

**Shingle extraction and bird breeding on the Ashley-Rakahuri river**  
**Case study – Taggart Earthmoving Ltd operation at end of Swamp Road**  
**September-December, 2018**

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**Background**

Shingle has long been extracted from the Ashley-Rakahuri river. In order to minimise disruption to bird breeding, operators are required to do pre-extraction bird surveys, and keep a set distance from any breeding birds. The main local operator is Taggart Earthmoving Ltd (TEL), which has been associated with the Ashley-Rakahuri Rivercare Group (ARRG) since the early 2000s. They have always had an active interest in the bird breeding situation on the river. In 2015, a wrybill pair started nesting within their operating area, and they went out of their way to minimise disturbance. Despite the nest being within 50m of regular truck movements, the pair successfully fledged one chick.

In mid-2018, TEL started shingle extraction in a 48 ha proposed excavation area on the Ashley-Rakahuri river. Resource Consent CRC072868 allows the company to excavate and deposit gravel, sand and other natural material from the bed of the Ashley River and to disturb the bed and place structures on the bed of the Ashley River. This Resource Consent was issued on 8 November 2010 and expires on 8 November 2020.

The site in question is at the end of Swamp Road, about 3km below the Okuku river junction (Map 1). This map was composited from 54 drone photos taken from 100m height and georeferenced in QGIS. Note that this image was taken after a flood and after most of the nesting activity had finished, thus the extent of the extraction area was greater than when the birds were nesting. The access tracks remained almost the same.

As the area is within the riverbed which has been monitored by ARRG for almost 20 years, this presented a good opportunity to observe the interaction between bird nesting and a gravel extraction operation. Observations started in mid-September and went through to the end of November, when a large fresh caused major disruption to breeding.

**Birds and nest locations within the area**

In mid-September, 2018, TEL started operating in the consented area. A pre-operation bird survey was carried out by professional ornithologist, Andrew Crossland (AC). Gordon Herrick (GH) of TEL accompanied AC and 3 banded dotterel (BD) nests were located and marked.

On the September 18 pre-operation bird survey, the species recorded by AC in the entire proposed extraction area were 15 black-fronted terns (BFT), 10 BDs, 2 pied stilts (PSs) and 1 South Island Pied Oystercatcher (SIPO). A week later, seven BD nests had been located, which included four new ones with 3 eggs each and three found earlier but where the eggs had disappeared – for reasons unknown, although predation was subsequently suspected. There was also a PS nest with 4 eggs. A list of nests is presented in Table 1 with locations shown on Map 1.

Nests were located by observation from a vehicle parked on the tracks. It is quite likely that one or two were missed, but those found were later GPS located with accuracy of around 2-3m.

All distances were taken from the GIS Map (1) and are presented in Table 1. Many nests of both BD and BFT were in close proximity to the shingle extraction zone and access tracks. All these, except three (8, 10 and 11 - see Map 1) were established while the site was being actively worked. Observations were that both BD and BFT would sit tight on nests with trucks passing close by, although those closest (within 5m) would sometimes leave the nest for a minute or two while a truck drove past. Three BD nests (2, 5 and 7) within 15m of an access track were seen to hatch chicks, although the track closest to nest 7 (<5m away) was not frequently used by trucks. Six BFT nests (B, C, D, F, H and I) were within 10m of tracks, most of them by the main track used multiple times daily. All of these nests failed to hatch eggs, but the cause is strongly suspected to be predation, as shell fragments were found (see Predation section below). Apart from nest C, where a single egg was laid actually on a track over a weekend, only one nest (G) was abandoned / deserted i.e. eggs still in nest with adults absent. One pair (A), nesting only 25m from a track and the main shingle digging and truck loading site, were seen to hatch and feed chicks, but it is not known if the chicks fledged. Another BFT pair (G) nested 15m away from the main track, but abandoned the nest (eggs still intact) after 12 days. At this time it was the only one of the original BFT pairs still present within the extraction site. The single PS pair which nested in the extraction area was over 100m away from any access track. This pair hatched four chicks, two of which reached the fledging stage.

### **Nest spacing**

BD nests averaged 67m apart, with the closest being 45m. Five BFT nests were in a tight cluster near the digger extraction site, where they were 22 – 29m apart, averaging 26m. The seven BFT nests further east, including two outside the extraction area (Map 2) were 62 – 97m apart, averaging 74m.

### **Egg hatching and predation**

A disappointingly small number of nests managed to reach the egg hatching stage (Table 1). With BDs it was 27% (3 out of 11), and with BFTs it was 10% (1 out of 10), while the one PS nest successfully fledged 2 chicks. The indications are that these failures were due to predation, and not disturbance caused by the shingle extraction operation. Egg shell fragments were found in the nests inspected soon after the eggs disappeared. This was despite the fact that 5 traps (Timms and DOC200s) have been present for a number of years in the northern berm edge alongside the extraction site, and a further 2 Timms traps were set alongside the nesting area during the observation period (Map 1). In addition, there were 4 traps in the southern berm area on the south side of the main river flow (Map 2). Map 1 also shows where trail cameras were placed alongside 8 nests for limited periods. From a total of nearly 500 hours of camera monitoring these only revealed one image of a predator – a young feral cat passing nest 5. Outside the extraction area, a trail camera picked up rat activity close to a wrybill nest (Map 2) which only lasted 2 days before all that remained were egg shell fragments. For this reason it is suspected that the major predator taking eggs was rats. Rats have only recently become a significant potential predator along the Ashley-Rakahuri river. In earlier years they were almost non-existent, but they are now more frequently caught in DoC200 traps.

### **Shingle extraction and shorebird breeding conclusions**

The major lesson from this case study is that shingle extraction and shorebird breeding can co-exist in close proximity. There was even evidence that birds may be attracted to a shingle extraction site, as many more BD and BFT nests were found within the operation area than outside it – see Map 2.

The area upstream of the extraction activities was not carefully inspected for nests, but no significant bird activity was seen here when checking the traps that were close by. In order for a 'win-win' outcome to occur, it is recommended that:

- The shingle extractors must be interested in, and supportive of, minimising bird disturbance and must be well informed about the birds present and their nesting habits. This was certainly the case with TEL. The practice of conducting a pre-operation bird survey was highly successful here and, in the authors' opinion, should continue elsewhere.
- All truck and heavy machinery movements must be on fixed tracks i.e. no 'wandering' of machines away from these tracks. If machinery movement away from tracks is unavoidable, then an awareness of existing nests is vital.
- Similarly with the digger extracting and mounding shingle. Generally the operational area of this machine is very restricted.
- Movement by employees away from machinery should be discouraged. Birds will happily occupy nests in close proximity to machines, but are disturbed when operators leave machines and wander around. TEL operators were encouraged not to do this e.g. to have lunch sitting inside machines or trucks.
- Food of attraction to predators e.g. lunch remains, should not be discarded on site. Before this was realised, it may have been a reason for a persistent rat presence. However, there is no proof that this link with extraction work had a negative impact on nest success, as all three of the nests found prior to extraction also failed.
- Public use of access tracks must be minimised. In the Swamp road situation, TEL used concrete blocks to shut off access during weekends and holiday periods. During work hours, TEL were also asked to speak to members of the public who arrived and could have disturbed the birds.
- Appropriate signage warning of bird breeding and the need to keep away must be obvious at the main access points.
- Gravel extractors could be encouraged to set up and maintain predator traps.



A Taggart Earthmoving Ltd truck and working digger in the Swamp Road extraction site close to where banded dotterels and black-fronted terns were nesting.

**Table 1. Nests in Swamp Road gravel extraction area - history and location**

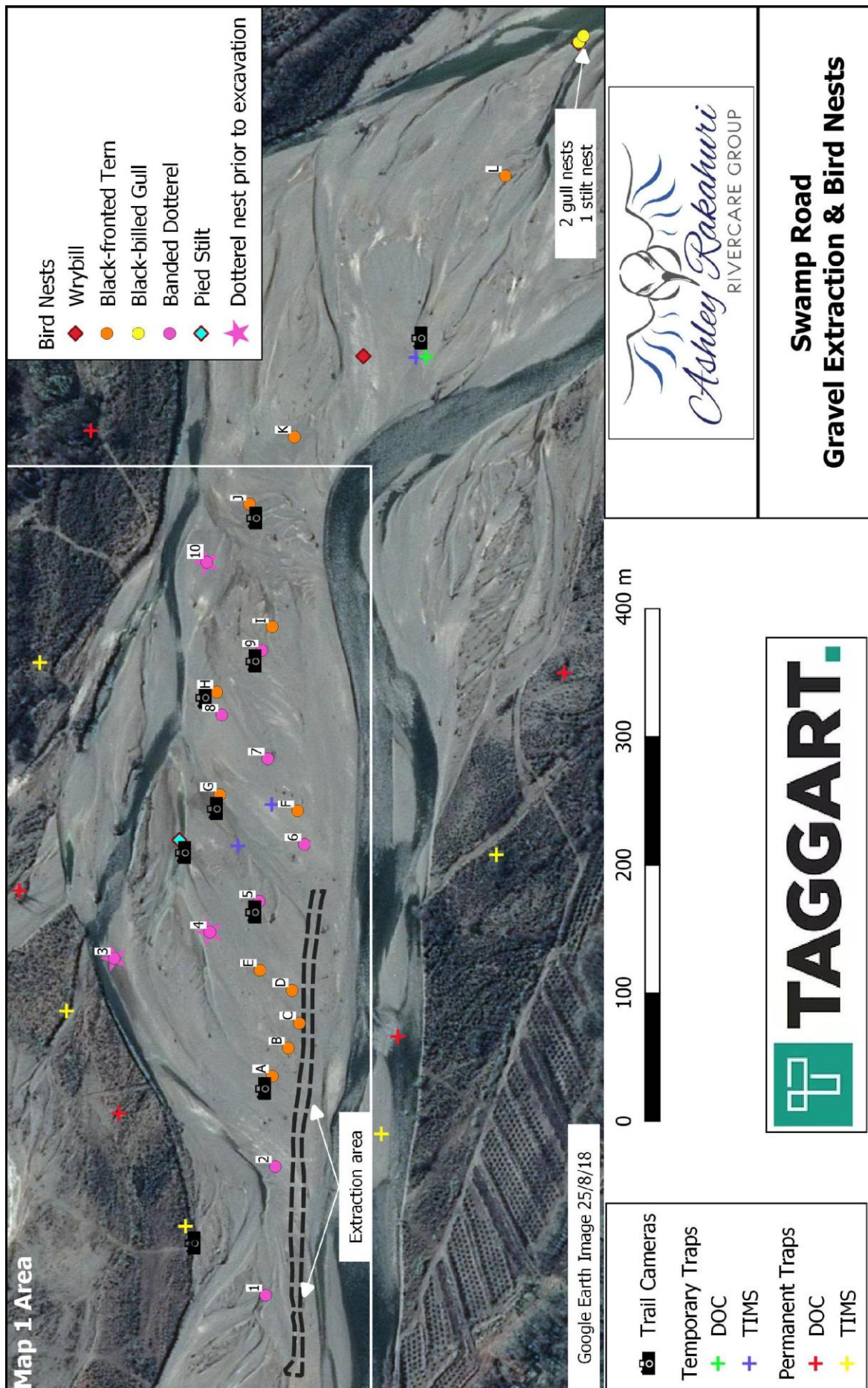
Species	Label	Nest history	Comments	Distance from access track
Banded Dotterel	1	3 eggs @ 21/9. Gone by 24/9.	Outcome unknown.	<5m
Banded Dotterel	2	3 eggs @ 24/9. Hatched 28/9. Chicks seen.	Some chick(s) fledged	8m
Banded Dotterel	3	4 eggs @ 21/9. Gone by 27/9.	Outcome unknown.	80m
Banded Dotterel	4	3 eggs @ 24/9. Outcome unknown.	Outcome unknown.	8m
Banded Dotterel	5	3 eggs @24/9. Hatched Oct 6.	Outcome of chicks unknown.	15m
Banded Dotterel	6	4 eggs @ 27/9. Gone by 30/9.	Outcome unknown.	10m
Banded Dotterel	7	3 eggs @ 25/9. Hatched by 6/10.	Outcome of chicks unknown.	<5m
Banded Dotterel	8	1 egg @21/9. Gone by 27/9.	Outcome unknown.	100m
Banded Dotterel	9	Not recorded	Outcome unknown	10m
Banded Dotterel	10	Eggs @ 21/9. Gone by 27/9.	Outcome unknown.	100m
Banded Dotterel	11	Eggs @ 21/9. Gone by 27/9.	Outcome unknown.	40m
Black-fronted Tern	A	3 eggs @ 19/10. Hatched 13/11.	Outcome of chicks unknown.	25m
Black-fronted Tern	B	2 eggs @ 24/10. Gone by 13/11	Suspect predation (rats?)	5m
Black-fronted Tern	C	1 egg @13/11. Gone next day.	Actually in mid-track - soon abandoned	0m
Black-fronted Tern	D	Eggs @ 5/11. Gone by 13/11.	Suspect predation (rats?)	<5m
Black-fronted Tern	E	Eggs @ 5/11. Did not hatch.	Suspect predation (rats?)	50m
Black-fronted Tern	F	1 egg almost on track. Gone soon after	Outcome unknown.	<5m
Black-fronted Tern	G	2 eggs @ 5/11. Eggs present 17/11, but parents gone.	Deserted due to night disturbance(?)	15m
Black-fronted Tern	H	1 egg @13/11. Gone soon after.	Suspect predation (rats?)	10m
Black-fronted Tern	I	2 eggs @ 30/10. Gone by Nov 17.	Suspect predation (rats?)	8m
Black-fronted Tern	J	2 eggs @ 19/11. Gone soon after.	Suspect predation (rats?)	110m
Black-fronted Tern	K	2 eggs @ 19/11	Flooded out 25/11	130m
Black-fronted Tern	L	2 eggs @ 19/11	Flooded out 25/11	390m
Black-billed Gull		1 egg @ 24/11	Flooded out 25/11	500m
Black-billed Gull		1 egg @ 24/11	Flooded out 25/11	500m
Pied Stilt		4 eggs @ 6/11. Hatched 19/10.	2 chicks fledged	50m
Pied Stilt		4 eggs @ 19/11.	Flooded out 25/11	500m
Wrybill		2eggs @ 18/11. Eggs broken on 19/11.	Suspect predation (rats seen in adjacent trail camera)	208m





Map 1. Gravel extraction activities and bird nests





Map 2. Gravel extraction activities and bird nests – wider area