



**MAKETU ONGATORO
WETLAND SOCIETY**

ANNUAL REPORT

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Introduction from the Chair

How can it be that a 'shed' even a very nice 'shed' defines the year? And yet from my perspective, even though MOWS has grown significantly in other areas, The MOWS Gear Shed' was what stood out during the year. It took us over two years to sort out the land lease, raise sufficient funds and obtain Resource Consent so that we could start. The groundwork was done by Joe Pihama on November 13th 2017, but it was not until early May 2018, that we were able to start using it as our main operational hub. The shed was built by Paul Williams of Kitset Sheds, and while he was not the fastest builder around, he has certainly left us with an extremely well-constructed shed which we are sure will withstand anything the elements can throw at it, so 2018 is the year of the Shed. We now have an amazing asset – possibly the most expensive shed in the western bay!

2018 is also the year that MOWS education programme, run by the inspiring and persistent Tania Bramley, really came of age, we moved up a rung to start dealing with both Te Puke Intermediate School and Te Puke High School. This is a pretty amazing achievement and one which we would not have managed without funding from Bay Trust and the strong and continued support of Glenn Ayo at Western Bay of Plenty District Council (WBOPDC).

But wait, 2018 was also the year of MOWSES, the MOWS Environmental Services team, run by Will Anaru. We managed three major weed control contracts for Bay of Plenty Regional Council (BOPRC): Spartina (invasive grass) eradication in Maketu Harbour, and weed control on Papahikahawai Island and Whakapoukorero Wetland. MOWS also started contracting to WBOPDC at Midway Park in Pukehina and at the Kaiate Falls in the back of Welcome Bay. And we did a number of one-off jobs for BOPRC and Te Arawa Lakes Trust.

At the same time we kept our four Biodiversity Management Plans (BMPs) ticking over, this included Ecological Baseline Services monitoring run by our Science Officer, Moniqua Nelson-Tunley.

Trevor Hughes, an early supporter of MOWS passed away this year. He was one of the original signatories of the MOWS registration document. Trev will be remembered for his strong sense of community and his huge work in restoring Kotukutuku Gully, previously a rubbish dump, and now an ever improving area of bush in the middle of Maketu.

A key element of what we are trying to do is broaden our base, to involve more people in the community, and ensure that the work we do continues into the future. It is not about money or people, but the environment, because at the end of the day, that is what matters, we depend on our environment for our whole life-support system, so it makes sense to look after it.

Thank you for your support
Julian Fitter
31st October 2018.



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MOWS Gear Shed

This was one of those projects that ended up being far more costly than we could possibly have imagined at the start. The first step was to decide on a location, somewhere quite close to the village with good vehicular access, and then to sort a lease agreement with the owners. In this instance, we were fortunate that when we approached Te Arawa Lakes Trust (TALT) back in March 2014, to see if we could site the shed on their land, close the Maketu Fishing and Recreation Club on Wilson Road North, they were quick to agree and by July we had a draft lease to work on. We also had negotiations with the Maketu Fishing and Recreation Club who were very supportive of our proposal. Drawings of the design and location of the shed were done for us by Sheryl Kramer, and we are extremely grateful for her contribution.

With the lease agreed, we then had to find the money to build. First to the party was Tauranga Energy Consumer Trust (TECT), who granted us some funding in 2014, however not enough to complete the shed, and by the time we had additional funds, we had taken too long to drawdown all of the TECT funds and had to return the balance to TECT. Fortunately, they came to the party a second time, in late 2015, and then again in 2018. This together with generous contributions from Baytrust and One Foundation enabled us to get the building built.

Work on the site actually started in November 2017, when Jo Pihama turned up with his digger and a 12 tonne roller. The framing went up on December 7th, and the shed was finally finished in May 2018, more than four years after we started off, however the finished product is an amazingly useful facility. Big thanks to Paul Williams of Kitset Sheds who built the shed for us, definitely built well and able to withstand anything the elements can throw at it. Our shed warming party (below) was a great chance to celebrate this milestone.



Biodiversity Management Plans (BMPs)

We run four Biodiversity Management Plans (BMPs), funded by BOPRC, WBOPDC and the Department of Conservation (DOC) with some additional support for Newdicks BMP from Te Puke Forest & Bird. All plans are running well, with very significant ecological gains.



Maketu Spit with Papahikahawai Island with the causeway removed.

Maketu Spit – Year 8

It was business as usual on the spit itself, though big changes were continuing to happen next door, on Papahikahawai Island. The removal of the causeway to Papahikahawai Island, and its replacement with a bridge had some implications for the spit, mainly for the upper lagoon area that is technically known as the Maketu Harbour Wildlife Management (WMR) reserve, but was previously known as “the stagnant pond”. Following the removal of the causeway in 2017 the algae on the surface continued to reduce, until on January 5th a high spring tide accompanied by storm surge rose above the stop banks of the WMR to flood Te Paika (the area purchased by BOPRC from Alan Brain). One impact of this was to remove nearly all of the algal scum and deposit it on Te Paika. The other was that it flooded our plantings along the harbour edge, and killed many of the plants.

Further down the spit we continued the removal of the dead pines which had fallen, or were in danger of falling onto the beach. We held three burning sessions to dispose of the dead wood, and poisoned another batch of pines. We expect to have dealt with all of the pines in the next 2 years but it will take a few more years to be rid of the skeletons. Some of the dead trees have provided good shelter for native shrubs, mainly taupata *Coprosma repens*.

Weed control was ongoing; there are still small numbers of pampas and the odd seedling of Italian buckthorn and gorse. Lupins still appear from time to time and purple groundsel, *Senecio elegans*, is still about, but is well under control. We continue to work to restrict black medick *Medicago lupulina* and a taller clover, probably melilot *Melilotus officinalis*, which are gradually becoming more prevalent, the trick is to find a suitable calm day in early August, and that is never easy. We also continue to control kikuyu and tall fescue grasses, and a new grass which has appeared on

the main trail, and which we appear to have spread to the Waihi Harbour WMR. Biosecurity is a constant concern, especially as the gull colony seems to bring in at least one new invasive grass species every year.

Dune profile monitoring – Maketu Spit

This is our ongoing programme, run with BOPRC, aiming to keep track of the erosion or growth of the spit at its narrowest point. As in previous years there was a very slow erosion of the inside of the spit, but a tendency to accumulate sand on the ocean side. We do not know what influence the re-diversion of the Kaituna River will have. The opening up of the Maketū Harbour WMR, by the removal of the causeways to Papahikahawai Island, does not appear to have made any significant immediate impact.

Over the years we have come to appreciate the value of aerial photography to assist with management decisions and to get a better handle on what is happening at our four major projects. With advent of drones, aerial photography has become a lot easier to organise, and generally less expensive. The quality of the photos and what you can do with them is also better than with a handheld camera. So this year we decided to start building regular drone surveys into our management so that we are able to track changes, especially topographical ones, to our project sites.

Earlier in the year, we obtained some useful drone footage and photos through our work with Te Puke High School, but we were looking to be able to get an aerial photo of the whole site which is 3.5km long. One of our committee members, Robin Hartley, is very knowledgeable on these matters, and with the help of some funding from WBOPDC, we were able to employ Interpine Ltd. to take footage of our four sites. Robin then took these videos and stitched still shots together to make a single photo. They are incredibly detailed and can be 3D. We can also use them to measure the volume of the spit, or to take a cross section. These detailed photos will enable us to track changes on the spit, which will be particularly useful with the opening of the new barrage at Fords Cut, so that we can see what changes result from the increased outflow.



Maketu Spit – Orthomosaic image from drone survey, showing how you can zoom in for detail.

Dotterel Point Pukehina – Year 5

This is a project that never ceases to amaze. Our native sand binding plants *spinifex* and pingao *Ficinia spiralis* have an incredible ability to build a dune. And we now have a very significant dune built purely on the ability of these two plants to hold and bind the sand. There are still a couple of places where the sea runs through on high tides with a big sea, but these are narrowing every year. We also have to move the fence every year; it is gradually migrating seawards as the spit is eroded on the harbour side while the beach builds on the ocean side.

In the main vegetated area, we have continued our war on iceplant *Carpobrotus edulis*, tree lupin *Lupinus arboreus* and purple groundsel *Senecio elegans*. These are no longer a serious problem, but need ongoing control, as does the small amount of coastal wattle *Acacia sophorae*. We have however had a bit of an invasion of alien veldt grass *Ehrharta erecta* which we are currently dealing with. Two other weeds that we are focussing on are montbretia *Crocasmia x crocosmiflora* and Bermuda buttercup *Oxalis pes-caprae*, both of which are hard to deal with as they have corms which spread underground.

On the plus side we obtained permission to remove one of the large Norfolk pines *Araucaria heterophylla* which tend to dominate the area to the detriment of the forty or more native pohutukawas *Metrosideros excelsa* which are the natural inhabitants of the area, We plan to remove the remaining trees over the next few years.



Dotterel Point, Pukehina – Orthomosaic image from drone survey, showing extent of dune growth.

Newdicks Beach - Year 4

After a very wet summer our primary focus has been weed control and preparing the bank zone sites for planting. We had a great working bee in August where families came along to plant trees on the bank zone, followed by Te Kura o Maketu planting in the dunes and along the base of the bank zone with Coastcare. Plants in the ground this year include: 144 pingao, 192 wiwi *Juncus sp.*, 30 pohutukawa, 100 taupata, 40 coastal mahoe *Meliclytus novae-zelandiae*, 48 five finger *Pseudopanax arboreus* and 50 karo *Pittosporum crassifolium*. The mixed native planting along the edge of the car park is coming along nicely and we should be able to remove the rope fence next year.



Newdicks beach car park, orthomosaic image from drone survey, image can be zoomed in for high detail of the upper car park plantings and dune width in front of car park.

We had a stormy season with significant erosion of the dunes but thankfully the *spinifex* and pingao planted in 2017 are persisting along the base of the bank zone. Three slips have altered the bank zone, providing opportunities for planting sites in 2019.



From left: Pohutukawa trees planted in 2017 along the car park edge and storm surge damage to the Little Waihi end of the Eastern dune (Autumn 2018).

Waihi Harbour Wildlife Management Reserve - Western Section – Year 4

We are making steady progress in this reserve. Our main focus has been on planting down the western stopbank, bordering the Wharere Canal and Kaikokupu Stream. Some of the trees, particularly the ngaio *Myosporum laetum*, have done spectacularly well, to the extent that we have

to contemplate trimming them back where they are starting to obstruct the trail. We also planted four large karaka *Corynocarpus laevigatus* trees that were gifted to us by Paul Williams (our shed-builder). These have done really well and no longer need the stakes supporting them.

Work along the windrows formed by the pampas *Cortaderia selloana* we removed in 2015 can be a bit of a challenge as the weeds really love the conditions and the wattle seedlings spring up in their hundreds and grow 2m or more in a year! However, once we manage to get good tree cover, weeds become less of a problem and we are hopeful that after one more season of planting, we may have sorted out that section, though there will always need to be some weed control.

DOC cut some more wattle trees for us and the current plan is to start planting on the eastern side of the main wetland, along the western bank of the Pongakawa stream in late 2018 and focus on that area over the following few years – the bund is slightly less fertile than on the west as it is mainly made up of stream dredging's which contain a lot of ash and pumice.

In the enclosed wetland area, which is largely freshwater, we managed to get in and spray most of the remaining pampas in the northern section; we plan to hit the southern section next year. This is a good area for duck and waders. Royal spoonbill *Platalea regia* are a regular visitor here as are our resident Australasian bitterns *Botaurus poiciloptilus*, so it is an important area to get right to ensure suitable habitat for all species. This was not helped this year by someone, most likely a duck hunter, who went to the trouble of ramming a steel waratah into the mud underneath the flap gate to prevent it from shutting and thus flooding the wetland, presumably the aim was to attract more ducks. It took us a while to work out what the problem was, but was not hard to fix once we did.

In the saltmarsh area, we are focussing on sea couch, and have made some progress on its removal, but it is quite time-consuming work and has to be done at low tide using the ATV, or very high tide using the MOWS Punt Speedy Gonzalez.



Waihi Harbour (WMR) Orthomosaic from drone survey. From left: Wharere Canal, Western Section of WMR, Pongakawa Stream then the Eastern Section of WMR.

Waihi Harbour Wildlife Management Reserve Wetland (WMR) - Eastern Section

We have not started any planting programmes on this area, largely because we have been doing so much on the western section. We have kept up our onslaught of the gorse and pampas, and it is good to see quite a lot of native vegetation, mainly giant rush *Juncus pallidus* developing. These help to stop the weed growth. One major milestone was getting out to the two 'islands of pampas' in the saltmarsh. These are nearly 200m from the stop bank. Our thanks to Milly Farquar from BOPRC, who funded an extra 100m of hose on a reel to enable us to get out to the islands. This also shows the value of having the trailer sprayer which is very effective in difficult to reach areas.

We also used the punt, Speedy Gonzalez, that we have leased from DOC to start tackling the problem of sea couch in the eastern section. This area is not accessible using Muffin and so has to be tackled at high tide using Speedy G.

Trapping continues on the eastern side, with rather fewer kills than on the west side, but that is to be expected. A nice experience one day, we were driving back up the stopbank when we came across a bittern, we think probably a young one, who was very reluctant to fly. We followed him/her for quite a way before he gave up and took off into the saltmarsh.

One slightly worrying development is the erosion that is occurring on the eastern side near the estuary. We have lost over a metre of bank which is quite a lot of additional material washed into the harbour. This is similar to problems in Maketu Harbour. We are contemplating planting some *Glyceria*, a non-native grass that is already found on both streams, as this provides a very healthy buffer and will allow the bank to stabilise.

"By de Ley" Wetland

Previously known as The Borrow Pits, this is not a MOWS project, but is run by MOWS member Peter Ellery under the auspices of the Maketu Taiapure with a clear focus of looking to increase the living and spawning habitat for native Galaxiid fish.

A year has gone by so quickly, (no comments about a sign of getting older required) but the only major event at the wetland was the removal of 50 mature harakeke flax plants and their replacement with a mix of manuka and *Carex secta*. A lesson learned that it's easy to over-plant with flax and they get so big that access to the ponds required incessant trimming of the leaves just for room to be there, also total pain around track mowing. Predators seem to be a bit more under control with only 2 hedgehogs and 3 juvenile ginger cats caught so far this year though seeing they were less than half grown presumably there's still a mother around somewhere. While I had thought I was on top of the stoats I was keeping still watching some fish in a pond about 3 days ago and a stoat ran across the gap in front of me about 2 feet away, bugger was just too far away for me to stamp on it, will have to try some new bait. Still regularly see the resident bittern and almost constant calling of fernbirds this spring.

Prior to the whitebait season opening we had thought it was probably going to be a poor year for them. The spawning in the autumn was a lot lower than previous years with only hundreds rather than thousands of adult inanga present and over-wintering numbers in the ponds. With whitebait arriving in the ponds until about a week before the season and normally would see them around a month before but the season has actually been better than last year with some good catches on the river. Peter has been doing his bit for their survival by a few days whitebaiting and liberating all he caught back into the ponds, about 5-6 kilos that will not end up as fritters but will get a better chance to mature and reproduce.

Another success is the new wetland that Peter designed for Graeme Pattie's farm on the Pongakawa River, 24 ponds excavated last autumn, 5000 plants in around the waterways through the winter and the whitebait have just poured in there with all the ponds right back to the springs absolutely seething with fish. A few more properties doing small projects like this on our rivers will make a big difference to the survival of our ikawai.

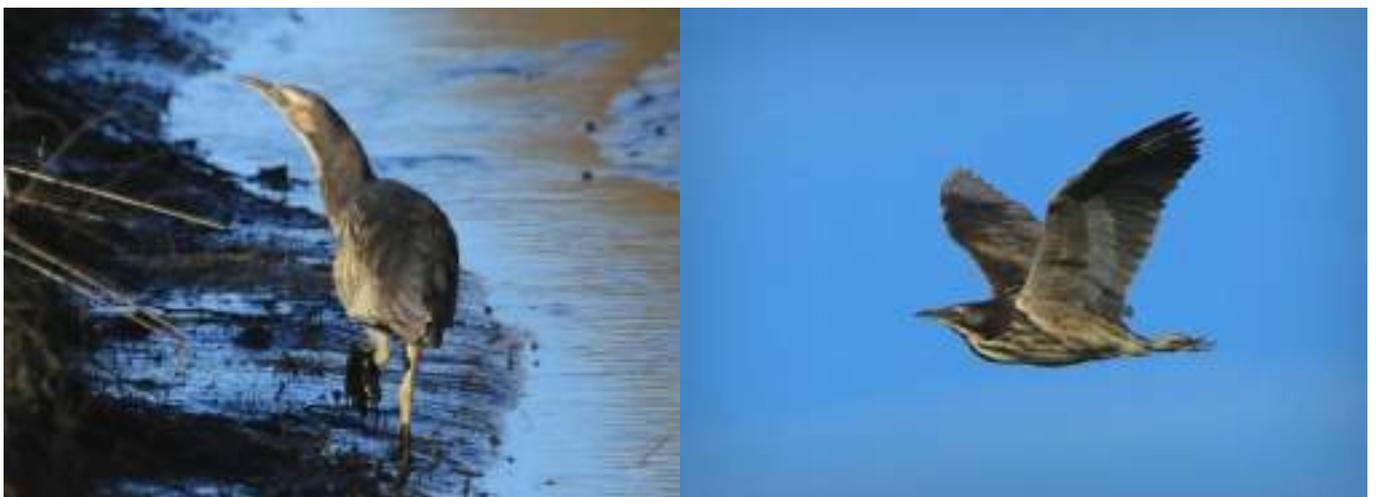


Peter Ellery showing students a native bully caught in the By de Ley ponds.

Biodiversity Monitoring

Bittern Monitoring –Waihi Harbour Wildlife Management Reserve (WHWMR)

Since the first release of two Australasian bittern in August 2016, initially Sheelagh Leary, then a small team of people have assisted DoC by monitoring bird locations. Using the radio signals emitted from the fitted transmitter backpacks, we have been able to learn about preferred habitat, feeding and breeding spots.



A Cutwater Rd resident – images captured by Phillip Young.

The WHWMR has shown some very encouraging signs as a habitat – Pearl (Tx 38) is the first released bird to have survived beyond six months and was successfully tracked for 21 months. She was located in the eastern WMR as late as May 1st this year, but the “stationary” signal was picked up two weeks later (fate unknown).

In December 2017, a local male was caught and tagged with both radio transmitter and GPS locator. Like Pearl, Teddy has stayed here. He shed the transmitter this month but no evidence of struggle was seen, so we assume he roams still. This ‘stay-at-home’ behaviour is unlike that found at any other bittern sites in NZ.



Left: Karl McCarthy (DOC), Te awa, Melv and Te awahi listening. Right: Fitting the Transmitter backpack.

In autumn, drone surveillance was done both by day and using infra-red sensing after dark. The image of various native creatures was clearly identifiable, but also a disturbing number of pests despite the trapping being done. The latest bittern to be released was another female which had been found starving in Waimapu estuary in February. She was raised at an aviary near Hamilton and released into WHWMR at the end of Wharere Rd in August. We will watch with interest how Tumanako – ‘Hope’ (Tx 40) settles in.

The next DoC activity will be in October listening for booming at the start of breeding season and assistance will be welcome. There will be attempts to capture and tag further males (at least four have been heard previously), and perhaps recapturing Teddy if he hasn’t become trap wise.

The birds are regularly seen on the last Cutwater Rd farm, in drains or commuting about the wetland. For more info, see <https://www.facebook.com/Bittern-Conservation-New-Zealand-120586604662542/>

Shorebird and Seabird Monitoring

It was another interesting year for the Maketu and Little Waihi Estuaries. One of the most remarkable sights was of a massive influx of Pacific Golden Plover. These estuaries hold one of the largest flocks in New Zealand usually between 40-50 individuals. This year saw a record count of 130 birds. Where the new arrivals came from is something of a mystery. Hopefully they will be back this summer. There were the usual sprinklings of rarities including a single Lesser Sand Plover. This bird is very similar in plumage to the Banded Dotterel which frequents the estuaries through the year. It is a very rare visitor to New Zealand with only one or two individuals in the country most summers.

Other unusual birds included a Hudsonian Godwit amongst the Bar-tailed Godwits. This is the second year this bird has spent time in Little Waihi. Bar-tailed godwits were recorded three times on the spit during the monitoring season, the largest flock was around 300 birds on November 12th. Two Marsh Sandpipers were resident throughout the summer at Little Waihi with one Pectoral sandpiper and a Sharp-tailed sandpiper. Regular visitors to Dotterel point may have seen the small flock of Wrybill that roosts there. The sharp-eyed may have picked out a single Red-necked stint hiding amongst them.



*Left: Hudsonian Godwit at Little Waihi. Right: Little Tern at Dotterel Point, Pukehina
(Photos: Tim Barnard).*

Two little terns, a tiny delicate seabird, were often recorded at both Maketu Spit and on Dotterel Point between Christmas and April. An unidentified vagrant tern with a bright red bill was also recorded, this could have been a South American tern which has not been recorded in NZ before, the other option was an Antarctic Tern which has only been recorded as far north as Stewart Island.

Other species recorded year-round are Royal Spoonbill and Pied stilt who have really appreciated the new wetland created on Papahikahawai Island, and they were the first species to breed there. Black-backed gulls are always around. We generally discourage them by piercing their eggs. This year one pair managed to breed and raised two chicks. While they are a native species, their population is artificially inflated by scavenging on rubbish dumps etc. They are a clear threat, especially to NZ dotterel and Variable oystercatcher.

Pied shag are also present year round and breed in the pine trees at the Te Tumu Cut. South Island Pied Oystercatcher are here over the winter, but then head south to breed in the South Island. The first returnees were recorded back here in December. Spur wing-plovers often breed on the spit in winter and were recorded on four of the seven monitoring visits during the spring and summer.

MOWS rodent control operation on Maketu Spit produced excellent results this year, indicating possibly one rat left behind, we may have reduced the population so that it is possible to eradicate them each year. We know however, that they will be back. We had a major flooding event on January 5th caused by a storm surge coinciding with a spring tide, reckoned to be the highest tide for some 60 years. However nesting was over and the unfledged young were able to move out of the way. In other respects, breeding success was good, though as usual monitoring the dotterel numbers at Maketu is a tricky as the vegetation offers excellent cover for them.

Northern New Zealand Dotterel - *Charadrius obscurus aquilonus*

On Maketu Spit, the average number of birds observed was up slightly on last year to 28, however no chicks were observed due to vegetation cover. Some of the birds recorded in November

onwards are likely to have been fledged young. 12 different banded birds were observed during the season, six of which were only observed once, in September, when vegetation cover is a lot thinner making colour band observations much easier.

At Pukehina, where observation is a great deal easier, numbers were up on 2016/17 with an average of 21 birds observed and 13 different band combinations seen. Only four of these were viewed just once with only two birds seen on each visit. The maximum number of chicks recorded on any one visit was 7. The last monitoring visit was on January 22nd, when 29 birds were observed, at least 5, and probably 7, of which were first year birds as they were observed as a group on the oceanside beach in a loose group, all un-banded.

The overall indications are that the Maketu population is stable and that the Pukehina population may still be growing. The overall population is now in excess of 20 pairs.

	2009 2010	2010 2011	2011 2012	2012 2013	2013 2014	2014 2015	2015 2016	2016 2017	2017 2018
NZ Dotterel-avg.	16	21	14	22	27	29	27	26	28
NZD Juveniles	6	8	3	6	3	4	5	1	0
Variable Oystercatcher avg.	20	29	22	28	30	29	44	42	49
VOC juvenile	7	9	3	16	10	10	5	8	20
Red-billed Gull- Ad.	400	800	100	400	1000	1000	1600	1000+	1500
Black-billed gull-Ad			Nil	79	50	50	71	72	58
Black-billed Nests			Nil	43	28	38	36	36	45
White-fronted tern-Ad	44	240	30	42	250	350	320	300	300
WFT - nests	25	120	Nil	Nil	125	154	<200	Nil	300

Table 1: Bird monitoring data for Maketu Spit from 2009 to 2017-18 breeding season. Numbers of juvenile dotterels underestimated as hard to count due to vegetation. In 2011 - 12 pairs of NZ Dotterel were breeding before the MV Rena event.

	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 2018
NZ Dotterel-avg.	13	14	15	17	18	21
NZD Juveniles	2	3	7	8	8	11
V. Oystercatcher- avg.	15	20	20	25	26	26
VOC juvenile	4	4	5	10	12	18

Table 2: Bird monitoring data for Dotterel Point Pukehina from 2012 to 2017-18 breeding

Variable Oystercatcher – *Haemantopus unicolor*

The numbers at Maketu Spit appear to be continuing to grow, with nearly 50 birds viewed on each visit, up from 42 in 16/17. A maximum of 6 immatures were observed in November and we would estimate some 10+ young fledging. Pukehina gave a similar story with the average numbers observed in line with last year, but with as many as 20 birds fledging. Again, observation of young is much easier here, so we would expect the actual figures at Maketu to be greater than observations indicate.

Red-billed Gull - *Larus scopulinus*

Another excellent season, but without an aerial shot, it is very hard to estimate the number of pairs, they are spread out over a considerable area some of it vegetated, but our notes indicate numbers in excess of 1000 birds, with something like 3000 birds in December when there are large numbers of fledged young around. So an estimate of 750 nests would likely be reasonably accurate – we are working to ensure that we get an aerial this year. Fledging rates appeared to be good with no evidence of unusual mortality. Small numbers of red-bills were observed at Pukehina.



Red-billed Gull colony, Maketu Spit.

Black-billed Gull – *Larus bulleri*

These nested in their usual place on the beach edge of the red-bills colony but surrounded on 3 sides by the red-bills. This would appear to be a security choice as the birds are protected on three sides but able to escape if necessary. A maximum of 34 nests were observed on October 14th, however there were still 10 sitting birds on December 10th, which suggests that the total number of breeding pairs may be closer to 44. All the birds had left the colony by January 22nd and this is line with previous years when they all disappeared well before the red-bills leave the colony.

White-fronted Tern – *Sterna striata*

Last year, the terns did not breed. They had just started when a series of high tides washed their nesting site away and the red-bills moved in, as they too had lost nests. This year the terns returned, with a few birds seen in mid-October. Nesting really got underway in November. We had around 300 pairs. And, being late starters, they also leave the spit last. On January 21st there were some still 20 adults and 60 immatures in the colony. All the latter were fully fledged, and would likely have left permanently by the end of January.

Birds New Zealand Survey

We carried out two surveys of Maketu Harbour and Spit for Birds New Zealand – previously known as the Ornithological Society of New Zealand - one in November '17 the other in June'18. This is part of an ongoing bay-wide survey which provides useful background data for decision making. The biggest single change over the year was the increase in pied stilts in the new wetland on Papahikahawai Island. From the table, it is easy to see the seasonal variation, but also because it is just a spot check on two days a year, needs to be interpreted carefully. For example it is fairly clear that there are quite a lot of Canada geese and black swans around most of the time. However there are only two records of large numbers of bar-tailed godwits, however the fact that there are two records, indicates that this is not just an isolated occurrence, but that there is a significant flock around in the spring and summer, with much smaller numbers during the winter. Some records are very seasonal. Black-billed gulls clearly are round only in the spring when they breed on the spit, while red-billed gulls are with us year round, albeit in reduced numbers in the winter. The idea of the chart is to give an idea of how varied our birdlife is, and how important the two estuaries are in supporting it.

Reptile Monitoring

Three species of reptile have been caught to date; shore skink (*Oligosoma smithi*), moko skink (*O. moco*) and plague skink (*Lampropholis delicata*). Shore skinks are a native, naturally uncommon species that inhabit intact coastal environments of the upper North Island. This is the main species found at the Maketu Ongatoro Wetland Society sites, and so the bulk of monitoring information is in regards to this species. Moko skink are a native, relict species (now occupying <10% of their former range, but over 20,000 individuals and population stable or increasing), which have suffered a significant decline as a result of human impacts (Hitchmough et.al. 2015). Plague skinks (formerly called rainbow skinks) are rapidly spreading across New Zealand and are able to reach high population densities in a short time. It has been hypothesised that plague skinks could out-compete native lizards, although real-world data is lacking. As plague skinks reach greater population densities than native species, it is reasonable to expect that predation pressure on invertebrate populations will intensify (Department of Conservation).



*An adult female shore skink, Oligosoma smithi, at Newdicks beach
(Photo: Moniqua Nelson-Tunley).*

Plague skinks were detected at Waihi Wildlife Management Reserve East in October 2018. Only two plague skinks were seen during over a period of several hours, so it appears the population has not reached plague levels yet. A plague skink was detected in February 2015 at Maketu spit, but repeated monitoring has failed to detect further individuals of this species.



The most reliable method of differentiating between native (left) and plague (right) skinks are the scales between the eyes. Both skinks pictured have four scales forming an arch over the eye. Between the two arches are scales that form an hour-glass shape. In the native skink, the hour glass shape is formed of three scales and in the plague skink it is formed from just two scales (Photo: Moniqua Nelson-Tunley).

A single Moko skink has been detected at Dotterel Point's backdune reptile monitoring grid in November 2016. They have not been detected since. All other reptiles caught for this monitoring project have been shore skinks.



Moko skink, Oligosoma moco, caught at Dotterel Point (Photo: Moniqua Nelson-Tunley).

Reptile monitoring commenced at Dotterel Point, Newdicks beach and Maketu spit in September 2014 and since then has been conducted twice yearly in spring and summer. Monitoring was not conducted in summer 2018 due to frequent inclement weather. Monitoring at Waihi Wildlife Management Reserve West was conducted in November 2016 and February 2017 without detecting any lizards.

The number of shore skink captures at each site varies year-to-year, with Dotterel Point having less fluctuation between catch periods than Maketu spit or Newdicks beach. Newdicks beach and Maketu spit seems to be affected by the same variable as they follow roughly the same trend. The cause of the fluctuations might be weather. Dotterel Point is possibly more sheltered than the other sites due to the Maketu headland to the Northeast (prevailing wind direction is north to northeast) (Chappell, 2013). Personal observation is that skinks are less active (i.e. are more likely to stay within their refuge) during windy weather. This is partially backed up by my records of weather during the February 2016 monitoring period, where there was a light to moderate northly wind at Maketu and either no wind or light southerly and noreasterly wind at Dotterel Point over the three days of monitoring.

Photo identification

Photo identification (Photo ID) of shore skinks have been conducted at all sites. Photo ID allows for repeat identification of individual lizards, both over a single monitoring period and across monitoring periods. The most reliable means of identifying shore skinks is to take a close-up image of the left and right sides of the face. Photo ID has not been completed for all of the monitoring periods yet, as it is a time-consuming process to compare each photo with all the preceding photos to determine if it is a recapture or a new individual. At present, all skinks from Newdicks beach have undergone photo ID, as well as all lizards caught at Maketu spit and Dotterel Point from February 2016 to present. Maketu Middle grid and West grid have also been identified for the November 2015 period. Each skink is given a unique name based on its' capture location and the order of identification i.e. the first skink identified at Maketu East grid was given the name ME1 and the second was given the name ME2. A total of 135 shore skinks have been identified using this method, with photo ID still required for earlier monitoring periods.

Monitoring grid name	Number of individuals	Monitoring periods
Maketu East	32	Feb-2016- Nov 2017
Maketu Middle	20	Nov 2015- Nov 2017
Maketu West	5	Nov 2015- Nov 2017
Dotterel point foredune	15	Feb 2016- Nov 2017
Dotterel Point backdune	40	Feb 2016- Nov 2017
Newdicks carpark dune	7	Sept 2014- Nov 2017
Newdicks far dune	16	Sept 2014- Nov 2017
Total	135	

Table 3: Number of shore skinks identified at each monitoring grid and periods for which skinks have been identified.

Invertebrate Monitoring

There has been no further work conducted on invertebrates since the 2017 report, Invertebrate monitoring will be repeated in three years' time in order to detect changes over time.

Vegetation Monitoring

There has been no further work on vegetation monitoring since the 2017 report, a repeat survey is planned for November 2018. In 2017 few pest plants were detected at Maketu Spit, likely the results of long-term pest control at this site. Pest plant control has been undertaken for a shorter period for Newdicks beach and Dotterel Point, and thus there are more pest plants present.



The colours of wiwi (foreground) backdune and spinifex (background) foredune at Maketu spit.

Monitoring Summary

- Shore skinks have been recorded consistently at Dotterel Point and Maketu since monitoring began. The eventual detection of shore skinks at Newdicks beach could be related to pest control allowing the population to increase to detectable levels or to become more active as less predator avoidance is needed. Fluctuations in the number of skinks caught over time appears to be in response to weather.
- To date, 135 shore skinks have been reliably photo identified. One moko skink has been detected at Dotterel Point and three plague skinks have been detected; two at Waihi WMR East and one at Maketu spit.
- Invertebrate monitoring has revealed a large population of garden snails at Maketu spit, which may have negative effects on the vegetation.
- Dotterel Point has the highest invertebrate species richness, high plant species richness (except for RECCE 1, which was placed in an area recently colonised by spinifex), often the highest number of skink captures per monitoring season, and the highest number of lizards identified in a monitoring grid.
- A marooned live Bronze Whaler Shark was a surprise find at the back of the Little Waihi, by MOWS member and ornithologist Tim Barnard.



Bronze whaler shark, Little Waihi (Photo: Tim Barnard).

Animal Pest Control

Maketu Spit

The pest control programme is running well on Maketu Spit, with all three fences working effectively. We had excellent results from the rat bait set at the distal end in July prior to the dotterel breeding season. Track-pads showed an apparent 100% success rate – no rats or mice remaining.

The New number #3 fence is performing well as a first line of defence, with the majority of pest being caught by it this season, even with Papahikawai island having the causeway removed, pest animals are still present on it and while the gate is rabbit proof, we know that rats and stoats can swim.

We did not do any rabbit control on Maketu Spit during the year, but did control work on Papahikawai Island using pindone for BOPRC.

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Total
Rat	2	6	6	14	11	13	15	67
Mouse	10	0	0	14	0	11	14	49
Mustelid	4	8	7	6	6	12	1	44
Hedgehog	7	1	10	12	4	3	0	37
Rabbit	0	0	2	1	0	0	0	3

Table 4: Annual trapping data, Maketu Spit.

Newdicks Beach

We have an ongoing trapping programme in the eastern dune with declining pest numbers observed. In September 2 x Good Nature traps for Possums were set up in the middle of the bank zone, at the site of this year's planting. One doe with a baby and one buck were caught in the first week and nothing since. We plan to leave one at this site and move the other one around the BMP area on a monthly basis.

	2014	2015	2016	2017	2018	Total
Rat	8	83	82	27	58	258
Mouse	5	6	3	1	4	19
Mustelid	5	19	7	0	8	39
Hedgehog	2	15	6	0	4	27
Possum	N/A	N/A	N/A	N/A	3	3

Table 5: Annual trapping data, Newdicks Beach.

Waihi Harbour WMR – West

As you might expect, after an initial flurry in the first two years – trapping numbers have settled down, and following an infra-red drone survey, we upped our focus on possum which has produced good results. We do know there are more, and they are known to become trap-shy. We are very concerned at the ongoing trapping of feral cats. As far as we know these are not resident, but arrive from time to time, and probably are being dumped. While they do help to keep mouse populations down, they are the biggest single threat to the native wildlife, both birds and reptiles.

We recently did a track-check, and found that there were still a number of hedgehog around, so our focus will be on these as well as the regulars.

Waihi West	2016	2017	2018 to 30 Oct	Total
Rat	47	31	26	104
Mouse	17	7	0	24
Mustelid	38	10	12	60
Hedgehog	23	10	6	39
Cat	3	4	3	10
Possum	1	0	7	8

Table 6: Annual trapping data, Waihi Harbour WMR – West. Figures for mid-2015 were lost due a technical glitch – they included at least 20 possums.

Waihi Harbour WMR – East

We pay somewhat less attention to this side of the reserve at present, in part because much of our budget is expended on the western side. As well there appear to be fewer pest species on the east. The trapping we are doing seems to be keeping things under control. The area is less than half the size of the western section, and trapping numbers are around 25% of those in the western side.

Waihi East	2016	2017	2018 to 30 Oct	Total
Rat	5	9	9	23
Mouse	2	7	0	9
Mustelid	7	7	5	19
Hedgehog	1	1	2	4
Cat	0	1	3	4
Possum	1	0	7	8

Table 7: Annual trapping data, Waihi Harbour WMR –East. Trapping began April 2016.

External Contracts

Our External Contract unit, run by Will Anaru is a key part of MOWS operation. The idea behind it is to generate additional funds to support MOWS running costs, including rent and maintenance of the shed. However it also helps to ensure that we have enough members available to do all the work on our four BMPs. 2018/19 was the first year we had really run it as a unit, and it was very successful. Our training programme works in two distinct ways, firstly the theoretical which often includes an element of the practical, but secondly and more importantly, the hands on practical field work, where people put their basic skills and knowledge to the test. Over the years we have focussed on practical skills and we have run training courses in weed control and the use of herbicides, animal pest control and options, chainsaw work and off-road driving, these are essential being able to handle the work that we do. However while they do give you the basis for doing the job, they do not equip you for the reality in the field. Skill is only built up over time with hands-on practise and expert supervision. We are fortunate here to have two experts, Tania and Julian who are knowledgeable about our native biodiversity. Additionally we have support provided by BOPRC when new weed species appear or we have some other problems to solve. We are

continually shocked to see that lack of knowledge some contractors have, especially on the botanical front.

Spartina Control

In October 2013, we did an aerial survey of both Maketu and Waihi harbours, checking for spartina (*Spartina anglica*), also known as common cordgrass. This invasive grass was introduced to Maketu Estuary 15 or 20 years ago in an effort to reclaim some of the estuary for grazing. We found significant amounts in Maketu Harbour, but none in Waihi Harbour.

In Maketu Harbour spartina was most in evidence along the southern margin and up to the sportsfield, where it was first introduced. It had also spread right up to Fords Cut and along the southern side of Papahikahawai Island. Interestingly along much of the southern margin, it was being held in check by cattle grazing it. Two years ago the stopbank was fenced off and the spartina really took off so that in areas where there had been just a small fringe of short stems, there was now a metre or two of luxuriant foliage.

MOWS was given the spartina control contract, because we had both the terrestrial and marine options for dealing with it. So while about 75% of the work could be done from the stopbank or from Maketu Road, the rest needed to be done by boat and our trusty punt, Speedy Gonzalez came into its own as it could easily carry three crew and 200 litres of herbicide mix.

The job (which was EPA approved), had to be done within a short timeframe, early December through end February, and avoiding the main holiday period. On top of this we needed a good spring tide for the boat operation, no rain and little wind. We also needed to fit in a follow-up spray as some plants always survive the first spray, due to spartina being rhizomatous, ie. it spreads underground as well as by seeds. Rhizomatous plants are always much harder to deal with than normally rooted plants and we knew from dealing with it on the beach of the Maketu sportsfield, that it needs several doses of the grass-specific herbicide, Haloxypop, to ensure its long-term demise.

So an initial spray was done in early December, with the follow up sprays in late January though to late February as the weather and tides allowed. In general we got a good kill rate, but there are a couple of areas where the property owners were not keen on the work and they wanted planting done to avoid the possible risk of erosion resulting from the loss of the protection that the spartina affords. To help on this front we planted 2000 or so rushes in amongst the sprayed spartina. This year we expect to continue the job with another follow-up spray, as well as an area in the saltmarsh where the spartina had been covered by a thick layer of flotsam which prevented our being able to spray it this year.

Papahikahawai Island

Papahikawai Island is made up of two areas planted in 2016 and 2017, a chenier bund that surrounded the harbourside of the island, and the paddocks that were previously grazed. MOWS was awarded a weeding and maintenance contract in September 2017. The contract was for control/maintenance of Gorse, Black Berry, Boxthorn, Cape weed, Lupin, Kikuyu, Pampas and Paspalum, The contract also involved releasing of previously planted areas from 2016 and earlier in 2017. Each area collectively had close to 15,000 plants.

All of the above weeds occurred in high densities across the whole island. Kikuyu was the most abundant of these weeds. Many of the plantings were slowly being suffocated by kikuyu so continual control using Haloxy was required throughout the year. Gorse and Lupin was also prevalent throughout the island. The chenier was exposed to high densities of both, especially

close to the summer months when a quite intensive session of control was needed which included hand pulling of lupin seedlings. All weeds appear to be under control at the time of writing, but with summer approaching, more work will be needed to aid in the eradication of weeds.

We were also involved in several gate building contracts on the island. The main purpose of the gate installations was to prevent unauthorised vehicles from entering the island. This was largely unsuccessful though as many people still gained access to the island for fishing.

Kaiate Falls and Midway Park Wetland

MOWS was approached by Sue Hammond of the Western Bay District Council to see if we could assist in a weed management programme at both sites. Kaiate was infested with gorse, tradescantia, asparagus fern, blackberry and Spanish heath.

We spent quite a long time clearing gorse which had almost 10cm in diameter trunks in some places. The majority of the gorse required cutting and pasting. Tradescantia was prevalent throughout the lower sections of the path down to the waterfall. This was controlled using a Triclopyr spray which does not harm grass.

Asparagus fern also occurred throughout the park. This was dealt with by hand pulling and removing the tubers, as well as, by cutting and pasting. Spanish heath only really occurred in one area of the park and for the most part has been controlled. Pampas grass also occurs in Kaiate but in much lower densities and has been dealt with, but like most weeds, will need a follow-up.

Midway Park wetland in Pukehina, has been a project of Sue's for nearly 10 years. We were asked to do occasional maintenance on invasive weeds. The wetland has a low density of blackberry but much higher densities of invasive grasses. So far, we have carried out one session of spraying to control invasive grasses in the wetland and one planting session. We expect that both Kaiate and Midway will be ongoing contracts for MOWS

Whakapoukorero Wetland

Whakapoukorero has been a difficult contract to manage. Weed control was pretty much stopped in summer when our contract ended (right when continual control was needed the most). We saw the return of high densities of pampas, gorse, Inkweed, blackberry, honeysuckle and kikuyu. We were then asked to assist with weed control again in April 2018. For the most part, MOWS seem to have done a pretty good job in the control of those weeds around the ponds though it was very apparent, that when you use herbicides very late in the growing season they take a very long time to take effect.

Other Contracts

We have also had several other contracts from the Regional Council and other groups. These include the laying feratox poison in Aongatete Forest, planting contracts and the tightening of the nuts, all 550 of them, on the bridge connecting Maketu Spit to Papahikahawai. These have further added to our capabilities and strengthened relationships for MOWS. We expect to gain more contracts as time goes on to further develop our capabilities and build our reputation as a professional organisation.

Environmental Education Programme

The aim of the MOWS education programme is to encourage young people to become kaitiaki for their local environment, through enjoyable classroom activities and field trips. We help the students to be of “service to the community” through restoring the local ecology and creating artwork to showcase to the community. Each term is based around a theme (fresh water quality and native fish; shorebirds and estuary habitats; rocky shore ecology; the importance of dunes) incorporating one in class lesson (with hands on activities), one field trip and one follow up art/public awareness campaign or research based lesson.

We are grateful to Western Bay of Plenty District Council for their ongoing support of our Environmental Education Programme at Te Kura o Maketu, Paengaroa School and Te Puke Primary. We are pleased that Baytrust, Maketu Rotary and Kiwi coast Lions Club came on board this year with additional funds. As a result we have been able to run the full programme for Te Puke Intermediate as well as tailored education units for Te Puke High School, as well as, Pongakawa, Te Ranga and Pukehina Primary Schools.

The programme is free for schools including transport costs. We cater the programme to each school according to their needs and the way in which they operate. We strive to make it as easy as possible for the schools to work with us with clear communication and easy to follow curriculum links.

Why is this the right thing to do?

Our programme includes low decile schools. These students are often from rural areas and comprise many different ethnicities. These students have had few opportunities to engage with environmental science in a meaningful way prior to joining the programme. We think it is important for all children to have an understanding of how the environment nurtures us and how their actions can affect these natural values in a positive way. We aim to build a sense of belonging to their community which will hopefully foster other positive behavioural attributes.

The education programme has been a useful vehicle in helping us engage more closely with the local community. Through building relationships with the students and their parents the community are starting to become more appreciative of what Maketu Ongatoro Wetland Society has and will continue to achieve with their support.

Activities in the last 12 months

Term Four 2017

We ended the 2017 on a high note with three field trips to Maketu Estuary. Each day started with a rock pool discovery walk in front of the surf club. Students had completed research projects in class the week before, studying the adaptations species have to live within different zones on the tidal shore. We had a BBQ and prize giving at lunch time to acknowledge those students who were particularly engaged in the programme this year.

After lunch we joined Elaine Tapsell from Maketu Taiapure Trust to conduct a study of shellfish beds in Maketu Estuary. This is an ongoing study conducted in November every year to assess the size and distribution of pipi, tuangi/cockles and other kaimoana in the estuary. Students had to complete a haphazard survey using a quadrat placed every 5m along a 30m transect line. Every living thing on the surface and down to 10cm depth was recorded and measured along with tide and weather conditions. This data is going to be vital to assess the changes in shellfish

abundance and distribution once Ford's Cut is widened in 2018 allowing more fresh water in to Maketu Estuary from the Kaituna River.

"I liked learning about the different rocky shore creatures, such as how the starfish empties its stomach inside out to eat the bivalve mussels" Cameron, Paengaroa Primary.



Top left – Collecting sample from quadrat with Te Puke Primary. Middle – Recording data with Paengaroa School. Top right and Bottom Right - Counting pipis.



Rock pool scavenger hunt with Te Kura o Maketu at Okurei Point (Photos: Tania Bramley).



*Top left – Prize winners from Te Puke Primary. Top Right – Paengaroa School.
Bottom photo – Acknowledgement of seniors from Te Kura o Maketu who have gone through 3 years on the programme.*

Term One 2018

To start the year students surveyed the water quality of streams flowing in Maketu and Little Waihi Estuaries. Te Puke Primary students from the Ngakau mahaki unit started the year with a mini-bioblitz of the Ohineanganga Stream which runs through Te Puke and flows in to the Kaituna River. The students found macro invertebrates in the stream and had to work out whether their presence classified it as being a healthy habitat. Results indicated that the stream is of moderate health though impacts such as horticulture (within 2m of the bank up-stream) and a lack of vegetation on the stream banks causes elevated nitrate levels and sedimentation during rainfall.

Te Kura o Maketu students surveyed the water quality of the lower reaches of the Kaituna River and compared it to the water in the “by de Ley” wetland and the farm drain next to Ford Rd. The levels of nutrients within the Kaituna River were at the same level as the farm drain showing elevated Nitrogen (2mg100l). Within the “by de Ley” wetland the nitrogen levels were at almost zero due to the filtering properties of the wetland plants which absorb nutrients from the water. The students also used a water clarity tube to assess the amount of suspended sediments in the water, the farm drain beside Ford Rd had 25cm clarity, showing an extremely poor result. The

water in the “by de Ley” wetland ponds showed 90cm clarity. This highlighted the importance of wetlands for cleaning water before it flows into our estuaries and out to the moana.

Paengaroa School surveyed the upper reaches of the Kaikokopu Stream at Redwood Valley Farm, learning about what lives in this beautiful environment. Students found 1m+ water clarity along the bush clad stream and water invertebrates which are only able to survive in healthy rocky streams. This was followed by a lesson in class whit satellite images to look at land use along the stream. They were surprised to see the highly modified farm and orchard environments downstream. We also talked about the impact of cleared forestry in the area, and exposed soil on hillsides and streams with no riparian planting which results in top soil washing in to the streams and out to sea. Since the removal of more than 95% of our lowland wetlands, there is nothing left to filter the water. This has essentially created straight drains which flush everything straight into our estuaries.



From left: Ngakau Mahaki students from Te Puke Primary surveying freshwater invertebrates, Paengaroa School students with an endangered long fin eel, and surveying phosphate levels.

WETLAND LIFE

Wetland Facts

The wetland is home to beetles, bugs, insects and other animals. Most swamps, rivers, lagoons and wetlands are home to 90 different species of birds, 42 of NZ's 42 native fish and threatened plants are from our wetlands.

Australasian bittern, Whio, Paradise shelduck, and Pukekos are all birds that have needed to adapt to living in wetlands.

Over half of NZ's wetlands have been destroyed and we have lost over 100,000 acres of wetlands every year.

Life Cycle of an Eel

Lifecycle of a Galored

By Ani, Paengaroa School

The Eco Learning Unit from Te Puke Intermediate are new additions to MOWS programme. They surveyed the lower reaches of the Kaikokopu Stream and the Wharere Canal flowing in to Little Waihi Estuary. The site was at the Waihi Harbour wetland which is the newest restoration project for MOWS. The wetland provides habitat for critically endangered Australasian Bittern as well as Pied Stilts, Teal and Royal Spoonbills. The students also found endangered longfin eels. Water quality tests showed elevated level of nitrates in the canal water. This is not surprising giving the highly modified catchment which includes over 100 farms upstream.

Each School wrote submissions to the Western Bay of Plenty District Council Long Term Plan, outlining their study and how they believe we need more resources to go in to restoring wetlands in the lowland Pongakawa and Te Puke areas. The students also created science posters for display at the Te Puke Library and MOWS information stalls at local events.



Library display showcasing posters and WBOPDC LTP submissions following mini-bioblitz.

Term Two 2018

Students from our core 3 schools learnt about the impact of plastic rubbish on our oceans and completed a study of our rocky coastline. Paengaroa School were also lucky enough to hear from a visiting geologist about the volcanic history of the rocks found around Okurei Point.



Paengaroa School students looking for obsidian flakes in the volcanic rocks at Okurei Point.

Rock pool scavenger hunts are one of the student's favourite field trips each year; we never know what strange organisms we will find. Each creature on the rocky shore has special adaptations which help them survive in a very harsh environment. Students studied these adaptations for research projects as well as collecting plastic and natural items to create artworks in class to showcase their learning for the Te Puke Library display.



Library display showcasing rocky shore ecology posters and learning focused on the impact of plastics and micro-plastics on sea life.

Additional Schools

We collaborated with the Coastal Restoration Trust to trial their new dune vegetation sampling technique with Te Puke High School students. A total of 180 Year 10 students surveyed a section of the dune on Maketu Spit. We were approached by the maths department at Te Puke High School and were excited to plan a field trip where students could collect real life data to use in their classwork. It was a pleasure to collaborate with the Coastal Restoration Trust and Coastcare who provided plants for a dune planting activity alongside the vegetation sampling.



Year 10 students from Te Puke High School surveying dune vegetation at Maketu Spit.

Te Puke Intermediate Eco Unit completed a dune restoration unit with a planting day at Maketu Spit, supported by Coastcare. One student found a pipefish, which has been donated to MOWS shell collection.



Te Puke Intermediate students restoring the dunes at Maketu spit.

MOWS also worked with Pongakawa School to run a bio-blitz at their wetland for the entire School. We ran one full day of in class learning with four x 1hour rotations of 60 kids. Showcasing taxidermy animals/bird adaptations and familiarising students with the water quality sample kit. This was followed by a field trip day where our education team ran heaps of activities for every

class in the school. 1. Water invertebrates 2. Water quality testing. 3. Pest animals that impact our wetland and forest birds. 4. Invertebrates that live in our forests. 5. Fresh water fish. These kids are so lucky to have such a neat forest and wetland at their school. The Pongakawa Wetland team do such an amazing job of keeping the forest free of weeds and pest animals.



Top: Pongakawa School students surveying water clarity, bottom left: Freshwater invertebrates, bottom right: Forest invertebrates.

Term Three 2018

MOWS core programme was all about the impacts of humans, pests and grazing animals on the coastal dunes systems of the Bay of Plenty. The emphasis was on how people contribute to erosion of the beach and thus endanger the wildlife that lives there.

Students started with a lead in class lesson to talk about the importance of dunes for protecting the land and providing habitat for skinks, invertebrates and endangered shore birds. Te Puke Primary Schools Ngakau Mahaki Unit spent a sunny day at the beach in Mount Maunganui (Maketu Spit was closed due to the re-diversion project). Students prepared a site by weeding the dunes and competing to see who could get the biggest pile of pest plants. They then planted more than 150 sand binding plants called pingao. The students then sang a beautiful waiata for Tania and Chris Ward from Coastcare who organised the dune planting.

Te Kura o Maketu spent had to make two attempts at their planting day at Newdicks, after an unexpected shower came through and soaked all the juniors on their first day. Our second attempt was a sunny morning where students were able to plant sand binding plants in front of the car park and down the beach towards Little Waihi end. We found a big sand scarab beetle larvae.

90 students from Paengaroa School continued their good work at Pukehina. They saw how well last year's plants had grown to fill in a blowout caused by motorbikes.



From left: Paengaroa School Students planting dunes in Pukehina, Maketu Kura at Newdicks Beach and Te Puke Primary Students pulling weeds at Mount Maunganui.

As part of a public advocacy campaign students from each school are designing dune protection posters. Three posters from each school will be printed on ACM boards for display at NZ Dotterel breeding sites in Maketu and Pukehina this summer.

This term of education would not be possible without the support Bay of Plenty Regional Council Coastcare.

Additional Schools

Tania and Julian had a productive class session with Te Puke Intermediate; the students were put in charge of planning a planting project for Waihi Harbour Wetland at the same site they surveyed during their bio-blitz in Term One. First students calculated the area of the site and split it in to 7 sections for each group to work on, then researched the plants that would work on the site. Each group researched 2 plants and presented back to the class on whether they would be suitable for the site. They had the difficult task of deciding which plants to use according to the height they grow to. This was all within a mock budget which took in to account the price of plants, compost, fertilizer and plant guards. Stage two involved going on site and digging holes for 300+ plants.

Special thanks to Janie Stevenson from NZ Landcare Trust who came and tested out the new SCHMAK water quality testing kit. We even also a film crew on site filming a video clip for the launch of the Bay Conservation Alliance.



Te Puke Intermediate students researching plant species for Waihi Harbour WMR.

We also ran a rocky shore and impact of plastic unit for Pukehina School and a dune ecology unit for Te Ranga School; a great way to get to know two new schools.



MOWS education team: From left Jamie Moko (invertebrates and flora), Peter Ellery (wetlands and native fish), Jenn Shephard (bird anatomy and freshwater inverts), Tania Bramley (programme leader, marine biologist), Carolyn Symmans (Queen rat trapper). Missing: Maureen Burgess and Julian Fitter.

Events and promotion

We continue to expand our community reach through attending events and with a strong social media presence. We are now over 500 Likes on facebook and regularly post stories. Our membership Officer Claire Garland also re-vamped MOWS website and flyers. We had 8 newspaper articles, monthly Mai Maketu updates and stalls at Te Puke A&P show, Maketu and Te Puke Community Markets, the Maketu Showcase event and education displays at Te Puke Library. Tania, Julian and Carolyn have given talks at Maketu Rotary, WBOPDC meetings and parent events at Schools. Tania also co-hosted a workshop about Environmental Education with Michelle Elborn (from BCA) at the Regional Environment Network – Care Group Conference.



Top: Activities at the MOWS stall during the Te Maru o Kaituna River Celebration. Bottom: MOWS members from Left: Claire Hartley (Membership Officer), Tania Bramley (Secretary and Education Coordinator), Will Anaru (External Contracts Manager), Carolyn Symmans (Queen rat catcher), Sheelagh Leary (botonist and Julian's partner), Julian Fitter (MOWS Chair) and Peter Ellery (Wetland Specialist).

Volunteering and Membership

We have 52 members signed up to MOWS and paying an annual membership donation. We also have 11 life members, thank you to everyone who is making a contribution to MOWS cause. In addition to being a registered charity MOWS has morphed in to a Social Enterprise aiming to employ and upskill local members to conduct the work on our private contracts and BMP's. However, the voluntary component of our work is always there, this year over 3000 volunteer hours were completed towards various projects by our core members and the public on working bee days:

Type of volunteering	Number of people	Hours
Management of membership	3	48
Sourcing funding	4	54
Accounting	4	99
Travel	10	312
Promotion - facebook, website, newsletters and articles	3	62
Events for promotion	8	79
Emails	14	420
Reports – education, annual MOWS, quarterly BMP updates	5	73
Set up and clean up on all work and education days	7	715
Education - support for field trip days	6	84
Machinery and workshop maintenance	3	45
Working bee days including prep and clean up	155	522
Biodiversity Monitoring	5	121
Trapping pests	2	312
Total		3028

Table 7: MOWS volunteering contribution 2017-18.

Submissions and community representation

- 4 x school submissions to WBOPDC LTP asking for more support for wetland restoration projects in the lowland areas of both Maketu and Little Waihi Estuary.
- Julian Fitter and Tania Bramley are both Board members for Bay Conservation Alliance. Claire Garland is MOWS membership secretary (Vol.) and works for BCA as the admin support person.
- Julian is a member of the Smartgrowth Environment and Sustainability Forum.
- MOWS made a significant submission to the Te Maru o Kaituna River Document; several of our recommendations were accepted.
- Julian is on the Kaimai Mamaku Forest Ranges Biodiversity Project Group (first meeting 8th Nov)

Member Training, Courses and Conferences

- Jennifer Sheppard a new addition to the education and monitoring team, went to Miranda Shorebird Monitoring Course.
- Laura Rae, the newest addition to our working crew, attended a 2 day Weed Busting Workshop for Trainers run by QEII trust.
- In November 2017 we ran a field trip for the Coastal Society, highlighting some of our work.
- Members updated their First Aid Certificates thanks to Envirohub Bay of Plenty.

Plans for the future

Maketu Ongatoro Wetland Society are founding members of the Bay Conservation Alliance (BCA). We worked with Otanewainuku Kiwi Trust, Aongatete Forest Restoration Trust and Uretara Estuary Managers Inc. to establish the organization. Since then two other groups have joined us: Te Whakakaha Trust which looks after the Hoschstetter frog area on the Papamoa Hills, and Friends of the Blade who are part of the Whakamarama Community group.

The purpose of the new organisation, which is also a registered charity, is fourfold:

- To provide support on the administration, operation and management side of members businesses to help them to be more efficient and sustainable.
- To help to increase the number of projects and to develop landscape-scale projects
- To develop a bay-wide, structured, environmental education programme.
- To provide a voice for our wildlife.
-

BCA has already started working to standardise our accounting procedures, not easy at first, but we are getting used to it. We are hoping that they will soon be able to employ an Operations Officer who will start to provide management support.

We would like to continue to work with the new schools introduced to the programme this year, as well as broadening the scope of the programme by collaborating with other environmental groups through the Bay Conservation Alliance. Tania looks forward to working with Brian Ireland, the newly appointed BCA Nature Education Facilitator to build the Maturanga Maori component of all MOWS education units.

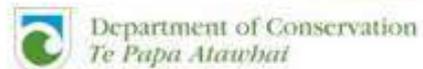
The plan is to build MOWS External Contracts unit up over the coming year to actively look for private contracts, with the long term goal of financial sustainability for our organisation.

Acknowledgements

Many thanks to our dedicated committee, highly skilled work and monitoring team, awesome volunteers, schools and the community for putting in the work to help restore the eco-scape we live in. We would like to acknowledge the council and DOC staff who support us including: Chris Ward from Coastcare, Milly Farquhar, Richard Lyons and Pim de Monchy from BOPRC, Glenn Ayo from WBOPDC and Karl McCarthy and Gavin Smith from DOC. The work we do would not be possible without the support of all of our sponsors listed in the next page.

We hope you enjoyed reading this report, thank you to everyone who contributed time and photographs.

Funders & Supporters



Funder	Contribution towards
Bay of Plenty Regional Council	All 4 Biodiversity Management Plans (BMP's) and external contracts
Western Bay of Plenty District Council	BMP's, external contracts and education (3 main schools)
TECT	MOWS gear shed
Bay Trust	Education and administration
One Foundation	MOWS gear shed
Trevelyan's Pack and Cool	General funds
Department of Conservation	BMP's and taxidermy of matuku/Australasian bittern
Forest and Bird Te Puke	Newdicks BMP
Maketu Rotary	Education
Te Puke Kiwi Coast Lions Club	Education



**WILDLIFE CONSERVATION / RESTORATION / EDUCATION
ECOLOGICAL MONITORING / COMMUNITY ENGAGEMENT**

