lens. Starting in the North of the Estuary and accounting for any birds that might fly past as we traveled South.
2. A night count using thermal imaging and night vision monoculars.

Bird counters went to great effort not to disturb the birds which can create counting errors.

Which shorebirds use the Tāmaki Estuary?

A wide variety of species use the Estuary. Some species move about in large flocks, others are found in much smaller numbers. The Department of Conservation monitors the national populations of birds and classifies species risk of extinction as illustrated in ***Fig 01.***

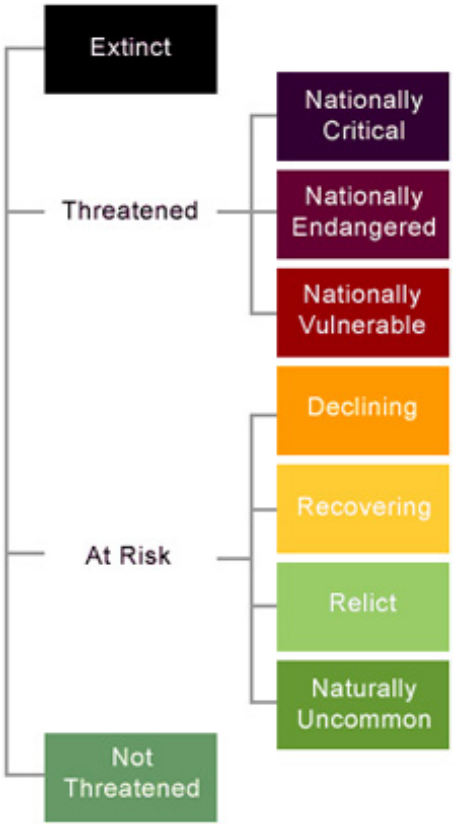
Any species not in the green warrants particular attention. Small things we do a regional level can lead to the incremental losses and drive a species toward extinction at a national level, this is particularly important for endemic species (species that are not found anywhere else in the world). Two species in the Estuary are conservation dependent, this means that without human help they will go extinct (usually because of predation from introduced predators like rats & cats).

Although gulls, terns and shags are not strictly shorebirds they are counted by Birds New Zealand members when we do counts, so have been included in this study.

Red-billed gulls are the dominant bird in the Estuary. Their numbers are only just beaten by South Island Pied Oystercatchers (SIPO) in the winter but only when counted at high tide. This study added low tide and night time counts to get a broader understanding of how birds use the Estuary.

Southern black-back gulls are the next dominant species then Pied stilts but only at high tide. A low tide count in the summer of 2019 (by boat) found 162 Bar-tailed godwit showing they do use the Estuary but are not often seen as they no longer regularly roost in the Estuary.

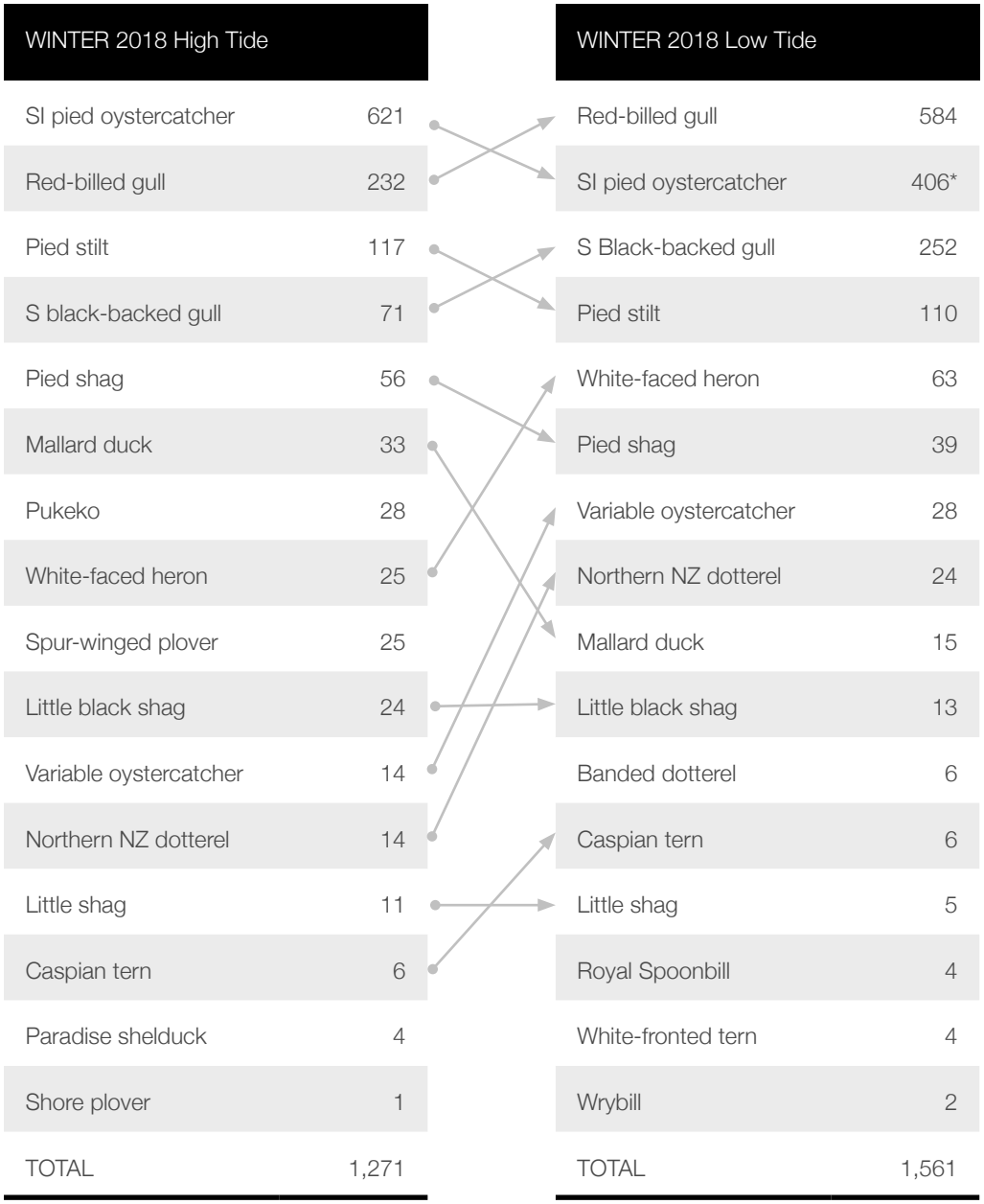
Shore plover, Banded dotterel, Northern New Zealand Dotterel and Wrybill are similar sized birds with similar behaviors, needs and threats. It's clear from ***Fig 01*** that more should be done to help this group of birds.



SPECIES	CONSERVATION STATUS
Red-billed gull	Declining
Southern black-backed gull	Not Threatened
Caspian tern	Nationally Vulnerable
White-fronted tern	Declining
Banded rail	Declining
Pukeko	Not Threatened
Paradise shelduck	Not Threatened, E
Mallard duck	Introduced and Naturalised
White-faced heron	Not Threatened
Spur-winged plover	Not Threatened
Pied stilt	Not Threatened
Royal Spoonbill	Naturally Uncommon
South Island pied oystercatcher	Declining, E
Variable oystercatcher	Recovering, E
Northern New Zealand dotterel	Recovering, CD, E
Banded dotterel	Nationally Vulnerable, E
Wrybill	Nationally Vulnerable, E
Shore plover	Nationally Critical, CD, E
Bar-tailed godwit	Declining
Pied shag	Recovering
Little shag	Not Threatened
Little black shag	Naturally Uncommon

CD = Conservation dependant
E = Endemic (not found overseas)

Fig 01. *The conservation status of shorebirds regularly recorded in the Estuary. Classification by DOC.*



WINTER 2018 High Tide		WINTER 2018 Low Tide	
SI pied oystercatcher	621	Red-billed gull	584
Red-billed gull	232	SI pied oystercatcher	406*
Pied stilt	117	S Black-backed gull	252
S black-backed gull	71	Pied stilt	110
Pied shag	56	White-faced heron	63
Mallard duck	33	Pied shag	39
Pukeko	28	Variable oystercatcher	28
White-faced heron	25	Northern NZ dotterel	24
Spur-winged plover	25	Mallard duck	15
Little black shag	24	Little black shag	13
Variable oystercatcher	14	Banded dotterel	6
Northern NZ dotterel	14	Caspian tern	6
Little shag	11	Little shag	5
Caspian tern	6	Royal Spoonbill	4
Paradise shelduck	4	White-fronted tern	4
Shore plover	1	Wrybill	2
TOTAL	1,271	TOTAL	1,561

Fig 02. *Variation in species numbers between high and low tide, winter 2018.*

*It's suspected that this number is low due to a flock of South Island pied oystercatcher feeding in the paddock at Point England Reserve.

Species	Summer 2017/18 High tide	Winter 2018 High tide	Winter 2018 Low tide	Summer 2018/19 Low tide	Winter 2018 High tide at night
Red-billed gull	46	232	584	670	16
S black-backed gull	27	71	252	314	26
Caspian tern	1	6	6	5	0
White-fronted tern	0	0	4	21	
Pukeko	88	28	0	0	19
Paradise shelduck	2	4	0	0	11
Mallard duck	37	33	15	36	22
White-faced heron	20	25	63	101	4
Royal Spoonbill	0	0	4	2	16
Bar-tailed godwit	0	0	0	162	
Spur-winged plover	42	25	1	3	24
Pied stilt	3	117	110	21	157
SI pied oystercatcher	200	621	406	289	644
Variable oystercatcher	54	14	28	29	6
Northern NZ dotterel	18	14	24	1	5
Banded dotterel	0	0	28	0	1
Wrybill	0	0	116	0	3
Shore plover	2	1	0	0	0
Pied shag	12?	56	39	20	2
Little shag	9	11	5	5	0
Little black shag	2	24	13	1	0
TOTAL	563	1,271	1,561	1,680	956

Fig 03. *Count variation by season and method.*

How do shorebirds use the Tāmaki Estuary?

A Northern New Zealand dotterel removing a worm from the intertidal mudflats

Red-billed gulls breeding under Panmure bridge.

Red-billed gull

Declining	Pop est.	600s	500s
		Summer	Winter

While driving between roosting sites during high tide counts, observers would often see Red-billed gulls on street lights and street corners. These birds remained uncounted until the low tide counts revealed more than double the amount of birds. This suggests at least half the gulls feed in suburban areas during high tide and move to the Estuary at low tide. Very little feeding was observed at low tide and the birds often flocked together in large social groups.

There is a large breeding colony under Panmure Bridge which has been estimated at 50-100 adults, however because this is less than half of the winter population and less than one fifth the summer population it warrants a better count. The site is best counted from a boat at sunset because the piles obscure half the colony from the shore, however during breeding season the boat will be dived on which makes counting harder.

A few Red-billed gulls also nest on boats near the bridge. The colony is currently threatened by construction on the Panmure Bridge.

It is unknown why the summer population was larger or if the expansion is regular. Nationwide gull populations have dropped since open rubbish dumps were largely closed in the 80s.
The national population has continued to decline including in areas that are hundreds of kilometers from cities like the colony on the Mokohinau Islands.

A Southern black-backed gull disagrees with a sign at Tahuna Torea

S black-backed gull

Not Threatened	Pop est.	300s	200s
		Summer	Winter

The low tide counts were even more effective for producing high numbers of Southern black-backed gulls with the summer count multiplying ten fold.

As with the Red-billed gulls they are often seen feeding in suburbia, it would be interesting to compare their behaviour in the Estuary with gulls far way from humans.

Although no predatory behaviour of Northern New Zealand dotterel has been observed at Point England Reserve by this species they can be a problem elsewhere.

There is a small breeding colony on Motukorea / Browns Island and it is suspected that they predate shorebird chicks on the island.

An unhealthy looking Southern black-backed gull at Tauna Torea spit

Two adult Caspian tern

Caspian tern

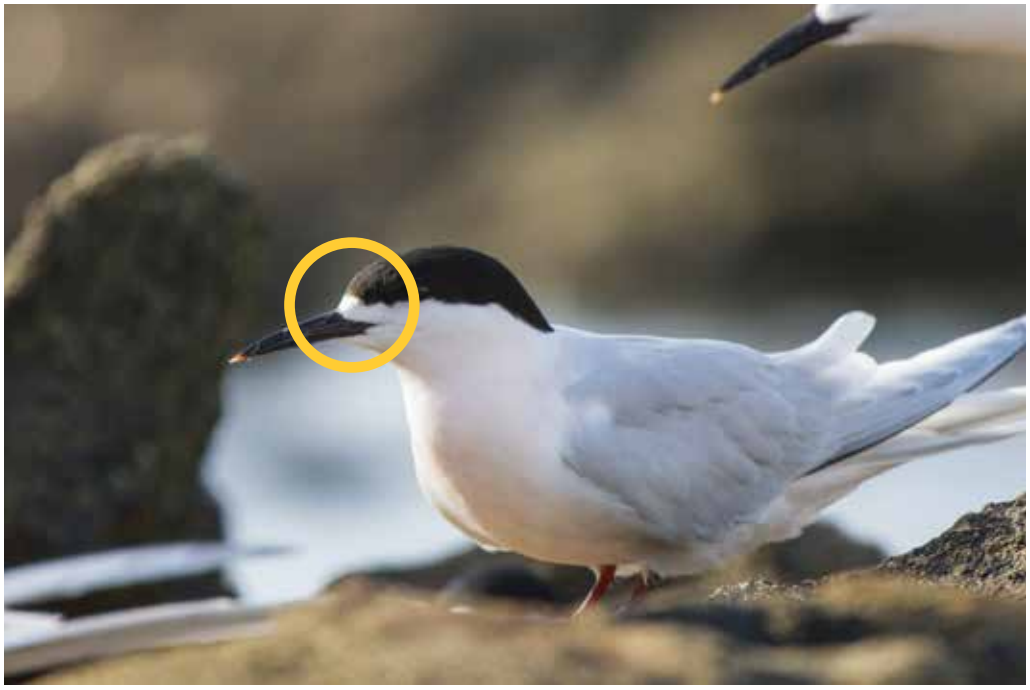
Nationally Vulnerable | Pop est. 5 Summer 6 Winter

This majestic tern can be regularly seen foraging in low numbers the Estuary.

Large numbers have been seen occasionally roosting in the Estuary in Feb/Mar. e.g. 14 at Tahuna Torea Reserve on 2/2/2019 and 40 at Point England Reserve 1/2/2019.

A breeding attempt was made on Motukorea / Browns Island late 2018 but was unsuccessful.

Breeding attempt on the wharf at Motukorea / Browns Island



The white front of a white-fronted tern.

White-fronted tern

Declining | Pop est. 21 (Summer) 4 (Winter)

These aerodynamic terns feed on smaller fish than the larger Caspian tern. White-fronted terns have nested in the colony of Red-billed gulls under Panmure Bridge for at least the last few summers.

Like the Red-billed gulls the nests have sometimes been on private boats and quite unwanted. This could be more proactively managed for both species as they are in decline nationally. Both humans and birds would benefit.

On any given day boats passing through the mouth of the Estuary will see at 4-10 white-fronted terns feeding. They are sometimes accompanied by an Arctic skua who chases them until they drop their fish. The Arctic skua will try and catch the fish in mid flight.

An Arctic skua near the mouth of the Estuary.

A pukeko at Point England Reserve.

Pukeko

Not Threatened | Pop est. 90+ 30+
Summer Winter

Pukeko are so abundant they may be hunted under license in New Zealand. They can be found in Australia where they came from about 1,000 years ago.

They are often seen foraging in the mangroves along the foreshore of the Estuary. They are also counted at shorebird roosting spots by Birds New Zealand.

Unfortunately they are a big problem for Northern New Zealand dotterel who did not evolve an defense against attacks from Pukeko. At Point England Reserve Pukeko are the only observed predators, taking both chicks and eggs.

A pukeko raiding a dotterel nest at Point England Reserve.

A female paradise shelduck at Point England Reserve.

Paradise shelduck

Not Threatened	Pop est.	2	11
		Summer	Winter

Although it's found no where else in the world this duck is so abundant it is regularly hunted. Paradise shelduck are one of few bird species that have faired well since humans arrived in Aotea. It can be found in paddocks and sports fields around the country and the Estuary too.

Breeding has only been recorded at Point England Reserve but it is sure to happen elsewhere in the Estuary too.

The discrepancy between summer and winter counts is unknown.

Paradise shelduckling at Point England Reserve.

Mallard ducklings at Tahuna Torea.

Mallard

Introduced	Pop est.	30s	30s
		Summer	Winter

The only introduced bird in this study. Acclimatisation Societies bred and released over 30,000 Mallards throughout New Zealand. They are now the most abundant waterfowl in the country and have hybridised with our native Grey duck.

The New Zealand grey duck population is believed to be extensively hybridised with introduced mallards to such an extent that few pure grey ducks may now exist, hence its "critical" conservation status.

– New Zealand Birds Online

Grey duck do not appear in the survey but have been recored (mostly as hybrids) at Tahuna Torea Reserve. See eBird records on ***Page 43.***

Mallards are most abundant at Tahuna Torea Reserve where they are both fed and well loved by the public.

A white-faced heron fishing in the lagoon at Tahuna Torea.

White-faced heron

Not Threatened	Pop est.	90s	60s
		Summer	Winter

These elegant birds self introduced from Australia in the 1940s. They are abundant in the Estuary at low tide feeding on small fish and invertebrates.

Fewer birds are counted at high tide as they roosts in trees. Large numbers (c30) have recently been counted at Tahuna Torea Reserve roosting in the Mangroves where they also feed. They also nest in trees but there is no significant forest bordering the Estuary, incidental observations suggest night roosting and breeding is scattered around the larger trees neighbouring the Estuary.

White-faced heron can also be seen regularly feeding in the paddocks at Point England Reserve in flocks of 10-20 but only in winter when the ground is wet.

Royal spoonbill feeding in the Estuary.

Royal spoonbill

Nat Uncommon	Pop est.	0	0
		Summer	Winter

These large exotic birds are quite the attraction. They self introduced from Australia last century and their numbers have been slowly growing. Sightings of them in the Estuary are often shared on Facebook as people want to see them.

Like the white-faced heron they are flexible with their sleeping arrangements and have been seen regularly at Point England Reserve and Tahuna Torea Reserve on sand/mud, in pools of water or high in the trees.

They do not breed or stay for long in the area and small groups of spoonbill usually just pass through the Estuary, staying no more than a few weeks.

Royal spoonbill at Point England Reserve.

Bar-tailed godwit feeding in the Tāmaki Estuary.

Bar-tailed godwit

Declining	Pop est.	160s	0
		Summer	Winter

These birds literally go to incredible lengths to feed in the Estuary flying 11,000-12,000km's in September every year. They stay until March when they fly back to Alaska to breed.

"Current count data indicates an annual national population decline of nearly 2%, the primary driver of which is extensive habitat loss at staging areas in the Yellow Sea region."

– New Zealand Birds Online

This Bar-tailed godwit will lose half it's weight during it's migration.

Decline in the Tāmaki Estuary is higher than the national rate at about 7 birds per anum over the last 48 years.

It is thought these birds roost and feed in the Manukau Harbour and take advantage of the difference between the East/West coast tide times to spend more time feeding. Gaining optimum condition before making the epic journey is of critical importance.

The daily commute for the Bar-tailed godwit is around 15km one way or 900km per month. Roosting closer to where they feed would help them gain condition for their migration faster.

During the study it was observed that some Godwit flew East at high tide, perhaps to a roost near Maraetai which is a similar distance to the Ambury Park roost.

Estimated flight path and distance of Bar-tailed godwits 'daily commute'. Aerial photography via Auckland Council GeoMaps.

Bar-tailed godwit don't roost with the SIPO at Tahuna Torea Reserve or Point England Reserve during the day. We have not conducted night surveys in summer (when the Godwit are here) but there is no evidence to support Bar-tailed godwit roosting in the Estuary at night. It's suspected disturbance and the small size of the roost at Tahuna Torea Reserve makes it no longer suitable. The roost is also unreliable being unavailable during storm surges and large tides.

Bar-tailed godwit have only been observed roosting at Point England Reserve once. The birds breed in grass and 'have been known to roost on grass in Millwater and Te Atatu' *(Trina Smith 2018, pers. comm.)* the biggest differences between Point England Reserve and the above sites are grass length and elevation but there may be some other factor that makes Point England Reserve less attractive to Bar-tailed godwit.

9 of 88 Bar-tailed godwit roosting on short grass in Millwater March 2019.

A Spur-winged plover defending its chick at Point England Reserve.

Spur-winged plover

Not Threatened	Pop est.	40+	20+
		Summer	Winter

These noisy Australian birds have spread throughout the country like an invasive species. First breeding in Invercargill in 1932 they can now be found breeding in sports fields, parks and the sides of motorways around Auckland.

There is video footage of a Spur-winged plover destroying a New Zealand dotterel egg. They had their protection removed in 2010.

A Spur-winged plover chick at Point England Reserve.

A Pied stilt displaying (towards an intruding photographer) at Point England Reserve.

Pied stilt

Not Threatened | Pop est. 20s 100+

Summer Winter

Found throughout Africa and Asia these gangly birds also have a strong population in New Zealand. They can breed in paddocks and do so at Point England Reserve. They have also been breeding on and off at Tahuna Torea Reserve for decades.

They feed in the Estuary at low tide and flock together to roost around the Estuary at high tide (day and night).

Pied stilt chick bred a Point England Reserve.

SIPO feeding safely in the paddocks at Point England Reserve.

SI pied oystercatcher

Declining	Pop est.	200s	600s
		Summer	Winter

South Island pied oystercatcher (SIPO) arrive in the Estuary from February where numbers slowly expand until early winter. Every year they fly more than 600km from the middle of the South Island where they breed in the grass. They feed in the Estuary when the tide is out then roost on the spit at Tahuna Torea Reserve or Point England Reserve. At Point England Reserve they have been observed feeding in the grass both day and night (using night vision and thermal cameras) and when the tide is out indicating the site is an important food source for the species. It is critical that the birds are in optimum condition before they make the flight back to the South Island in August.

Just over 200 non-breeding birds stay in the Estuary over summer, this is about one third of the winter population.

As with the Bar-tailed godwit we were expecting to see more birds in the Estuary at low tide and less at roosts with birds flying back to the Manuakau Harbour. This was true in summer but with only 144 of the 289 birds counted at low tide seen at high tide. But surprisingly 621 birds were counted at high tide during the winter but only 406 seen at feeding in the Estuary at low tide. Because 257 of the birds were feeding at Point England Reserve it's quite possible that some SIPO fly to Point England Reserve from the Manukau just to feed in the paddocks and skip feeding in the Estuary. In the summer months the ground at Point England Reserve is too hard for birds to probe / feed.

SIPO killed by a dog when the grass at Point England Reserve was not mowed and the birds had to roost on the sports fields.

"Total population estimated at 49,000 birds in 1970-71, but numbers increased subsequently and estimated at 112,000 birds in 1983-1994. More recent counts indicate that the total may have increased over the next several years, but has since declined to the 1988 level."

– New Zealand Birds Online

While the national population of SIPO has grown dramatically since the 70s the population in the Tāmaki Estuary has fallen sharply.

SIPO roosting inside a fence at Mount Wellington War Memorial Reserve during the lighting construction. Inside the fence SIPO are safe from disturbance. SIPO once roosted here day and night but have not been seen roosting at night here since the lights were installed.

Variable oystercatcher roosting with SIPO and Southern black-backed gulls at Point England Reserve.

Variable oystercatcher

Recovering	Pop est.	50s	20s
		Summer	Winter

Variable oystercatcher (VOC) are darker and larger than their Southern cousins. Although less abundant their population is recovering largely due to efforts to help species that they nest near like Northern New Zealand dotterel and the New Zealand fairy tern.

About 50 VOC can be found breeding on Motukorea / Browns Island every summer. Even though the island is predator free they are not very successful with only one reported fledgling in the last three years. VOC numbers were down in the low tide counts because the island was excluded.

VOC have been seen feeding in the Estuary, the rocks on Motukorea, and the grass at Point England Reserve.

Variable oystercatcher on Motukorea / Browns Island.

Northern New Zealand dotterel breeding at Point England Reserve.

Northern NZ dotterel

Recovering	Pop est.	10s	20s
		Summer	Winter

Thanks to a very successful dotterel minding program this adorable little bird has recently changed conservation status from Nationally Vulnerable to Recovering. It's a symbol of what can be done with education and predator control. This has been reflected in Tāmaki with birds returning to breed on the mainland this century. However the beaches have become hardened with man made structures like buildings, wharfs and retaining walls. So eight dotterel have chosen to regularly breed at Point England Reserve where there is open space and a water source.

Dotterel sometimes attempt to roost & breed on construction sites bordering the Estuary.

Dotterel also breed on Motukorea / Browns Island and have had their first success in three years this summer. The island is also home to the local post breeding flock. Between February-April more than 20 birds (1% of the global population) roost together on the island. Although the birds mate for life if a partner is lost new bonds can be made in the flock, young adults also meet partners here. The flock is also irregularly observed roosting at Point England Reserve. The odd dotterel has also been oberved roosting at both Tahuna Torea Reserve and construction sites during the day and at the Pakuranga Sailing Club at night.

The Northern New Zealand dotterel that breed at both Motukorea / Browns Island and Point England Reserve feed throughout the Estuary. Other small waders like Banded dotterel, Shore plover and Wrybill are often seen feeding and flying with them in the Estuary. Roosting together is also not unusual with Shore plover and Banded dotterel joining the flock at Point England Reserve. By flocking together these small birds gain extra security with more eyes alert for danger.

Productivity is measured by the average number of chicks fledged per breeding pair. Management is considered effective if productivity values are greater than 0.5 for three consecutive years or longer *(Dowding & Davis, 2007)*. At Point England Reserve it is 0, 0.25, 0 on Motukorea / Browns Island it is 0, 0 , 0.25. Breeding success is poor / not sustainable at both Point England Reserve and Motukorea. More should be done to help these birds.

A Northern New Zealand dotterel feeding on a Ribbon worm

Northern New Zealand dotterel are conservation dependent, this means that without human help they will go extinct (usually because of predation from introduced predators like rats & cats).

A Banded dotterel.

Banded dotterel

Nationally Vulnerable | Pop est. 0 20s (Summer Winter)

The population estimate for this species is poor and based on only one observation from this study. However 50+ birds were near Seaside Park on 13 June 2018.

"Banded dotterel come in from the Manukau Harbour either via the upper estuary and/or from the roofs they temporarily use. They usually rest up on the roofs for an hour or so and then depart to the East when the tide has fallen enough to start feeding. The advantage is that they are able to get an extra couple of hours feeding in a day utilising the 3 hour tide difference between East and West Coast."

– Tony Harbraken, pers. comm. 2018

A study of roof roosting would help our understanding of how this species is using the Estuary.

A mixed flock of Banded dotterel, Wrybill and Northern New Zealand dotterel flying south in the Tāmaki Estuary.

A wrybill.

Wrybill

Nationally Vulnerable | Pop est. 0 (Summer) 110s (Winter)

The population estimate for this species is poor and based on only one observation of 116 birds feeding at low tide.

One outlying observation was three Wrybill seen one night in July 2018 at the Pakuranga Sailing club.

Like with banded dotterel we think Wrybill come in from the Manukau Harbour utilising the 3 hour tide difference between East and West Coast.

A study of roof roosting would help our understanding of how this species is using the Estuary.

A mixed flock of Banded dotterel, Wrybill and Northern New Zealand dotterel flying south in the Tāmaki Estuary.

Shore plover at Point England Reserve.

Shore plover

Nationally Critical	Pop est.	1	1
		Summer	Winter

The Department of Conservation (DOC) have been regularly translocating Shore plover to Motutapu Island since 2012.

Because they are rare flocking birds it's no surprise that various individuals followed the Northern New Zealand dotterel flock to Motukorea / Browns Island and Point England Reserve.

Because of their critical conservation status of only 175 adults nowhere on the mainland is safe enough for them. They were not observed in any low tide counts but the Tāmaki Estuary is an enormous food resource for Shore plover and its likely they will continue to use it.

We have a responsibility to help DOC by providing a safe bird roost in the Tāmaki Estuary where they can roost with other small shorebirds.

"Two shore plover were killed by cat(s) at Bucklands Beach in 2013"

– Artyom Polkanov, DOC, pers. comm 2014.

Shore plover on the road at Tahuna Torea Reserve, March 2014.

A Pied shag at the Panmure basin colony.

Pied shag

Recovering	Pop est.	20s	50s
		Summer	Winter

In 1997 the Panmure basin colony had 300 adults. Corina Hooper at Pam Howletts Cormorant Sanctuary reported a population of only 10 adults in 2017. Juvenile birds were not identified in this survey but with winter counts of 49 and 54 its likely that Pied Shags are flying in from elsewhere to feed in the Estuary.

"There are quite a few other mainland pied shag colonies around Auckland, those closest to the city include the colonies at Waikowhai on the Manukau, at Purewa Creek on the Waitemata, at Western Springs Lake, at Chelsea Sugar Refinery Lake and at Lake Pupuke."

– Tim Lovegrove, pers. comm. 2017

Wild Pied shags are fed at Pam Howletts Cormorant Sanctuary. The future of the feeding programme and the sanctuary is uncertain.

Pied shag with fishing line attached.

Two Pied shags were observed roosting along Highbrook Drive at night.

It's tragic to see fishing damaged Pied Shags which are seen regularly both in the Tāmaki Estuary and elsewhere in the Hauraki Gulf.

Little shag drying its wings.

Little shag

Not Threatened	Pop est.	6	8
		Summer	Winter

"Populations of little shag have decreased markedly in the Auckland region where some colonies have disappeared since the 1980s or fallen below 10 pairs."

– New Zealand Birds Online

There is a very public Little shag colony at Tahuna Torea. Gillian Eller reported four occupied nests and six adults there in November 2017.

This species often nests with Pied shags but it is unknown if there have been co-located nests at the Panmure colony.

Little black shag roosting at Tahuna Torea Reserve.

Little black shag

Nat Uncommon	Pop est.	1	20
		Summer	Winter

"A relatively new species in New Zealand, their distribution is increasing"

– New Zealand Birds Online

There is a large unexplained variation in summer / winter counts for this species. There are also no known breeding areas in the Estuary.

Dabchick

Endemic New Zealand Dabchick were recorded in the Estuary for the first time (but just once) during the 2018 winter low tide survey.

Dabchick were first recorded breeding in a an artificial lake at Stonefields in 2018

Banded rail

There is a rarely seen sustainable population of breeding Banded rail at Tahuna Torea Reserve. Chicks were seen by Rowena West in December 2018.

A Banded rail at Tahuna Torea in 2018. Photo by Rowena West.

How did shorebirds use the Estuary?

Historical data on shorebird use of the Tāmaki Estuary is patchy but paints a clear picture of decline.

"An approximately three-hour tidal difference and the narrow distances between the Manukau Harbour and the Waitemata and Tāmaki Estuary, also allow waders to extend their feeding times by easily moving between east and west coasts.

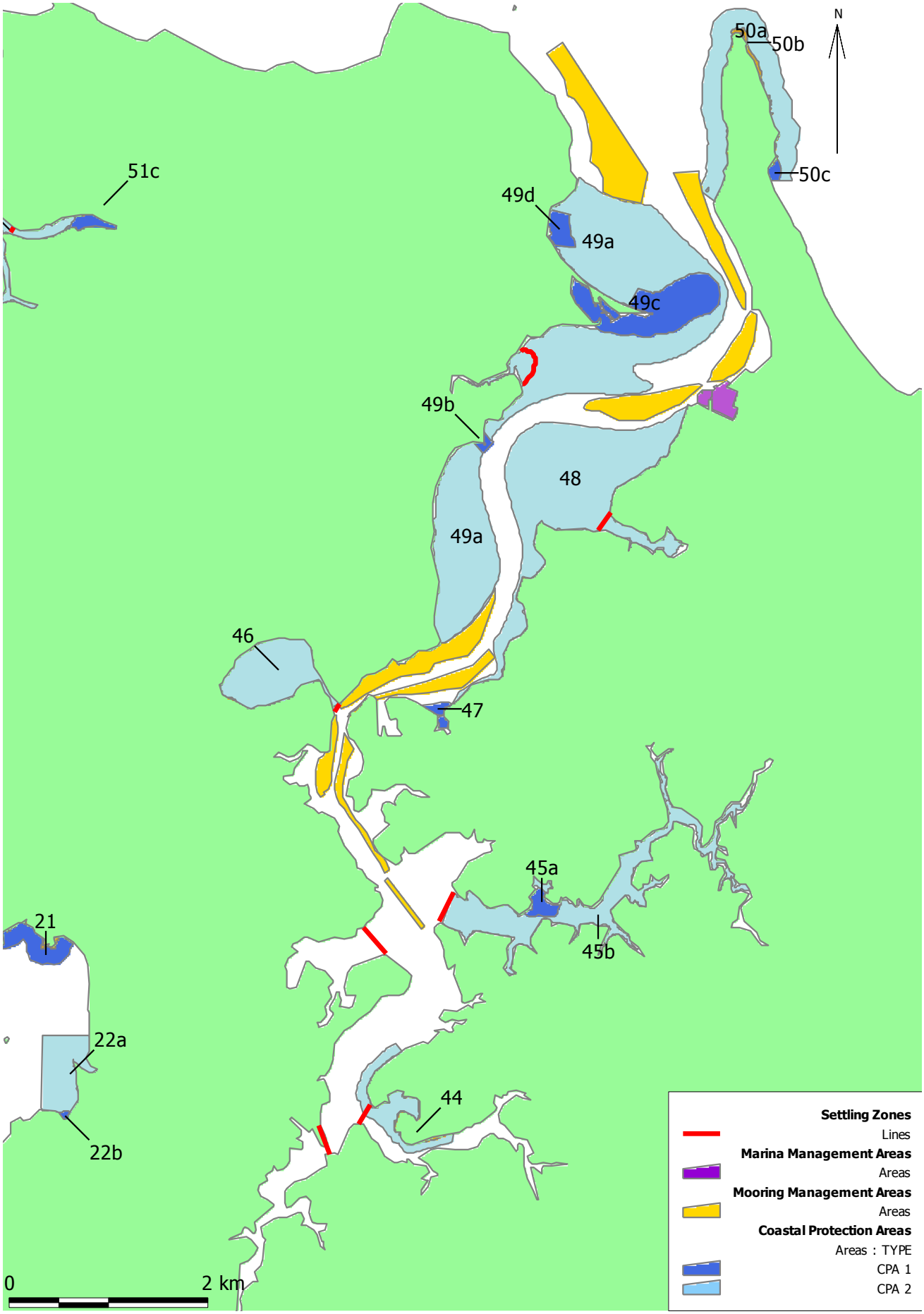
The Tāmaki is utilised by a range of New Zealand resident and migratory shore birds, with the mid-to-lower reaches being particularly important due to the availability of roosting and feeding areas. The value of these areas is recognised through the designation of coastal protection areas and areas of significant conservation value. The Atlas of Bird Distribution in New Zealand (Robertson et al. 2007) indicates that up to 31 coastal bird species frequent the Tāmaki and/or adjoining area. Of these, 11 species have been classified as threatened.

...

The most common waders are the pied oystercatcher in autumn and winter and godwit in summer. Together with pied stilts and knots, these can be seen seasonally on the coastal fringe and spit during high tide or feeding on the mudflats during low tide (Cameron et al. 1997). Hayward and Morley (2005) also list 15 species of bird observed during ecological surveys of Tāmaki Estuary, of which 13 could be considered coastal or wetland species. Bird diversity tended to be greater in the mid-to-outer estuary, but mallard duck, white-faced heron, reef heron, pied oystercatcher, kingfisher, black-backed gull and red-billed gull were recorded in the Otara Lake area. Dowding and Moore (2006) noted that the large upper Manukau flock of wrybill has an important feeding site in the upper Tāmaki River (which is often used by 1000 birds or more); and concluded that it is a critical site for the species, but since it is not a roost site it does not feature in the usual lists of important sites."

– Environmental Condition and Values of Mangere Inlet, Whau Estuary and Tāmaki Estuary. Auckland Regional Council 2008.

Let's look at what has been documented at various roosting sites.



Coastal protection areas (CPAs) and areas of significant conservation value (ASCV) in Tāmaki Estuary. The sediment and contaminant settling zones identified in the Auckland Regional Plan: Coastal are also shown.

– Environmental Condition and Values of Mangere Inlet, Whau Estuary and Tāmaki Estuary. Auckland Regional Council 2008 (Figure 3).

Pakuranga Creek Roost

Protection Type. Coastal Protection Area 1. CPA / ASCV No. 45a & b.

"Pakuranga Creek roost (45a) is one of the roosting sites used by some of the hundreds of wading birds that feed within the Tāmaki Estuary. The whole of the Tāmaki Estuary is a regionally important wildlife habitat and has been selected by the Department of Conservation as an Area of Significant Conservation Value (ASCV). This roost is associated with the values of Coastal Protection Areas 47, 48, and 49 and forms an integral part of the wildlife habitat values of the estuary."

– Environmental Condition and Values of Mangere Inlet, Whau Estuary and Tāmaki Estuary. Auckland Regional Council 2008.

"Shorebirds no longer found roosting at this site."

– Shaun Lee 2014.

Site 45b. Aerial photography via Auckland Council GeoMaps.

Pakuranga Creek roost. Site 45a. Aerial photography via Auckland Council GeoMaps.

Tāmaki River East Roost

Protection Type. Coastal Protection Area 1. CPA / ASCV No. 47.

"One of the roosting sites used by some of the hundreds of wading birds that feed within the Tāmaki Estuary. This roost is associated with the values of Coastal Protection Areas 45, 48, and 49."

– Environmental Condition and Values of Mangere Inlet, Whau Estuary and Tāmaki Estuary. Auckland Regional Council 2008.

"Shorebirds no longer found roosting at this site."

– Shaun Lee 2014.

Tāmaki River East Roost. Site 47. Aerial photography via Auckland Council GeoMaps.

Tahuna Torea

This is the best documented roost in the Estuary largely because of the efforts of Ronald Lockley (8 November 1903 – 12 April 2000) and the restoration efforts of the local Rangers including Chris Barfoot. It is the primary summer roost for South Island pied oystercatcher. The species composition has altered and abundance dropped by at least a factor of 10 since the 1970s.

Species found at Tahuna Torea:

- Banded dotterel
- Bar-tailed godwit
- Black-backed gull
- Caspian tern
- Gannet
- Grey duck
- Knot
- Little black shag
- Little shag
- Mallard
- Masked (spur-wing) plover
- New Zealand dotterel
- New Zealand kingfisher
- Paradise shelduck
- Pied oystercatcher
- Pied shag
- Pied stilt
- Pukeko
- Red-billed gull
- Reef heron
- Royal spoonbill
- Variable oystercatcher
- White-faced heron
- White-fronted tern
- Wrybill

– M. Taylor, Ornithological Society July 2007

The spit and lagoon at Tahuna Torea Reserve. Aerial photography via Auckland Council GeoMaps.

Notes from the House Above the Sea: by Ronald Lockley 1980

"But already we had seen large flocks of Arctic godwits and knots, and with them some indeterminate northern sandpipers among the native stilts and other waders feeding at the edge of the tide in the river below"

– Pg 8

"'Tahuna' means means a meeting place, and 'Torea' (pointing to a flock of oystercatchers resting on the beach close ahead) is the name of those black and white birds."

– Pg 11

"… along the Tahuna-Torea shore … we counted some 500 each of bar-tailed godwits and knots, most of them immatures lacking red in the breast plumage (they would spend our winter here, but adults had already flown north to summer in Siberia and Alaska); 1000 pied and a few black oystercatchers, about to live all winter here away from their breeding-grounds along the shingle rivers of the South Island; 2000 red-billed gulls at roost on the far point of the sandspit; 150 stilts; 40 grey duck and mallard; 25 Caspian terns; and a few black-backed gulls – all these ranged along the edge of the tide filling the muddy sandy lagoon."

– Pg 73

Note this was before the area was restored.

"The regiments of SIPO are sometimes a thousand strong."

– Pg 180

"A small number [of wyrbill] visit the Tāmaki, where they rest at high tide at the tip of our sandspit"

– Pg 181

"To this refuge [Godwit Island, Tahuna Torea, Tāmaki Estuary] now flock hundreds of godwits, knots, torea, stilts, terns, many whitefaced and some reef herons, kingfishers and other birds deposed from the sandspit by strolling humans at high tide. At times the pale mud of Kuaka Island is completely covered with waders. Birds soon learn where they are safe, even where parties of bird-watchers assemble to gape at them across the twenty meters of rippling tide. They are, anyway, full-fed and sleepy and it is too much trouble to move. 'Of course, ' said one pessimistic friend, 'all that heaped-up mud is bound to slump to its former level. Already it is eroding around the tide-line. What do you propose to do about that?' 'We, or our bird-loving posterity, will build it up again, of course!'"

– Pg 217-218

Knots haven't been seen since 2014 (250 Knots at Tahuna Torea spit Nov 2014 Heather Rogers and Rowena West) and Sandpiper are no longer seen in the Estuary. The constructed islands look to have largely eroded by 1996. Encroaching mangroves and weeds have further reduced their functionality as bird roosts. No shorebirds have been seen roosting on the islands for at least a decade (maybe two).

In his book *Tahuna Torea: Tip-site to Nature Reserve* Chris Barfoot documents the sentinel's watch song quoted by Tutewana of Ngati Paoa. Here is part of the English translation:

"Ah! A cormorant. A cormorant.
Ah! a crested cormorant alights
On Tahuna-Torea.
..."

The crested cormorant is likely a Spotted shag. There are no other records of spotted shags at Tahuna Torea.

Species	1970s by Ronald Lockley (casual walking)	2018 by Shaun Lee (extensive on boat)
Bar-tailed godwits	500	-
Knots	500	-
Pied stilts	150	19
South Island pied oystercatcher	1,000	160
Variable oystercatcher	A few (3)	9
Red-billed gulls	2,000	86
S black-backed gulls	A few (3)	92
Caspian terns	25	-
Grey duck and mallard	40	-
Banded dotterel	-	6
Northern New Zealand dotterel	-	3
White-faced heron	-	30
Royal spoonbill	-	4
Pied shag	-	1
TOTAL	4,221	410

– ***Fig 04.*** Winter* counts at Tahuna Torea

**Lockleys counts were probably done in Autumn. Recreating his exact count time and method would result in even less birds counted.*

"In the early 20th century, the Hauraki Gulf population [of spotted shags] may have numbered 10,000 ... about 900 birds remain in the Gulf."

– Tim Lovegrove 2017 (http://gulfjournal.org.nz/article/where-are-our-spotted-shags)

The Tahuna Torea spit ('the gathering place of the oystercatcher') has been modified to create a variety of freshwater and estuarine habitats. The estuarine area behind the spit has been dammed and developed by the Tāmaki Estuary Protection Society, as a brackish pond for feeding and roosting birds. A freshwater wetland has also been developed as a breeding and feeding area. The area provides an interesting complex of marine, intertidal, freshwater and terrestrial habitats for a wide range of birds. It has added value because of its proximity to, and ready access for, a large number of people. Birds which frequent the area include the South Island pied oystercatcher, variable oystercatcher, Caspian tern, grey teal, pied stilt, godwit, knot, turnstone, golden plover, banded dotterel, New Zealand dotterel, wrybill, black-backed gulls, red-billed gulls, caspian terns, pied shags and little shags; white-faced heron and blue reef heron also feed on thetidal flats.

– The Proposed Auckland Unitary Plan (notified 30 September 2013)

Knot, Grey teal, Turnstone, Golden plover and Reef heron were not observed in any of the 2017-19 counts. White-faced heron can now be regularly seen roosting in the mangroves at high tide.

Red-billed gull numbers were likely inflated by open rubbish dumps in Auckland.

Notes from the Tahuna Torea: Tip-site to Nature Reserve by Chris Barfoot

"[In 1971] We followed the rising tide up the river and reached the spit when [several hundred] godwits were just taking off from the lagoon mudflats and circling in the sky before landing on the little strip of sand left on the spit itself."

– Pg 31

"[24th April 1972] A banded rail ran out of the the mangroves – it was a great find . ...we noted 40 godwits, 30 grey ducks, stilts, 300 oyster catchers, 2000 red-billed gulls, several pheasants..."

– Pg 35

"Councilor Harry Dansley said in his column in the Auckland Star: Its bird-haunted. Pheasants crow in the thickets, pukeko wade in the marshy pools, oystercatchers throng the Sandspit, godwits in season hold migration conferences there and check their compasses and pied stilts wade through the shallows on dainty twin-thin legs."

– Pg 41

Illustration depicting eight species to be observed on the spit or in the lagoon:
"Banded dotterel, South Island Pied Oystercatcher, Caspian Tern, Banded Rail, Pied Stilt, Godwit, Turnstone, White-fronted Tern."

– Pg 48

"Valerie recalled that Dan Rawiri spotted a large bird near the Fish Dam. After looking at it in amazement, he began to weep. 'It's a Bittern isn't it?' Valerie said softly. He nodded."

– Pg 124

A photo depicting c300
"...oystercatchers on sandbank below Vista Crescent."
Oystercatcher no longer roost here.

– Pg 157

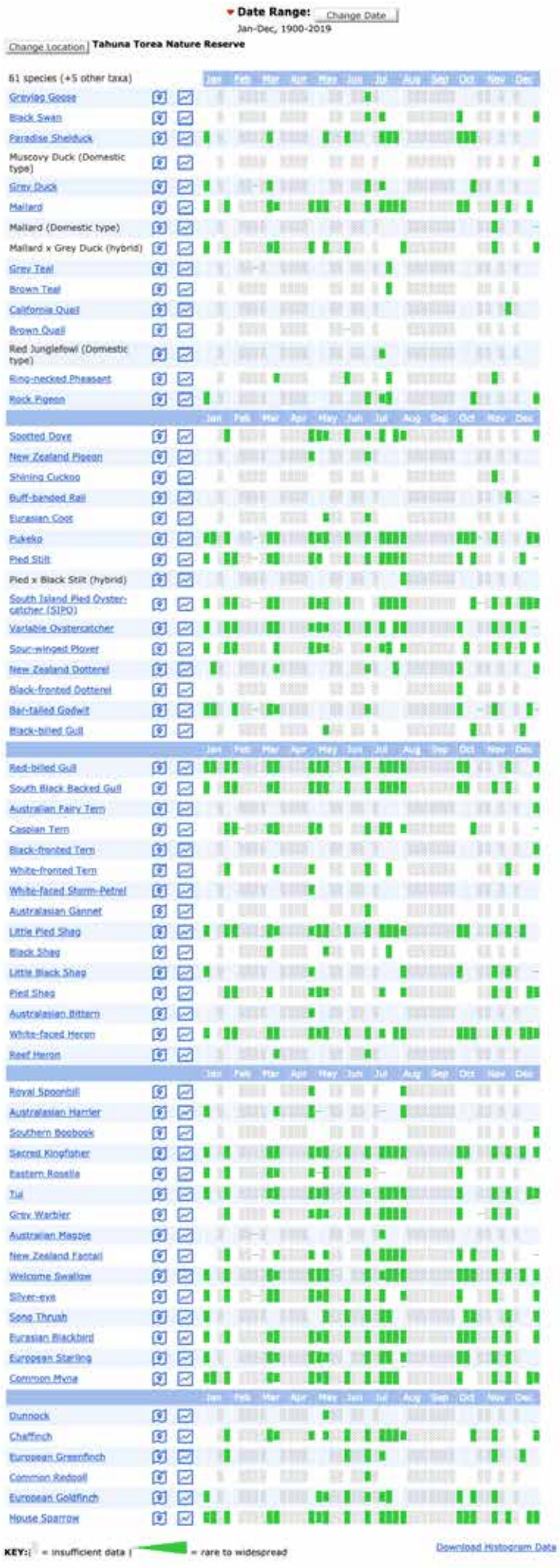
Two places were named after the Godwit who once roosted at Tahuna Torea, Godwit Lookout and Godwit Island.

"Where have all the godwits gone? Why have freshwater and bush birds increased but wading birds decreased? Is this a result of encroachment on feeding areas by mangroves, disturbance by dogs or the growth of the trees adjacent to feeding and roosting areas? Or is there another reason? Has the benthic or mudflat life which is the food resource for the birds been depleted by the depositing of silt from the huge subdivisions up river or by chemicals in stormwater, sewerage system overflows and other sources of pollution?"

– Pg 160

Dogs are no longer allowed on the spit however people so still sometimes walk their dogs there. Roosting birds are regularly disturbed by swimmers, walkers, joggers and kite-surfers.

24 Bar-tailed Godwit were last recorded roosting at Tahuna Torea Reserve in November 2014 by Heather Rogers and Rowena West.



As a designated Nature Reserve with a wide range of habitats Tahuna Torea Reserve is a birding hot-spot. Birders have recorded their observations at the site using eBird.

Banded dotterel and Turnstone do not appear despite being two of eight birds featured in a birding leaflet for the area in the 1970s. Banded dotterel present in Michael Taylors 2007 list just 10 years ago. The last record of a Banded dotterel at this site was at night on the 19th Feb 2017.

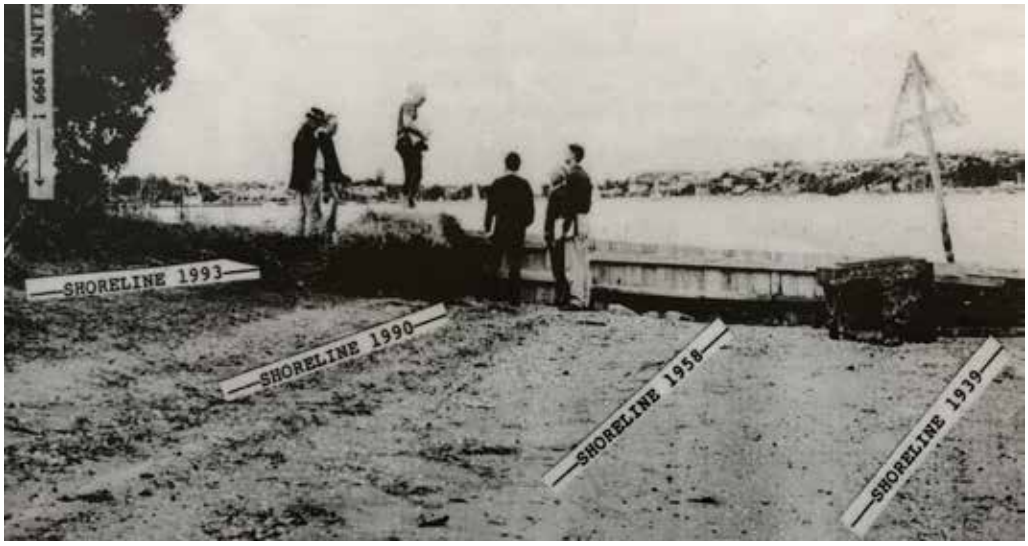
Shorebird roost	Shorebirds (excludes ducks, gulls, shags and pukeko)
Dunkirk Reserve	0
Pakuranga Sailing Club	0
Seaside Park	0
Robera Reserve	0
Karaka Bay	1
Sacred Heart	2
Saint Kentigen Colledge	4
Highbrook Drive	23
Point England Reserve	29
Mt Wellington War Memorial Reserve	79
Tahuna Torea Reserve	133

Fig 05. *Summer 2017/18 census numbers.*

Ronald Lockley and the new Godwit or Kuaka Island (photo: Valerie Insley).

– Tahuna Torea: Tip-site to Nature Reserve by Chris Barfoot.

The islands of Tahuna Torea Reserve in 2014



Tahuna Torea Reserve in 1993 showing 50 years of erosion (photo by Colin Percy).

– Tahuna Torea: Tip-site to Nature Reserve by Chris Barfoot.

Erosion is a major problem for the Tahuna Torea Reserve roost site. *"New Zealand tide records show an average rise in relative mean sea level of 1.7 mm per year over the 20th century."* (Ministry for the Environment 2019). *"Worst-case scenario is an average 2m sea-level rise by the end of the century. Best-case scenario, if we achieve the goals of the Paris climate agreement and keep temperature rise well below 2°C, is 50cm of sea-level rise."* (GNS climate scientist Tim Naish).

Bird roost compromised during a large tide. 04/02/2018.

Small roost available on a small tide.

As of 2018 there is no space available for shorebirds to roost during large tides or storm surges.

Shorebirds often chose to temporarily roost to the South West of the spit where there is less disturbance but it is covered by even the smallest tides, the shorebirds then have to fly somewhere else.

Gulls and South Island pied oystercatcher are less easily disturbed than other species like Royal spoonbill (pictured flying away) Shags and Bar-tailed godwit.

Dogs and a motorcycle at Tahuna Torea Spit, low tide 13 March 2019. Photos by Rowena West.

Tahuna Torea lagoon depth survey
Wed 20th June, HT 12:49 (Westhaven) 3.2M

A. >40cm 12:37pm. 1 little shag roosting
B. >40cm 12:40pm.
C. >40cm 12:41pm.
D. >40cm 12:42pm.
E. >40cm 12:44pm.
F. >40cm 12:45pm.
G. >40cm 12:46pm.
H. >40cm 12:46pm.
I. 30cm 12:47pm.
J. 40cm 12:47pm.
K. 25cm 12:49pm.
L. 40cm 12:50pm.
M. >50cm 12:50pm. 10 white-faced heron
N. 25cm 12:56pm.
O. 25cm 12:58pm.
P. 35cm 12:59pm.
Q. >1M 1:13pm. 11 pukeko, 2 little back shags, 1 pied shag, 13 mallard

The above survey by Shaun Lee tested the depth of the lagoon at Tahuna Torea Reserve to see if it was suitable for waders at high tide. Areas towards the center of the lagoon were not measured as he didn't want to get his shorts wet. The lagoon was found to be too deep at high tide to function as a roost.

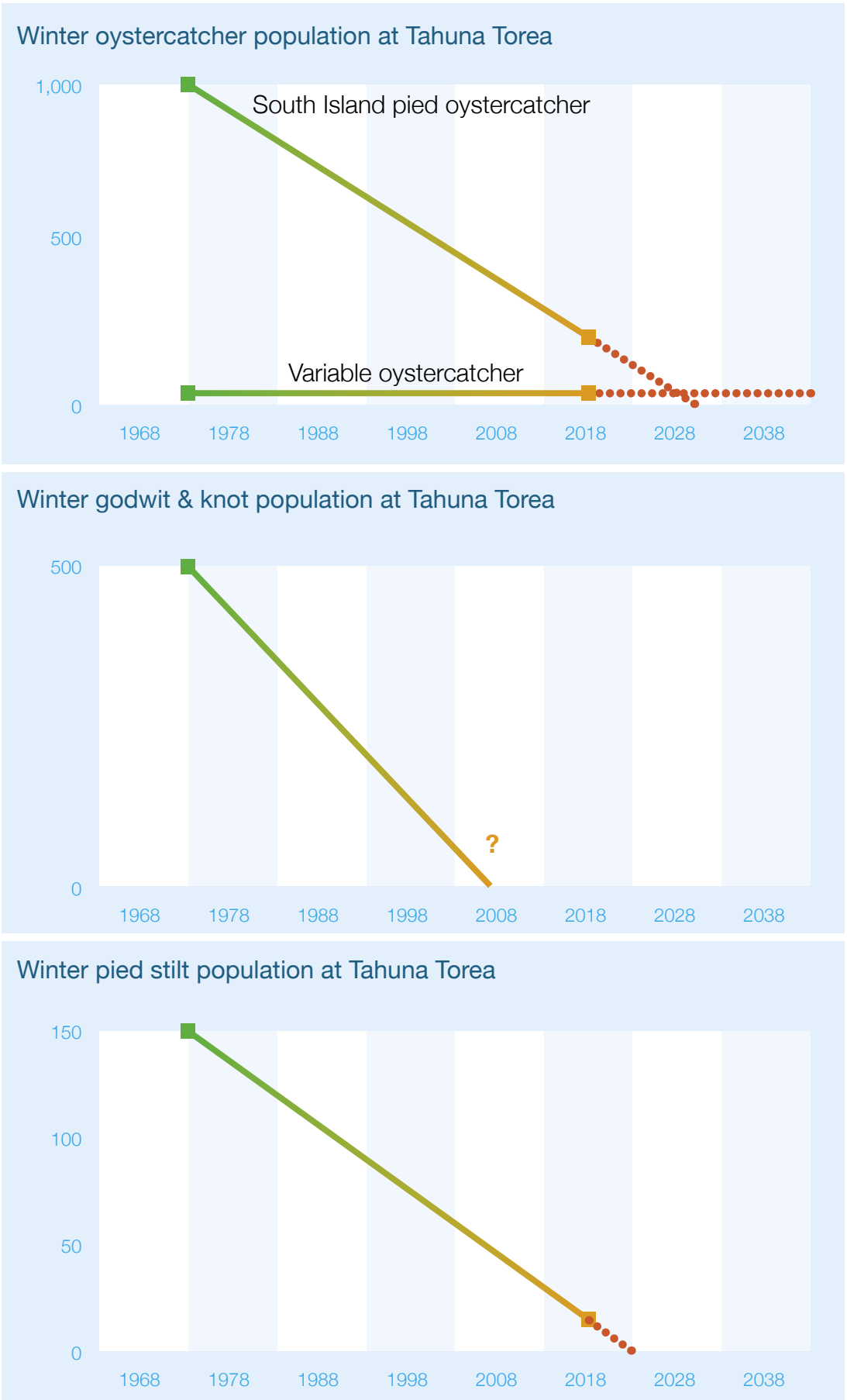


Fig 06. Shorebird population declines at Tahuna Torea Reserve since the 1970s.

- 1970s by Ronald Lockley (casual walking)
- 2018 by Shaun Lee (extensive on boat)
- Predicted population

Panmure Basin

The outlet to Panmure Basin is also notable for its large, pied shag colony. Little and black shags, white-faced herons, gulls and kingfishers also frequent that area.

– Environmental Condition and Values of Mangere Inlet, Whau Estuary and Tāmaki Estuary. Auckland Regional Council 2008.

The Pied shag colony has existed since at least the late 1960s. In 1997 the colony had 150 breeding pairs. The population dropped to five breeding pairs in 2017. The birds are currently fed and nursed by Corina Hooper at Pam Howletts Cormorant Sanctuary.

There is also a Red-billed gull colony under Panmure Bridge. It doesn't appear in any literature so may be a recent occurrence.

White-fronted terns also nest under the bridge.

All three colonies are threatened by the Panmure to Pakuranga stage of AMETI Eastern Busway.

Panmure Basin. Aerial photography via Auckland Council GeoMaps.

Point England Reserve

During the 20th century there is a noticeable absence of Northern New Zealand dotterel observations in the Tāmaki Estuary. Sylvia Reed led the banding of this species for several years and regularly counted birds at Tahuna Torea Reserve. No observations were found in her notes archived at the Auckland Museum.

This site was first documented as a shorebird roost by Shaun Lee in 2013 when he found breeding Northern New Zealand dotterel in the paddock.

Eight dotterel regularly nest here with low productivity. The primary threat is chick and egg predation by Pukeko. However mowers were not able to hit prescribed targets and the 2018-19 season produced no eggs. Managing grass length for shorebirds is a major issue for this site.

The post breeding dotterel flock has been recorded irregularly here as have Banded dotterel and Shore plover.

In winter Point England Reserve is the primary roost site for the shorebirds of the Tāmaki Estuary. The dominant species are endemic South Island Pied Oystercatcher who regularly number in the hundreds and also feed in the paddock.

Godwit have only ever once been seen using the site. The site has never been modified for shorebird

Point England Reserve. Aerial photography via Auckland Council GeoMaps.

Shorebird roost	Shorebirds (excludes ducks, gulls, shags and pukeko)
Dunkirk Reserve	0
Pakuranga Sailing Club	0
Seaside Park	0
Karaka Bay	7
Saint Kentigen Colledge	7
Robera Reserve	10
Wai O Taki Bay	20
Weir	30
Highbrook Drive	55
Sacred Heart	75
Mt Wellington War Memorial Reserve	138
Tahuna Torea Reserve	363
Point England Reserve	478

Fig 07. *Winter 2018 census numbers*

use. However dogs are not allowed in the paddock and Council support a trapping program that runs throughout the dotterel breeding season.

The site is currently threatened by a development, even if the development is scaled back it will introduce cats which will predate the endangered shorebirds. The ecological value of the site is well documented in several submissions opposing the Point England Development Enabling Bill 2016.

Mount Wellington War Memorial Reserve

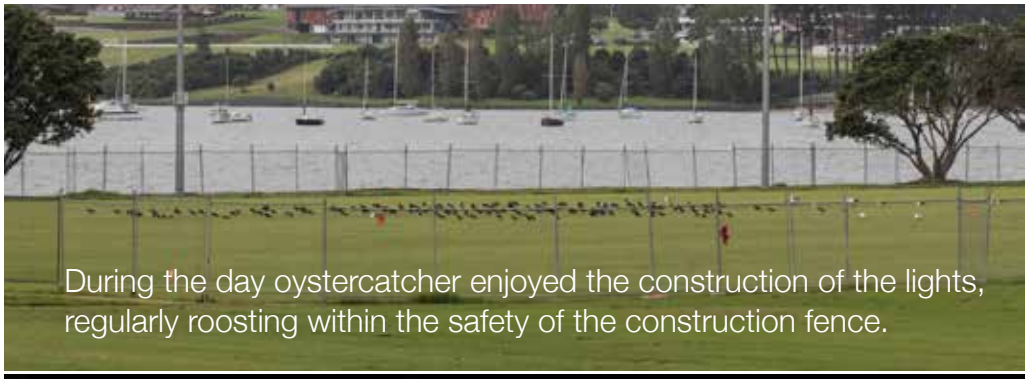
It is unknown how long this site has used by shorebirds. The regular high tide observations of Banded dotterel using this site at night in March 2017 inspired the night count survey.

87 South Island pied oystercatcher at Mount Wellington War Memorial Reserve 31/05/18.

Mount Wellington War Memorial Reserve. Aerial photography via Auckland Council GeoMaps.

During the census the Mt Wellington War Memorial Reserve went from being the third most important night roosting site to having no birds at all. The birds seem to have stopped using the site at night after these lights were installed.

Endangered birds seen regularly in 2017



During the day oystercatcher enjoyed the construction of the lights, regularly roosting within the safety of the construction fence.

No birds May 2018

Shaun Lee told the Local Board about the potential roosting loss due to increased recreational activity at their business meeting on Tuesday 28th November 2017.

Pakuranga Sailing Club

Day counts at this site revealed no shorebirds except one morning on the 28th of July 2018 when 3 South Island Pied oystercatcher, 7 Variable oystercatcher, 59 Pied stilt, 2 Caspian tern, 2 Black backed gulls, and 23 Red-billed gulls were observed. This count was done as a follow up on a surprising night count the previous day which revealed 1 Spur-winged plover, 3 Northern New Zealand dotterel, 1 Banded dotterel, 3 Wrybill, 39 Pied stilt and two Red-billed gull. Locals report seeing dotterel roost here but it is also an busy dog walking site.

Night vision photo of a Banded dotterel at the Pakuranga Sailing club in July 2018.

Pakuranga Sailing Club. Aerial photography via Auckland Council GeoMaps.

Feeding Areas

The table on ***page 56*** records various feeding areas for shorebirds in 2005. However the numbers are consistently low indicating a different counting technique, perhaps by eye.

One observation by renowned ornithologists records a large flock of Wrybill.

"Upper Tāmaki River. Wrybill 800–1000 May 2002 ACR / JED."

– Dowding and Moore (2006)

Further remarks on the observation are worth noting.

"... the large upper-Manukau Harbour wrybill flock regularly crosses the Auckland isthmus to feed in the upper reaches of the Tāmaki River; this is a very important site for this species, which does not appear on the roost-site list. Clearly, high-water roost counts may not identify all the important non-breeding sites for a taxon."

– Dowding and Moore (2006)

The highest Wrybill count in the study was 116 indicating a possible drop of 684 birds over 12 years or 57 birds per annum.

"When on the Tāmaki Estuary they [waders] do not feed but instead loaf for the duration of the Manukau Harbour high tide period and then return to the Manukau Harbour (T.G. Lovegrove, pers. comm., C.R. Veitch, pers. obs.); however, birds which fly to the Waitemata Harbour have been observed to feed there (A.C. Riegen, pers. comm.)."

– C.R. (DICK) VEITCH' & A.M. (TONY) HABRAKEN. Waders of the Manukau Harbour and Firth of Thames

This 'loafing' behaviour is no longer observed.

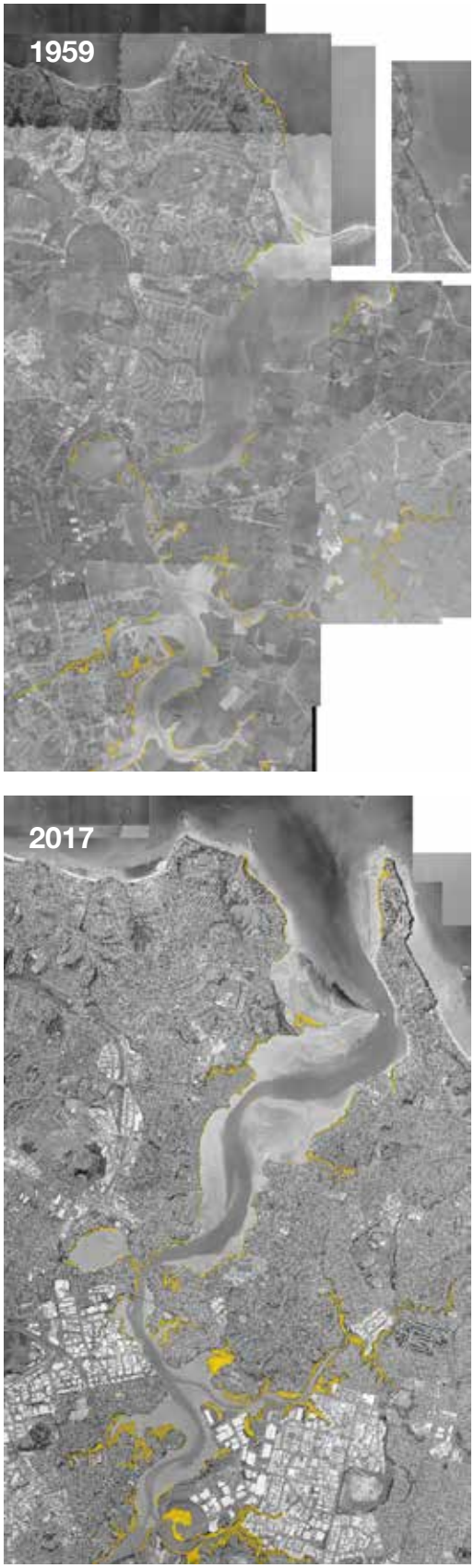


Fig 08. *Coastal vegetation change. Aerial photography via Auckland Council GeoMaps.*

	Wrybill	Mallard duck	White-faced Heron	Rock pigeon	Reef heron	SI Pied Oystercatcher	Kingfisher	Pied stilt	Caspian tern	Godwit	Black-backed Gull	Red-billed gull	Pied shag	Pukeko	Starling
St Heliers to West Tāmaki Head (inc Achilles Pt)						o					r				
West Tāmaki Head															
Musick Point to Eastern Beach						o	r						o		
Karaka Bay to Tahuna Torea					L	L	L	L			r		L		
Bucklands Beach to Musick Point					r	o	r				o	c	r		
Tahuna Torea Reserve to Point England Reserve (inc Waihuna Bay)				r		f	r			f				r	
Point England Reserve to Panmure Bridge					o	o		o		o	o				
Panmure Bridge to Half Moon Bay (inc Farm Cove)	o		o		r	o	r	o	o	o	o	c	o	o	
Panmure Basin							o	o	r		o	c	o		o
Pakuranga Creek to Panmure Bridge		c													
Panmure Basin to Otahuhu Creek (inc Panama Rd Peninsula)					o		o				o	o	o	o	
Otara Lake, Waiouru Peninsula and Pakuranga Creek															
Otahuhu Creek up to Middlemore		o	r		r	r	r				o	o			r

a = abundant (c.>10,000 live specimens)
c = common (c.50-10,000 live specimens)
f = frequent (c.6-50 live specimens)
o = occasional (3-5 live specimens)
r = rare (1-2 live specimens)

L = published historic records in Larcombe (1973)

– Species List. Intertidal Life of the Tāmaki Estuary and its Entrance, Auckland Hayward, B. W; Morley, M.S (2005). Prepared for Auckland Regional Council.

This is the only Estuary wide survey of birds discovered. The low tide bird counts (above) used a different method (the biologists may not have used binoculars), the low numbers of South Island Pied Oystercatcher or Godwit (depending on the time of year) are out of step with the rest of this study.

Advice from New Zealand's shorebird experts

"Unlike the Manukau and Waitemata Harbours, the Tāmaki Estuary has very few high tide roosts for shorebirds. The carrying capacity of intertidal areas for shorebirds is linked to the proximity of good high tide roosts. If roosts are degraded or lost, the numbers of shorebirds using the adjacent intertidal feeding areas may decline."

– Dr Tim Lovegrove (2016)

"A study on the Tagus estuary in Portugal, an important site for Dunlin, looked at bird densities in relation to roost proximity. It found the overall density of birds on suitable mudflat foraging grounds declined with the distance to the nearest roost. … If suitable roosts are lost or degraded, and alternative sites are too far away from feeding areas, the overall carrying capacity of the site will decrease. Why? It is all to do with energy budgets. A shorebird needs energy to meet its daily maintenance needs, and the further it needs to fly to find a suitable high tide roost, the higher its energy expenditure."

– Keith Woodley, Miranda Naturalists' Trust News Issue 85

"Each development proposal, seen in isolation, may seem insignificant: certainly the applicant is keen to play down any environmental effects as 'negligible' or 'minimal'. But seen from the perspective of a shorebird population, each small development, each section of foraging area or roost site reduced or removed, each load of dredge tailings – all chip away at habitat. Given the pressures for such developments seem to be continuous, the net outcome is that shorebirds continue to lose out."

– Keith Woodley, Shorebirds of New Zealand. Pg 233

"Studies in Britain, the Netherlands and in the United States have all linked declines in shorebird populations to disturbance."

– Keith Woodley, Miranda Naturalists' Trust News Issue 85

Species	Threatened or at risk of extinction	Endemic	Breeding in the Estuary	Conservation dependant	Critical to ecology*	Overseas management effort
Red-billed gull	Y		Y		Y	
S black-backed gull						
Caspian tern	Y					
White-fronted tern	Y		Y			
Banded rail	Y		Y			
Pukeko			Y			
Paradise shelduck		Y	Y			
Mallard duck			Y			
White-faced heron			Y			
Spur-winged plover			Y			
Pied stilt			Y			
Royal Spoonbill	Y					
SI pied oystercatcher	Y	Y			Y	
Variable oystercatcher	Y	Y	Y			
Northern NZ dotterel	Y	Y	Y	Y		
Banded dotterel	Y	Y			Y	
Wrybill	Y	Y			Y	
Shore plover	Y	Y		Y		
Bar-tailed godwit	Y				Y	Y
Pied shag	Y		Y		Y	
Little shag			Y			
Little black shag	Y					

Fig 09. Species categorised by logical values to help prioritise management decisions. Species with three or more values highlighted.

* Critical to ecology is based on high numbers (>100) in the historical record.

Recommendations

As expected many species (Pukeko, Spur-winged plover, Mallards) that prefer to feed in grassy areas were recorded in higher numbers at high tide roosts than the low tide counts. These species are not threatened with extinction and breed in sports fields and parks surrounding the Estuary. No management action is recommended for these species.

Biodiversity is important to maintaining a healthy estuary. That means maintaining a healthy number and range of birds with different bill sizes. Auckland Council grade the Estuary on a range from A-F and it currently scores a E for biodiversity. The Estuary was home to 15 introduced marine invertebrate species *Hayward and Morley (2005)* in 2005, since then at least one more unwanted organism has been introduced (Mediterranean fan worm). Biosecurity New Zealand are not managing introduced species in the Estuary, that job is left up to the shorebirds. Further reductions to shorebird numbers might create further trophic cascades forever changing the nature of the Estuary. Because of its proximity to Ports of Auckland the Tāmaki Estuary is a transit lounge for invasive species.

Increasing the abundance and diversity of shorebirds will help with the Estuaries biodiversity grade.

Three species (Ruddy turnstone & Golden plover and Lesser Knots) haven't been seen in the Estuary for decades. We know Lesser knots were once a dominant species in the Estuary performing and important ecological function, they are now functionally extinct meaning that the service they performed in the ecosystem no longer exists.

Steep declines have been recorded for migratory wading birds, gulls and shags. Functional extinction for most of these species is predicted in the coming decades.

Recently self introduced birds like White-faced heron and Spur-winged plover have different feeding abilities so can not replace Knots or other shorebirds that are declining, they also don't exist in numbers that compare to the original flocks.

The local board should aid any ecological project with a lot of public support. However its most logical to focus on species that are endemic (found nowhere else), breeding in the Estuary,

conservation dependent (will go extinct without help) or critical to ecological functions of the Estuary. Additionally if New Zealand is critical of how a migratory species is treated overseas we should hold ourselves to the same standard. If we apply that filter to the species found in the Estuary priority should go to Red-billed gull, South Island pied oystercatcher, Variable oystercatcher, Northern New Zealand dotterel, Banded dotterel Wrybill, Shore plover, Bar-tailed godwit and Pied shag. ***See Fig 09.***

Something must be done to reverse the decline of the shag colony at Panmure. The scale of problem warrants its own study.

Although they fit the priority list the Red-billed gull population in the Estuary is inflated by the presence of humans so it is the authors opinion that there is no need to grow the population in the Estuary.

The large scale of bird loss compared to the small growth of vegetation rules mangrove encroachment in feeding areas out as a cause of declining bird numbers. See ***Fig 08.*** Chemical and sediment pollution is a likely contributing factor, repeating Auckland Regional Councils study *Intertidal Life of the Tāmaki Estuary and its Entrance (Hayward, B. W; Morley, M.S 2005)* would confirm any negative trends with regard to food for shorebirds.

Disturbance is a major problem for shorebirds roosting around the Estuary. They often have to move due to walkers, joggers, cyclists, kite surfers, drones and remote control airplanes, dog walkers etc.

Degradation and just complete loss of roosting areas is the most likely cause for declining shorebird numbers.

Two[1] out of three historical roosts have been lost. One[2] roost was partially lost during this study another[3] has been recently threatened with development. Of the two largest remaining roosts one[4] is threatened with development and the other sea level rise[5]. None of the roosts are protected from human disturbance.

The most immediate threats to roosts are in the Maungakiekie-Tāmaki Local Board area. The Tāmaki Open Space Network Plan makes no provisions for shorebirds and compromises existing roosts.

When thinking about management recommendations we should be inspired by the Tāmaki Regeneration Programme which is the largest urban transformation project in New Zealand, promising a thriving, attractive, **sustainable** and self-reliant community where the future looks brighter for residents of Glen Innes, Panmure and Point England. The project lies alongside the Estuary and its vision is estimated to cost around $1.9 billion over 20 years (NBR 2012). The earthworks have been going for years movings thousands of tones of dirt. The parallel vision of the Open Space Network Plan is not nearly as ambitious. There is scope for multiple bird roosts which

[1]Pakuranga Creek Roost & Tāmaki River East 1940 Roost. [2]Mount Wellington War Memorial Reserve. [3]Panmure shag and Red-billed gull colonies. [4]Point England Reserve. [5]Tahuna Torea Reserve.

Bar-tailed godwit.

would aid in both the retention & return of shorebirds (targeting six of the eight priority species identified) and the restoration of an unhealthy Estuary.

Additional to vegetation clearance we could build seawalls at Tahuna Torea Reserve either South West of the spit or rebuild the islands built by one man and a digger in the mid 1970s. We would be committing future generations to maintaining them which could be really expensive if not done right. There are many good examples we can learn from.

If we are optimistic and imagine Point England Reserve is saved from development we should give it higher status so that it's more protected from future developments. The Northern New Zealand dotterel breeding areas alone should qualify it as a Significant Ecological Zone. If we modified the habitat to make it more suitable for Bar-tailed godwit, Point England Reserve could tick all the boxes as safe roosting place for all the wading birds in the Tāmaki Estuary. This option would be a lot cheaper than seawalls but there is no guarantee that Godwit would use the roost.

All over New Zealand communities are not just maintaining their existing bird populations but growing them under the collective dream of Predator Free 2050. Community driven predator control programmes bordering the Estuary are now running at Tahuna Torea, Wai O Taiki Bay, and Point England. Regular beach cleanups are being run by Seacleaners, Sustainable coastlines, various schools, the Tāmaki Estuary Environmental Forum and Conservation Volunteers. The community wants a healthy Estuary full of birds, but without roosting space numbers will continue to decline and we will see more local extinctions.

Please do the right thing and create safe spaces for our shorebirds to roost and breed.

The next step is to have this report reviewed by a shorebird expert who can recommend methods for roost protection and enhancement.

Appendix

Artificial and enhanced roosts

Artificial roost in Anderson's Bay, Otago New Zealand. Created 2009. Photo by Kirsten Hutton.

Anderson's Bay

Resource consent from the Otago Regional Council. Cost was capped at $80,000. Funding was provided by Otago Community Trust, the Dunedin City Council's biodiversity fund, the Greenwood Trust and engineering firm, MWH New Zealand Ltd.

Enhanced Roost in Ambury Park, Auckland, New Zealand. Created 1998-2005. Photo by Anna Loren.

Ambury Park

Developed by Watercare Services Limited.

One of five enhanced shell banks, Shoal Bay, Auckland, NZ. Created 2003. Photo NZTA.

Shoal Bay

Developed as part of the Northern busway by Fletcher Construction and Transit New Zealand. Cost of $200,000 included a Shorebird Technical Working Group.

Artificial Roost in Snettisham Nature Reserve, England. Created 1998-2005. Photo by FLPA / Alamy Stock Photo.

Snettisham Nature Reserve

Bar-tailed godwits roosting on the bank of an aquaculture pond, Yalujiang National Nature Reserve, Liaoning Province. Photo D. S. Melville.

Yalujiang National Nature Reserve

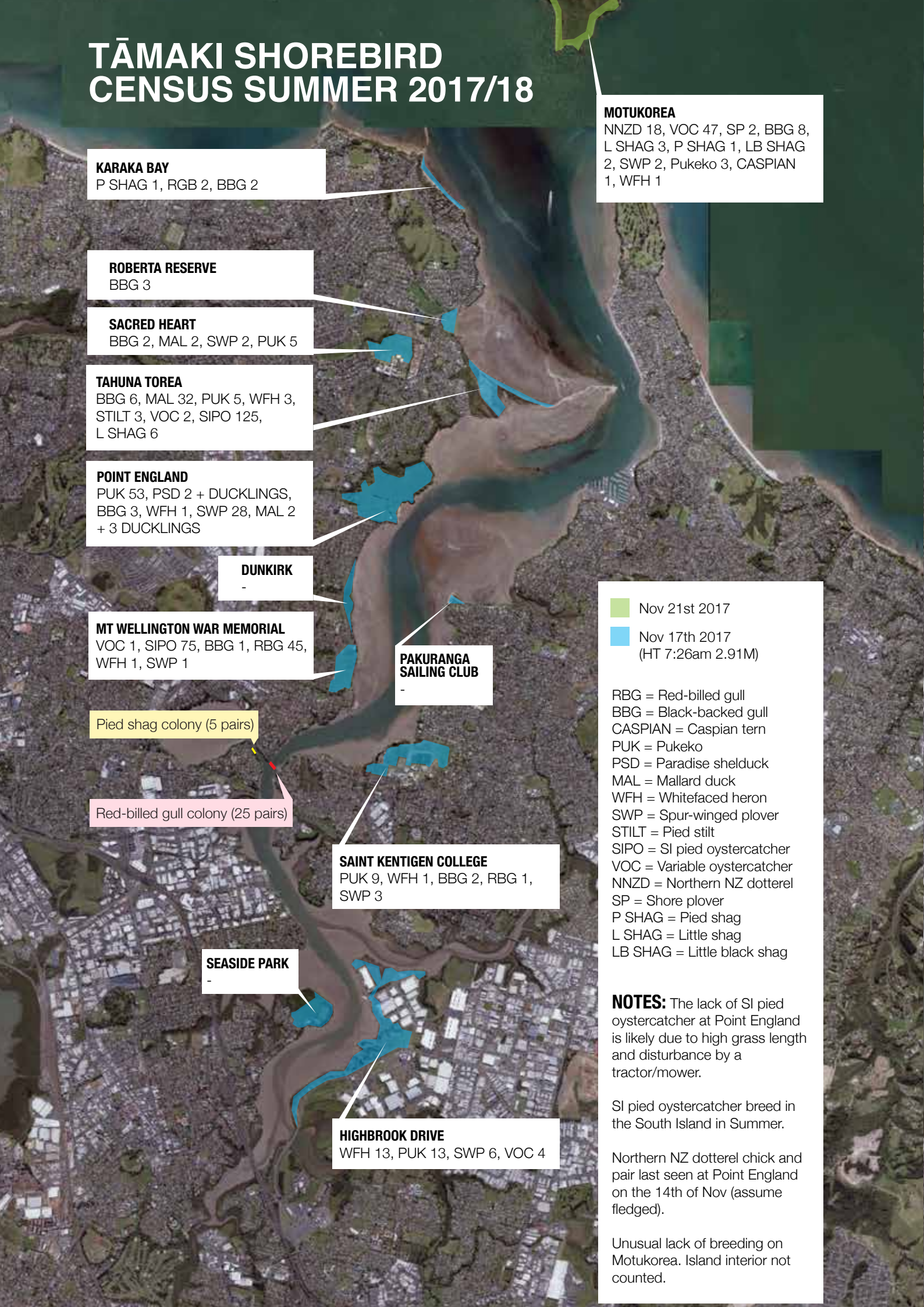
This situation is far from ideal but it is better than what we have in the Tāmaki Estaury with no Bar-tailed godwit roosts.

Lesser Flamingo colony on the artificial island in Kamfers Dam, South Africa. Photo by Mark Anderson

Kamfers Dam

In 2006 BirdLife South Africa paired up with a local mining company to build an S-shaped island for nesting Lesser flamingos when the dam got too high. They even set up tiny turrets to mimic the mud mounds flamingos typically lay their eggs on.

TĀMAKI SHOREBIRD CENSUS SUMMER 2017/18



Nov 21st 2017

Nov 17th 2017
(HT 7:26am 2.91M)

RBG = Red-billed gull
BBG = Black-backed gull
CASPIAN = Caspian tern
PUK = Pukeko
PSD = Paradise shelduck
MAL = Mallard duck
WFH = Whitefaced heron
SWP = Spur-winged plover
STILT = Pied stilt
SIPO = SI pied oystercatcher
VOC = Variable oystercatcher
NNZD = Northern NZ dotterel
SP = Shore plover
P SHAG = Pied shag
L SHAG = Little shag
LB SHAG = Little black shag

NOTES: The lack of SI pied oystercatcher at Point England is likely due to high grass length and disturbance by a tractor/mower.

SI pied oystercatcher breed in the South Island in Summer.

Northern NZ dotterel chick and pair last seen at Point England on the 14th of Nov (assume fledged).

Unusual lack of breeding on Motukorea. Island interior not counted.

TĀMAKI SHOREBIRD CENSUS WINTER 2018

MOTUKOREA
L SHAG 3, LB SHAG 7, P SHAG 9, PUK 4, VOC 2, NNZD 8, SP 1, CASPIAN 2

KARAKA BAY
4 RGB, 3 BBG

ROBERTA RESERVE
VOC 3, PSD 2, P SHAG 2, L SHAG 3

SACRED HEART
SIPO 32, BBG 40, SWP 3

TAHUNA TOREA
SIPO 300, CASPIAN 3, BBG 4, RBG 23, WFH 4, MAL 24, L SHAG 4, LB SHAG 1

WAI O TAIKI BAY
P SHAG 2, L SHAG 1, LB SHAG 2, RBG 15

POINT ENGLAND
BBG 3, WFH 2, PUK 23, RBG 51, SIPO 257, STILT 106, VOC 9, NNZD 6, WFH 14, SWP 7

DUNKIRK
-

MT WELLINGTON WAR MEMORIAL
CASPIAN 1, SWP 1, BBG 18, SIPO 32, RBG 86

PAKURANGA SAILING CLUB
-

Pied shag colonies
P SHAG 25, L B SHAG 2, WFH 2

Red-billed gull colony
RBG 57

SAINT KENTIGEN COLLEGE
MAL 2, P SHAG 1, WFH 1, SWP 2, BBG 1

SEASIDE PARK
-

HIGHBROOK DRIVE
P SHAG 1, LB SHAG 1, PSD 2, MAL 9 + 13 DUCKLINGS, BBG 2, STILT 11, SWP 14, PUK 1, WFH 1

WEIR
LB SHAGS 13, P SHAG 16, WFH 1

June 19th 2018

June 17th 2018
(HT 9:58am 3.33M)

RBG = Red-billed gull
BBG = Black-backed gull
CASPIAN = Caspian tern
PUK = Pukeko
PSD = Paradise shelduck
MAL = Mallard duck
WFH = Whitefaced heron
SWP = Spur-winged plover
STILT = Pied stilt
SIPO = SI pied oystercatcher
VOC = Variable oystercatcher
NNZD = Northern NZ dotterel
SP = Shore plover
P SHAG = Pied shag
L SHAG = Little shag
LB SHAG = Little black shag

NOTES: Red-billed gull collony not active this time of year.

Pied shags had at least two active nests.

37 red-billed gulls were on rugby club roof at Mt Wellington and all were on a roof in Wai O Taiki Bay.

50+ banded dotterel seen feeding North of Seaside park on June 13. Roosting location unknown.

TĀMAKI SHOREBIRD CENSUS
LOW TIDE WINTER 2018

KARAKA BAY 11:10AM
BBG 3, RBG 3, WFH 2, VOC 4

TAHUNA TOREA NORTH 11:15AM
BD 6, BBG 73, RBG 26, STILT 9, NNZD 1, SIPO 22, VOC 3, WFH 23

TAHUNA TOREA SOUTH 12:00PM
RBG 60, BBG 19, STILT 10, VOC 6, SPOONBILL 4, WFH 7, SIPO 138, NNZD 2, P SHAG 1

DUNKIRK 12:30PM
RBG 158, BBG 2, STILT 33, SIPO 6

SANDBANK12:40PM
SIPO 60, VOC 2, P SHAG 1, BBG 45, RBG 8, STILT 2, WFH 1

PANMURE LAGOON 1:00PM
LB SHAG 1, P SHAG 15, WFH 3, STILT 23, BBG 24, RBG 74

PAKURANGA SOUTH 1:10
P SHAG 15, MAL 13, BBG 2, LB SHAG 1, L SHAG 1, WFH 9, WFT 1, STILT 1, SIPO 34, RBG 13

HIGHBROOK 1:30
SIPO 30, NNZD 10, WFH 17, LB SHAG 9, BBG 40, BD 18, WRY 114, L SHAG 1, P SHAG 15, CASPIAN 2, MAL 2, WFT 2, STILT 24

PAKURANGA NORTH 12:40
SIPO 19 , STILT 5, WFH 3, WFT 1, BBG 10, CASPIAN 1, RBG 14, P SHAG 1, HARRIER 1

EAST TAMAKI 1:20
SIPO 10, CASPIAN 3, BBG 6 STILT 3, LB SHAG 1, WFH 5 P SHAG 1, DAB 1

BUCKLANDS BEACH 11:30AM
BBG 15, RBG 40, LB SHAG 2, SIPO 16, STILTS 2, VOC 11, L SHAG 1

HALF MOON BAY 12:20PM
LB SHAG 1, SWP 1, RBG 188 BBG 3, WFH 2, VOC 2, PS 3 STILT 12, BD 4, SIPO 71, NNZD 11, L SHAG 3, WRY 2

July 12th 2018
(LT 12:10pm)

RBG = Red-billed gull
BBG = Black-backed gull
CASPIAN = Caspian tern
PUK = Pukeko
PSD = Paradise shelduck
MAL = Mallard duck
DAB = New Zealand Dabchick
WFH = Whitefaced heron
SPOONBILL = Royal Spoonbill
SWP = Spur-winged plover
STILT = Pied stilt
SIPO = SI pied oystercatcher
VOC = Variable oystercatcher
NNZD = Northern NZ dotterel
BD = Banded dotterel
WRY = Wrybill
P SHAG = Pied shag
L SHAG = Little shag
LB SHAG = Little black shag
HARRIER = Swamp harrier

NOTES: Survey via boat. Format followed HT count method but (1hr either side of LT) however we went 20mins overtime to cover the area. Birds flying and swimming were counted. Birds that passed the boat were deducted from the next site.

RBG colony empty. Many shags on poles and boats. Highbrook wrybill flock included banded and NZ dotterel.

TĀMAKI SHOREBIRD CENSUS
LOW TIDE SUMMER 2018/19

KARAKA BAY 10:30AM
BBG 2, RBG 4, VOC 4

TAHUNA TOREA NORTH 10:40AM
BBG 114, RBG 15, L SHAG 4, STILT 10, SWP 1, SIPO 35, VOC 4, WFH 38, CASPIAN 1, BTG 23

TAHUNA TOREA SOUTH 11:10AM
P SHAG 8, SIPO 37, BBG 44, WFH 32, VOC 5, RBG 26, BTG 90, CASPIAN 2

DUNKIRK 11:40AM
SIPO 28, RBG 126, BBG 14, SWP 2, VOC 1

SANDBANK12:15PM
BBG 10, LB SHAG 1

PANMURE LAGOON 12:35PM
RBG 61, WFH 11, VOC 1, BBG 26, L SHAG 1, P SHAG 2, MAL 14, WFT 1

Pied shag colony (11+1 chicks)

Red-billed gull colony (34+6 chicks) 6 WFT + 2 WFT chicks. 4 more RBG chicks with 6 adults on a boat.

PAKURANGA SOUTH 12:40PM
WFT 10 (+1 on nest), RBG 55, P SHAG 7, SIPO 23, BBG 10, MAL 15, VOC 2, WFH 3

HIGHBROOK 12:50PM
SIPO 26, P SHAG 2, WFH 4, WFT 2, BBG 36, RBG 121, STILT 11

HIGHBROOK SOUTH 1:04PM
RBG 200(ISH), BBG 5

BUCKLANDS BEACH 11:00AM
CASPIAN 2, RBG 4, SIPO 29, VOC 9, BBG 2, WFT 2

HALF MOON BAY 11:45AM
BBG 18, BTG 49, SIPO 56, RBG 15, VOC 3, NNZD 1, WFH 11, P SHAG 1

PAKURANGA NORTH 12:30PM
MAL 7

EAST TAMAKI 12:45PM
SPOONBILL 2, BBG 33, RBG 3, SIPO 55, WFH 2

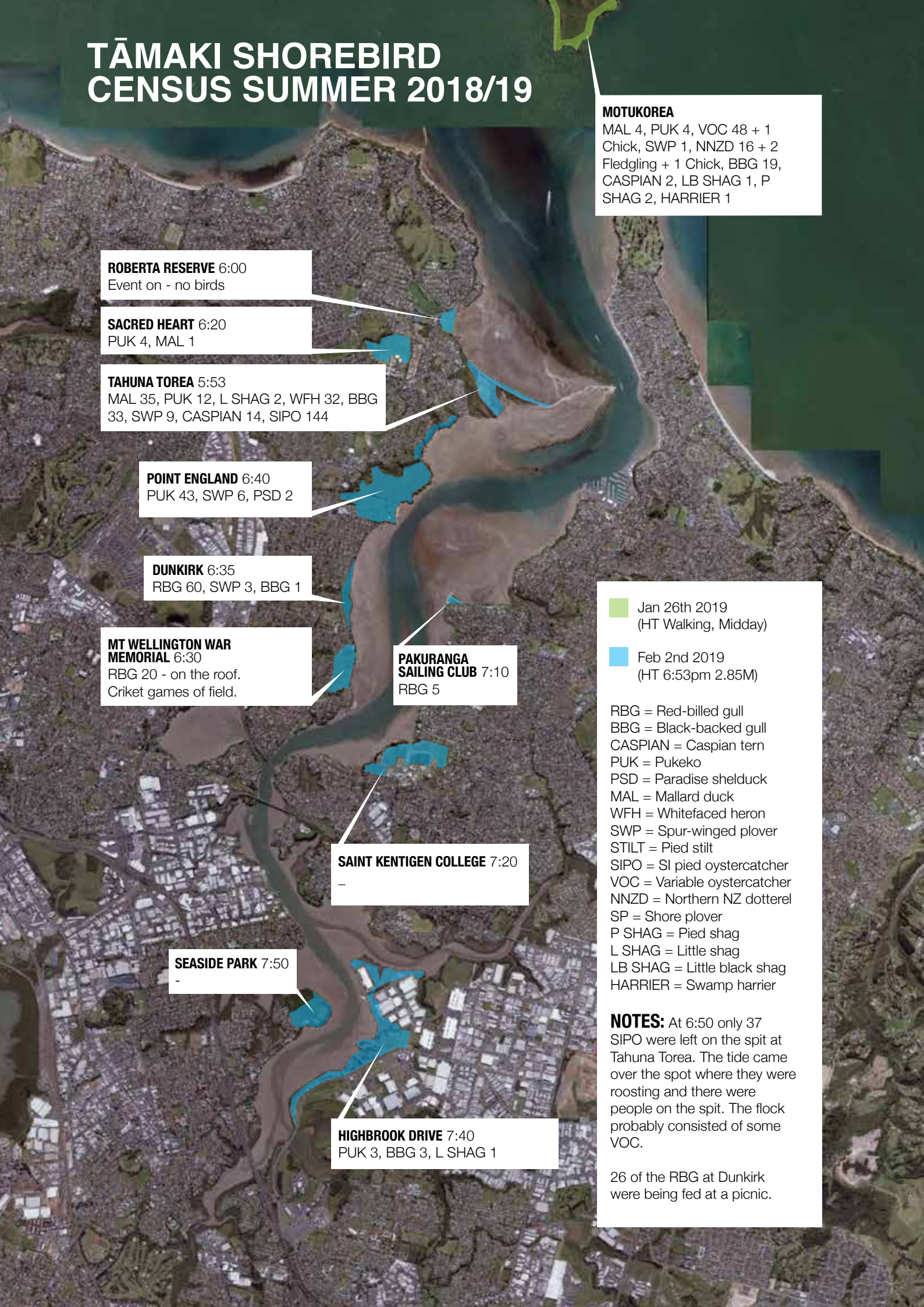
Feburary 1st 2019
(LT 11:44am)

RBG = Red-billed gull
BBG = Black-backed gull
CASPIAN = Caspian tern
PUK = Pukeko
PSD = Paradise shelduck
MAL = Mallard duck
DAB = New Zealand Dabchick
WFH = Whitefaced heron
SPOONBILL = Royal Spoonbill
SWP = Spur-winged plover
STILT = Pied stilt
SIPO = SI pied oystercatcher
VOC = Variable oystercatcher
NNZD = Northern NZ dotterel
BD = Banded dotterel
WRY = Wrybill
BTG = Bar-tailed godwit
P SHAG = Pied shag
L SHAG = Little shag
LB SHAG = Little black shag
HARRIER = Swamp harrier

NOTES: Survey via boat. Format followed HT count method but (1hr either side of LT) however we went 20mins overtime to cover the area. Birds flying and swimming were counted. Birds that passed the boat were deducted from the next site.

Counting by Kathryn leGrove

TĀMAKI SHOREBIRD CENSUS SUMMER 2018/19



MOTUKOREA
MAL 4, PUK 4, VOC 48 + 1 Chick, SWP 1, NNZD 16 + 2 Fledgling + 1 Chick, BBG 19, CASPIAN 2, LB SHAG 1, P SHAG 2, HARRIER 1

ROBERTA RESERVE 6:00
Event on - no birds

SACRED HEART 6:20
PUK 4, MAL 1

TAHUNA TOREA 5:53
MAL 35, PUK 12, L SHAG 2, WFH 32, BBG 33, SWP 9, CASPIAN 14, SIPO 144

POINT ENGLAND 6:40
PUK 43, SWP 6, PSD 2

DUNKIRK 6:35
RBG 60, SWP 3, BBG 1

MT WELLINGTON WAR MEMORIAL 6:30
RBG 20 - on the roof.
Criket games of field.

PAKURANGA SAILING CLUB 7:10
RBG 5

SAINT KENTIGEN COLLEGE 7:20
–

SEASIDE PARK 7:50
-

HIGHBROOK DRIVE 7:40
PUK 3, BBG 3, L SHAG 1

Jan 26th 2019
(HT Walking, Midday)

Feb 2nd 2019
(HT 6:53pm 2.85M)

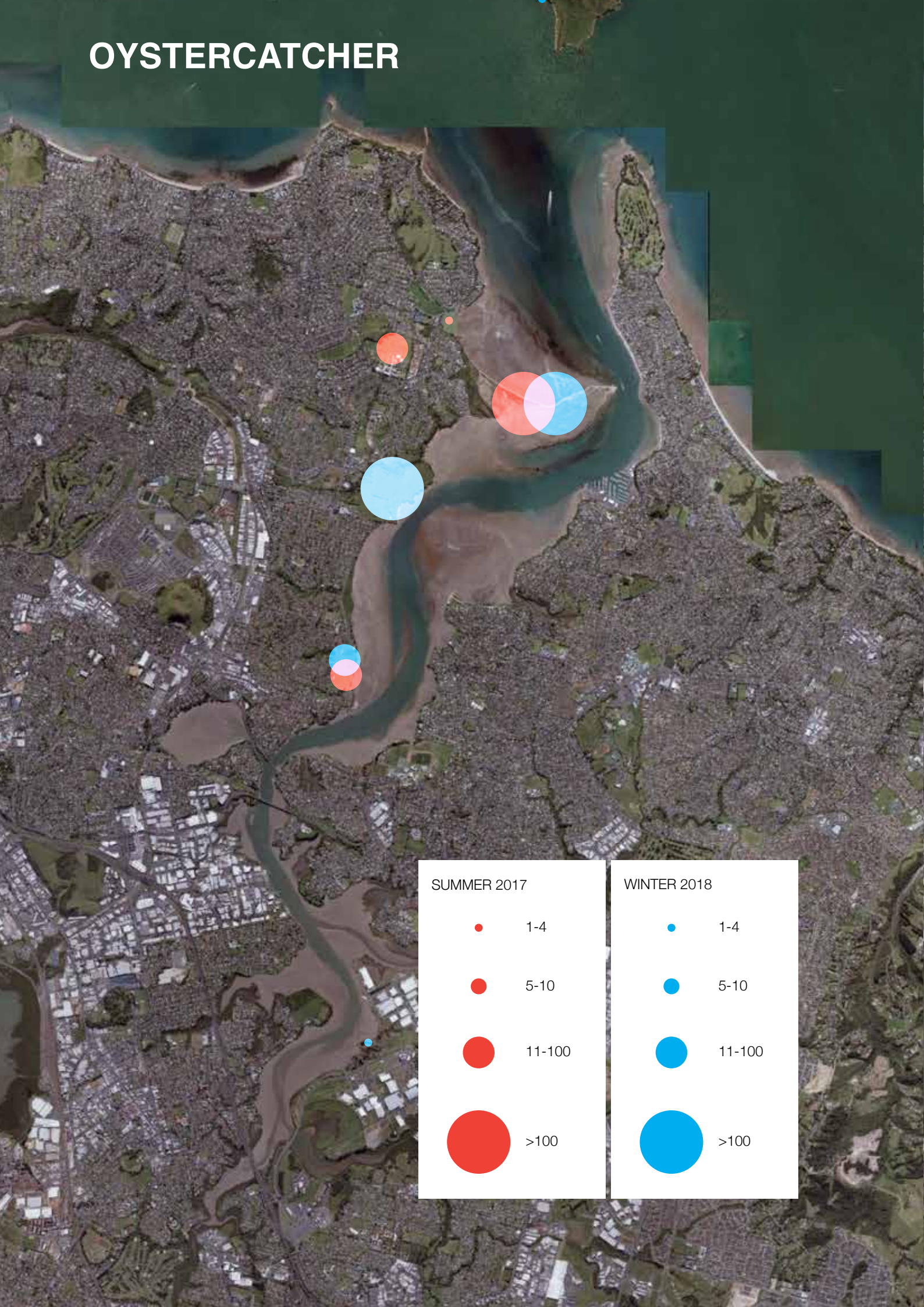
RBG = Red-billed gull
BBG = Black-backed gull
CASPIAN = Caspian tern
PUK = Pukeko
PSD = Paradise shelduck
MAL = Mallard duck
WFH = Whitefaced heron
SWP = Spur-winged plover
STILT = Pied stilt
SIPO = SI pied oystercatcher
VOC = Variable oystercatcher
NNZD = Northern NZ dotterel
SP = Shore plover
P SHAG = Pied shag
L SHAG = Little shag
LB SHAG = Little black shag
HARRIER = Swamp harrier

NOTES: At 6:50 only 37 SIPO were left on the spit at Tahuna Torea. The tide came over the spot where they were roosting and there were people on the spit. The flock probably consisted of some VOC.

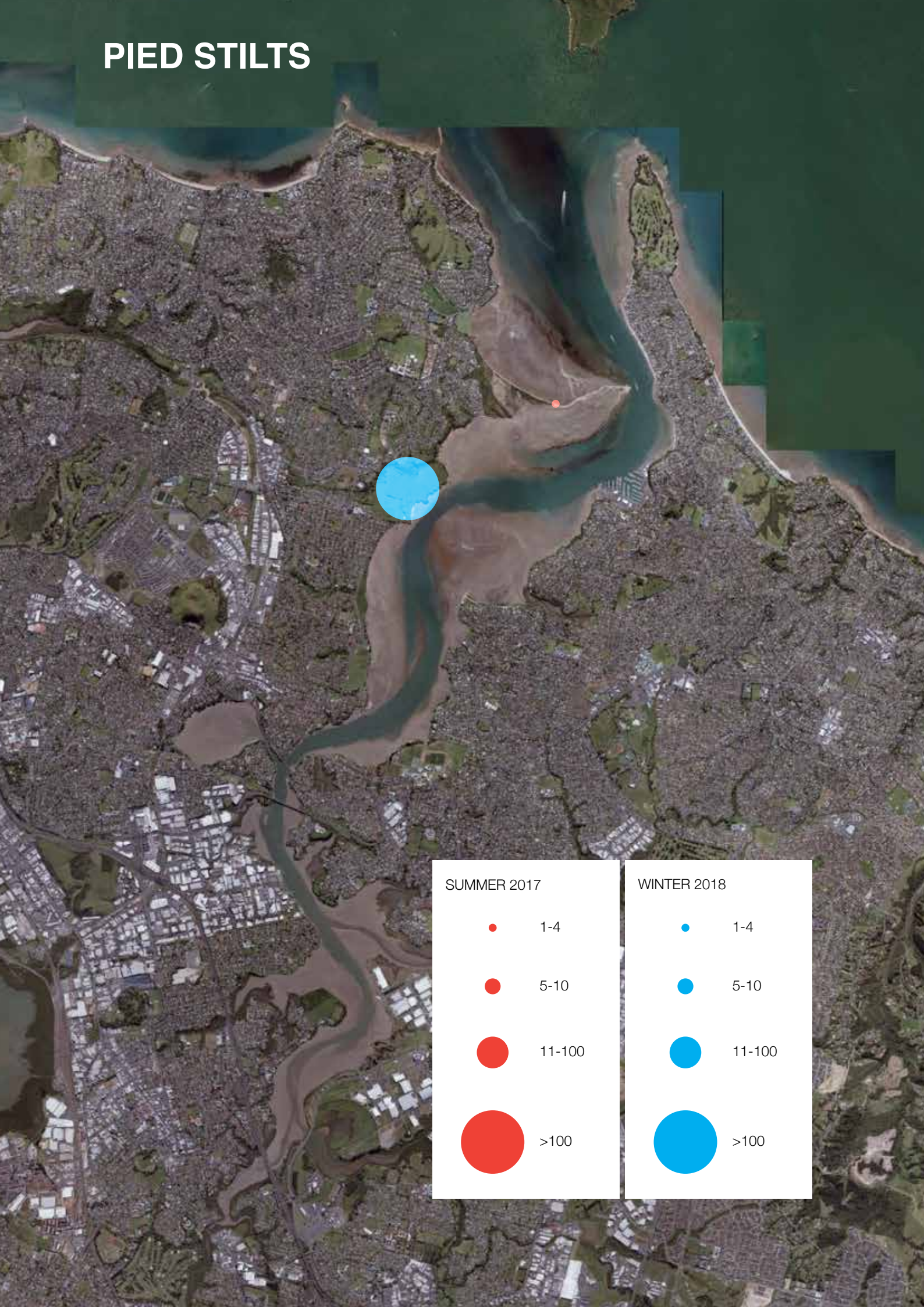
26 of the RBG at Dunkirk were being fed at a picnic.

TĀMAKI SHOREBIRD CENSUS NIGHT WINTER 2018

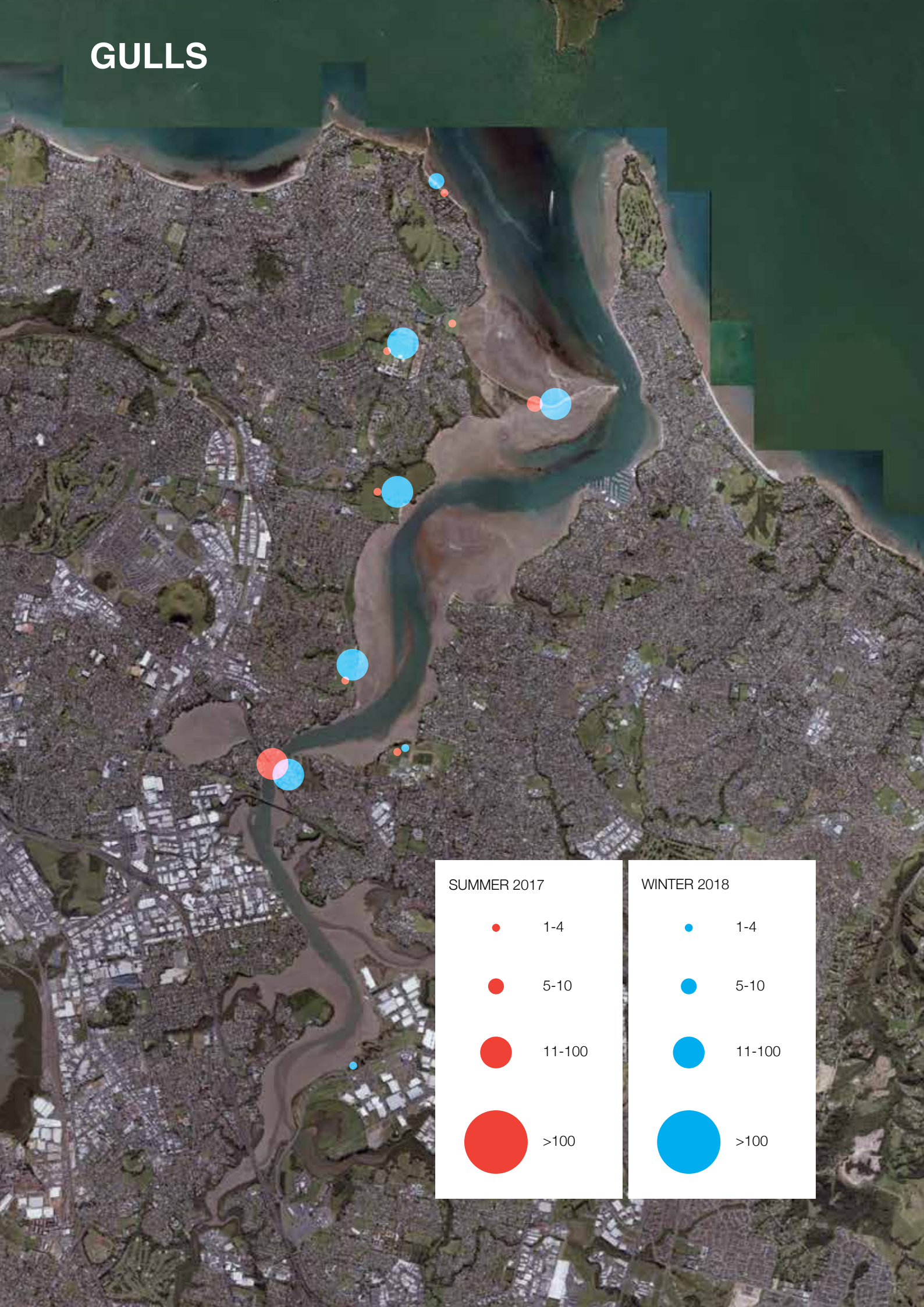
OYSTERCATCHER



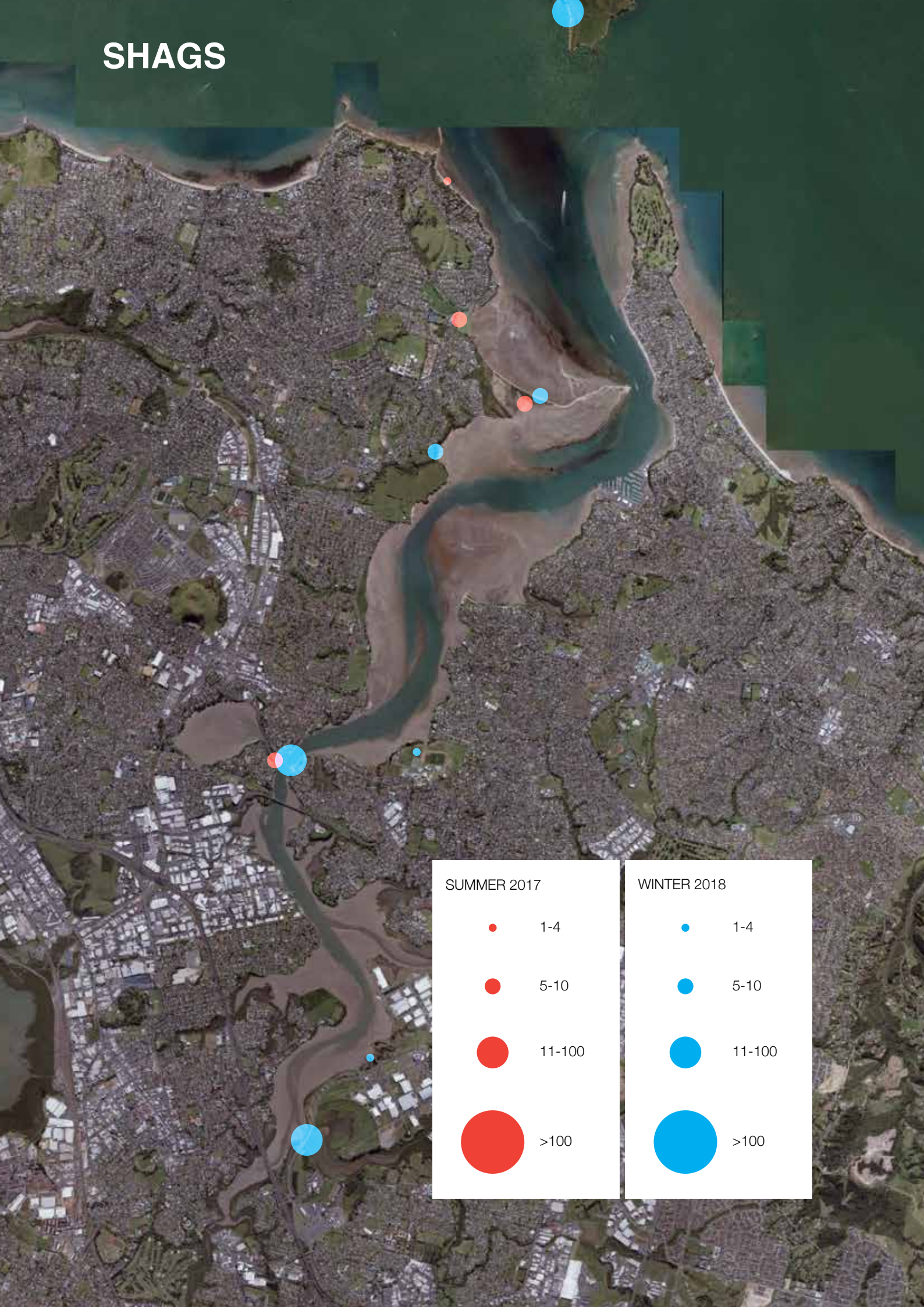
PIED STILTS



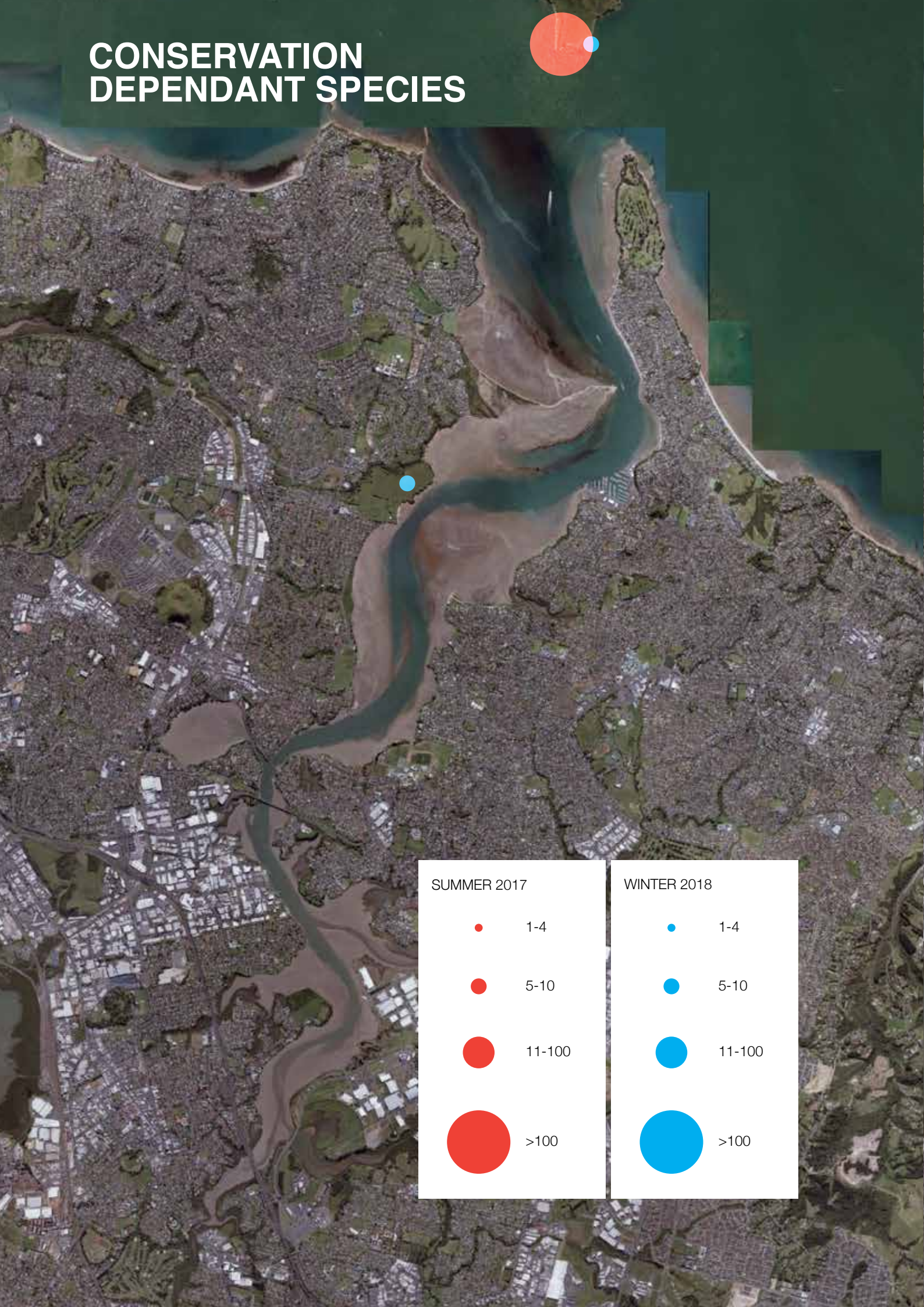
GULLS



SHAGS



CONSERVATION DEPENDANT SPECIES



KNOWN BREEDING AREAS 2017/18

Date	High Tide	Tide height (M)	Site Time	Site	SI pied oystercatcher	Variable oystercatcher	Spur-winged plover	Shore plover	Northern NZ dotterel	Banded dotterel	Wrybill	Pied stilt	Caspian tern	Paradise shelduck	Mallard	Black backed gull	Red billed gull	White faced heron	Pukeko	Royal spoonbill	Little black shag	Little shag	Pied shag	Weather Conditions	Notes
28 July 2018	07:42	3.1	07:40	Pakuranga Sailing Club	3	7						59	2			2	23							Clear, sun had just some up	SIPO flew to Point England. Definitly no small waders. Could easily have not seen the 20 missing pied stilts the night before. All birds below HT line - see photo.
30 May 2018	07:48	3.1	07:45	Mt Wellington Reserve	90																			Frost, clear skies	30+ SIPO in the air, 60+ SIPO at Southern end near water
30 May 2018	07:48	3.1	07:30	Pt England paddocks					6															Frost, clear skies	
30 May 2018	07:48	3.1	07:30	Pt England sportsfields	152		2							2		2								Frost, clear skies	SIPO Far western end. Flew South when disturbed by dog walker. 34 stayed.
30 May 2018	07:48	3.1	08:20	Tahuna Torea lagoon										2				10						Frost, clear skies	
30 May 2018	07:48	3.1	08:30	Tahuna Torea spit	86								1			3								Frost, clear skies	SIPO Flock seemed to arrive with me
29 July 2018	08:23	3.1	07:30	Roberta Reserve		11	1								2									Clear skies	9 SIPO and 7 BBG flying west. VOC flew in from East and were feeding. SE of reserve on the way to the spitwere 2 stilts, 2 malard, one little black shag, and four SIPO flying North.
29 July 2018	08:23	3.1	08:30	Sacred Heart Sportfeilds	10										2	20			9					Clear skies	Gulls and SIPO flew North-East when four more black-backed gulls flew in from the South, one calling. The four BBG's stayed.
29 July 2018	08:23	3.1	07:40	Tahuna Torea Lagoon											4									Clear skies	No white-faced heron in mangroves. Little back shag and 2 shellduck flying towards Point England.
29 July 2018	08:23	3.1	07:50	Tahuna Torea Spit	11	3						31				1	8			8		1		Clear skies	2 black-backed gulls flying North. No footprints indicating no one had been out before me,
31 May 2018	08:32	3.1	08:00	Mt Wellington Reserve	87		12									2	25							Frost, clear skies	SIPO at Southern end near water, RBG in the air
31 May 2018	08:32	3.1	07:50	Pt England paddocks														1	9					Frost, clear skies	
31 May 2018	08:32	3.1	07:45	Pt England sportsfields	52									2		8	2							Frost, clear skies	7 SIPO mid field, 45 SIPO flew in to western end of field, 35 SIPO flew in and landed on artificial rock on beach (rare to see them there but might be used more with long grass in paddocks).
31 May 2018	08:32	3.1	08:10	Roberta Reserve												1	8							Frost, clear skies	Gulls on the water
31 May 2018	08:32	3.1	08:20	Tahuna Torea lagoon														27						Frost, clear skies	
31 May 2018	08:32	3.1	08:30	Tahuna Torea spit	164							3	1			8								Frost, clear skies	
30 July 2018	09:03	3	09:25	Pakuranga Sailing Club													2							Clear skies	1 BBG flying West. 3 shipping containers added to carpark. Dog walkers
30 July 2018	09:03	3	09:05	Saint Kentigern Sportsfeilds			2									2								Clear skies	1 roooster! 1 mallard flying west. Did not go looking for SWP chick
30 July 2018	09:03	3	08:30	Seaside Park																				Clear skies	No shorebirds. Just two dog walkers
31 July 2018	09:40	3	09:00	Dunkirk Reserve			1										6							Overcast	7 black-backed gulls on water. Construction fence and new pathway has compromised this site
31 July 2018	09:40	3	08:50	Mt Wellington Reserve			2									12		1						Overcast	
31 July 2018	09:40	3	09:15	Pt England Beach	36	6											1							Overcast	Access to beach blocked by pathway construction
31 July 2018	09:40	3	09:30	Pt England Paddocks	140	1	4		11			63		2	3			20	12					Overcast	WFH feeding, 60% of SIPO feeding. 50 or so SIPO flew in from South-West. Spur-winged plover may have moved from sportsfeilds. Half of dotterel observed paired in mown teritories, moving around paddock after that. VOC sleeping away from flock. 1 caspian tern flying North.
31 July 2018	09:40	3	09:10	Pt England Sportsfields			9							1		9			2					Overcast	Dog on feild, 1 red-billed gull flying North
1 August 2018	10:18	3	10:00	Highbrook Drive			9		1			16			2	4		15	6		2	1	15	Overcast	10 or so pied stilts seen from motorway (not included). On weir (included) 11 pied shag, 2 little-black shag and 2 black-backed gulls. No shag nests at night roost spot. 3 spur-winged plover were chicks in two different families. DOC and landowner informed about NNZD. 2 black-backed gulls and 1 pied shag seen flying North. 16 pied stilts, 2 black-backed gulls and 2 pied shags on pier/ boat ramp.
1 August 2018	10:18	3	11:00	Highbrook Park			2																	Overcast	Large model aeroplanes flying at model airclub.
26 July 2018	18:46	3	17:45	Roberta Reserve		6																		Full moon, clear skies	VOC feeding on grass, still some light
26 July 2018	18:46	3	19:10	Sacred Heart sportfeilds			2								6				4					Full moon, clear skies	
26 July 2018	18:46	3	18:15	Tahuna Torea lagoon								9		4				1						Full moon, clear skies	2 stilts may have been on Lockley Island, people at lagoon with torches as we approached
26 July 2018	18:46	3	18:15	Tahuna Torea spit	38											3				8				Full moon, clear skies	Spoonbill were feeding at roost site then 8 flew west and east, people leaving spit as we approached
27 July 2018	19:29	3.1	19:20	Pakuranga Sailing Club			1		3	1	3	39					2							Full moon, clear skies	Able to get very close (6M away!). Only saw wrybill when car lights came on - they flew a tiny bit, sparrow sized! Not confident of ID one blurry photo shows them half the gheight of an NNZD. Only one of the NNZD seemed to have any breeding plumage. All birds below HT line.
27 July 2018	19:29	3.1	19:00	Saint Kentigern sportsfeilds	3		3									2								Full moon, clear skies	SIPO flying North minutes apart, one of the SWP was a two week old chick. Large net hazzard for birds flying at night.
27 July 2018	19:29	3.1	18:45	Seaside Park	49											1			4					Brief shower	SIPO feeding
29 May 2018	19:36	3.1	19:45	Mt Wellington Reserve																				Full moon, clear skies	No birds, people on field illuminated by lights
29 May 2018	19:36	3.1	19:25	Pt England paddocks								20		2					2					Full moon, clear skies	Pukeko could be SIPO
29 May 2018	19:36	3.1	19:00	Pt England sportsfields	65		2																	Full moon, clear skies	
29 May 2018	19:36	3.1	20:10	Tahuna Torea lagoon								60												Full moon, clear skies	
29 May 2018	19:36	3.1	20:30	Tahuna Torea spit	115		1									15	14							Full moon, clear skies	Mixed flock at end of spit, many birds behind spit (unseen)
28 July 2018	20:09	3.1	21:00	Dunkirk Reserve																				Full moon, clear skies	Nothing
28 July 2018	20:09	3.1	20:30	Mt Wellington Reserve			2							2	2									Full moon, clear skies	All at western end, lights were off when we arrived
28 July 2018	20:09	3.1	19:25	Pt England beach	63																			Full moon, clear skies	50 SIPO on artificial rock 13 on beach
28 July 2018	20:09	3.1	19:55	Pt England paddocks	8		3		2					2	5				5	8				Full moon, clear skies	Not sure about SIPO ID, could not check other NNZD nesting spots without disturbing SIPO
28 July 2018	20:09	3.1	19:15	Pt England sportsfields	92										4									Full moon, clear skies	Half of birds in two neat rows then spread out feeding
30 May 2018	20:19	3.1	19:45	Mt Wellington Reserve																				Full moon, clear skies	No birds, people on field illuminated by lights
30 May 2018	20:19	3.1	19:30	Pt England paddocks								16		1					4					Full moon, clear skies	
30 May 2018	20:19	3.1	19:20	Pt England sportsfields	55																			Full moon, clear skies	
30 May 2018	20:19	3.1	19:55	Roberta Reserve																				Full moon, clear skies	Entered via Riddell Rd to check Roberta
30 May 2018	20:19	3.1	20:05	Tahuna Torea lagoon	1							13												Full moon, clear skies	At least 1 SIPO heard but not seen
30 May 2018	20:19	3.1	20:15	Tahuna Torea spit	155											5								Full moon, clear skies	
29 July 2018	20:48	3.1	20:00	Highbrook Drive			3								3			3					2	Full moon, clear skies	2 hedgehogs, 7 hares, people on peir/boat ramp
29 July 2018	20:48	3.1	21:10	Highbrook Park			7								2									Full moon, clear skies	3 of the spur-winged plover were chicks. 14+ hares

Day / Night Count data

Bucklands Beach Peninsula, Musick Point and Tāmaki River Survey

– by Noel Knight. 20/06/2018

Start 09.30

1. Looking north from the end of Eastern Beach. Tide up to cliff face nothing seen.
2. Jern Pl Football grounds Eastern Beach nothing seen
3. Howick Golf Club car park looking South. Beach below car park, 8 VOC. On Golf Course, 4 Paridise Shellduck, 24 mallards.
4. Musick Point Car Park. Rock platform slightly south below car park, 30 VOC. While there this flock took off south and then across the peninsula to the Western side.
5. End of Bucklands Beach. 48 VOC, 14 SIPO. I think the 30 from the rock platform may have joined in to this group as it was the direction they flew.
6. Mid Big Bucklands Beach by boat ramp. 8 SIPO, Flock of 20 Little Black Shag on river. 1 Reef Heron
7. Graingers Point Bucklands Beach. (Between Big Bucks and Little Bucks. 1 Reef Heron. The two Reef Herons were about 400 metres apart. Time at this point, 10.30
8. South end of Bucklands Beach and Half Moon Bay. Approx 120 Red Billed Gulls in this area.
9. Prince Regent Dr. Park 20 mallards.
10. Pakuranga Sailing Club Bramley Dr Farm Cove. 1 VOC, 2 Caspian Terns, 3 R.B.G. 1 Harrier.
11. St Kentigans Playing Fields. Nothing seen.
12. Panmure Bridge. Pied Shag colony, 30 Pied Shag. 22 R.B.G. on mooring posts under bridge.

11:59

13. Tāmaki Playing fields Dunkirk Rd, at Mareth Rd. 62 SIPO 3 VOC.
14. Paddocks north of playing fields at Tāmaki River reserve. 380 SIPO, 4 VOC, 2 Paradise Shellduck, 6 Spur Wing Plover. The SIPO / VOC flock was about 100 metres into the paddock from the playing field fence line. Time at this point 12.00
15. Tahuna Torea Reserve south by ponds. 15 White Face herons, 3 Little Pied Shag, 1 Pied Shag also 3 SIPO seen flying south over the river.
16. Glendowie Reserve at north end of Tahuna Torea. 20 VOC, 10 SIPO, 4 SWP, 2 Paradise Shellduck, 2 White Faced heron.
17. Checked Karaka Bay and Glover Park St Heliers but nothing seen. Time by this stage 13.00

12:59 HT

18. Drove to Otahuhu to check playing fields nothing seen.
19. Highbrook area where Aero Modellers flying area is, near Electrical Sub Station. 16 Pied Stilt, 2 VOC. Also 5 Pied Shag on pilings where water intake goes to the Sub Station.
20. Corner Highbrook Dr and Business Park Parade North. 15 WFH, 19 Pied Stilt, 4 SWP.

1:59

21. Waiouru Pl Highbrook. 2 SWP. Also another 2 SWP on traffic island in Cryers Rd Highbrook.

Finished at 14.30.