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Shorebird Roost Rehabilitation at Stockton Sandspit

Report of Volunteer Effort for 2008 and 2009

Annual Report – Appendix D

The shorebird roost rehabilitation effort by Hunter Bird Observers Club volunteers at Stockton Sandspit continues to achieve wonderful outcomes for shorebirds in the Hunter Estuary.

The prime focus of this restoration work has always been about the shorebird roost and over the last two years all objectives towards that end were met. Secondary focus follow-up sweeps for target weeds continue and each year get completed in record time.

This report attempts to chronicle the achievements of the dedicated volunteers that do the good work, celebrate some amazing highlights and discuss various challenges that need to be met.

Core Focus Areas

Mangroves

A renewed licence from Fisheries “*to harm marine vegetation by removal of mangrove seedlings at Stockton Spit*” was received by National Parks & Wildlife Service (NPWS) 23rd January 2008 and remains valid through to 20th January 2013. A full copy of the permit is held by Tom Clarke and carried to site on each occasion. Mangrove seedlings were removed from all affected areas during January and sometimes February of each year. This work is completed in short time these days and only 7 hours of work has been required over the last two seasons.

By far the majority of seedlings dealt with are Grey Mangrove (*Avicennia marina* var. *australasia*) but during the February 2008 sweeps several River Mangrove (*Aegiceras corniculatum*) were found sprouting in the Dog’s Head area. These seedlings were all confined to the Dog’s Ear section which really is the beginning of a channel through the Great Saltmarsh to Levee Pond. There exists a very nice stand of River Mangrove

immediately off the Levee but the journey is quite circuitous for the seeds of these plants to be deposited inside.

Grey Mangroves are the major pioneers of shallow tidal areas in the estuary and flower from February through to June. Well developed seeds drop from the trees as early as October and can still be added to the system during December. The action of tides and currents transport these propagules to areas of calm waters where the seasonal invasion repeats itself.



The vast majority of seeds are deposited on the beaches where they pile up as rack along the high tide mark. A considerable knock-down rate is observed here with literally thousands of these seeds dieing before striking.

On the other hand, seeds deposited within the saltmarsh seem to flourish. By January the new seedlings are developing well in patches within the saltmarsh areas, on top of the “green weed” within the Lagoon, along the high tide mark of the beaches and over mud flats where currents are slow. Occasional winter storms (June and October) can strip trees of underdeveloped seeds that fail to strike.

River Mangroves mostly occur within the tidal creeks of the estuary but can also be seen on the landward side of Grey Mangroves in back waters. One such stand occurs just east of the Levee where direct comparisons between the two species can easily be made. This plant flowers in late winter and early spring and its clusters of nectar laden flowers are attractive to Brown Honeyeaters and bees. We have only found seedlings of this species sprouting within the saltmarsh.



Golden Plover Point, Shelly and Big Island

Clearing these areas is usually viewed as the Great Winter Effort. From May till August there is much less chance of disturbing migratory shorebirds so the effort to prepare these areas for the next season is made during this time. An analysis of the volunteer hours spent during this time over the last two years reveals that 61% (504.5hrs of 827hrs) of our time at the sandspit is needed to prepare shelly sand.

Golden Plover Point continues to develop into an interesting ecotonal marsh lying between two saltmarsh areas. The month of April gives us enough time to remove all

the lacy ragweed from Golden Plover Point and Pelican Point. The Richard's Pipit has preferred the margins of Golden Plover Point for nesting over the last four seasons.

May and June are devoted to creating shelly sand over the area between the Berm and the Scrape. We persist in calling this area the Shelly. Creating shelly sand has been boosted in the last two years by the introduction of a hired rotary hoe. This work prepares the ground and does most of the chipping previously done by hand in just one day. Permission from NPWS and support from KWRP in hiring the machine have helped this process become a reality. Last year NPWS even supplied a field officer and a Ranger for the day to help drive the machine.



The rotary hoe used was an 8.5hp petrol motor driven, walk behind type that works well over firm sand previously cleared of marrum grass and beach evening primrose. The amount of physical work it has saved is tremendous but perhaps even the machine has limitations.

Over the last two years an appreciable amount of the sand has become relatively soft from all this tilling and the effort needed to drive the hoe over this soft sand places too much strain on the operator. During 2010 we will be reassessing the need for this machine as trials have already determined that weeds can be raked successfully from soft sand. It may well result in machine work being required only every couple of years or so.

The creation of shelly sand is ultimately completed with a big rake effort over all the tilled soil. As much vegetative material as possible needs to be removed to keep the sandy integrity in the soil and not create too much carbon load from decaying plant matter. This process obviously cannot continue for ever and signs of soil composition changes are starting to become apparent. As certain areas become less sandy it is our view that they should be allowed to generate into natural marsh areas dominated by Knobby Club-rush *isolepis nodosus*. This process will take many years but until then the creation of shelly sand by manual labour will certainly continue.



This raking effort is the most arduous of all the work at the Sandspit and weather conditions at the time are sometimes atrocious. Despite these cold, windy and wet conditions the work does get done in time for ground-nesting types to begin nest site

selection. It is common in the last couple of weeks of July that our work is under the supervision of prospective nest builders.

July is the month we take to raking Big Island and two visits is all it takes to complete. Big Island appears to be the prime site for ground-nesting types these days with 5 out of 11 Red-capped Plover nests and 4 out of 5 Pied Oystercatcher nests being placed there in the last two seasons. Note that at least one Pied Oystercatcher nest was placed on the Dykes across the river in that time.

While ever we have the commitment and desire we currently enjoy then this shelly sand creation will continue. It is very rewarding when later in the year we see stint, plover and sometimes sandpiper and knot roosting there. But of course our greatest joy comes when those amazing ground-nesting types successfully hatch and we are uncles again!

Salt Marsh

At the end of the winter effort and before the migrants start returning to the estuary, we comprehensively sweep all the salt marsh areas for the weed *juncus acutus*. These days the spike rush effort is nothing more than an easy walk over the salt marsh with a long-handled tool to dig out immature seedlings. There are no mature seeding plants now on the site.



For the rest of the time we have continued to watch the generation of salt marsh on the Scrape as nature and the tides do their thing. Since finally establishing the full suite of saltmarsh plants in February 2007 we have just sat back and watched this patch grow in density and coverage. Today there is little discernable difference between the Scrape and the previously established Saltmarsh Finger that lies adjacent to it.

The Scrape continued to develop with the influence of at least 48 high tides during 2008 (6.6% of the high tides) and a further 67 in 2009. This equates to a massive 9.2% of the high tides during 2009. The pulsating trend over the last four years is 2006 – 6%, 2007 – 7.6%, 2008 – 6.6%, 2009 – 9.2%. Another 9% year is predicted for 2010. Another area benefiting from the increased tidal influence is the Lagoon where the saltmarsh margins are becoming wider, most noticeably from the Weir around to the Hide.

Over other areas of previously established saltmarsh it is possible to see a decrease in the density of plants. Most notable are those areas once dominated by Salt Couch *sporobolus virginicus*. Being a plant of the upper tidal zone the increasing tides have thinned this species out opening up the community. Little Island was once a preferred nesting site for Richard's Pipit but the lack of dense couch now has meant that pipits are better suited in the margins of Golden Plover Point. It will be interesting to see if

these patches vacated by the couch are re-established with Samphire *sarcocornia quinqueflora*. An increase in the amount of Streaked Arrow-grass *triglochin striata* is also noticeable along the lines of greatest flow rates especially in the Lagoon.

Sweeps for woody weeds.

General sweeps for woody weeds over the non-roost areas start in August after the spike rush effort is complete. Our targets continue to be mostly telegraph weed and bitou bush but others are dealt with as required. The approach with the majority of these woody types is to simply pull them up and drop where they stood to break down and return to the soil. As we are pretty much only dealing with seedlings now this work represents a fairly relaxed walk over the follow-up areas.

The follow-up areas include all parts of the sandspit from the turn-off at Fullerton Road to the river as well as the fringe of habitat extending to Fern Bay. At the end of 2009 we declared the area bitou free as far as the Fern Bay bus stop opposite the shops and this is as far as we should manage in that direction. Work carried out by Newcastle Council staff in spraying bitou along the fringes heading towards Stockton should be a target for hand remove follow-up during 2010. This challenge has been looming for some time so since the primary treatment has been completed now the opportunity to make progress here is beckoning.

During the last two years at least 15 “new” weeds have been discovered and identified. Mostly these represent no great challenge to manage but highlight the continuing process of invasion that needs to be met sooner rather than later. The list of new weeds includes a couple of species that are regarded as priority that do need particular attention and ongoing vigilance to keep in check.

In January 2008 we were surprised to discover an outbreak of Chinese Violet *Asystasia gangetica ssp. micrantha*, a major weed of plantation crops overseas. It is not common in Australia but has been recorded as naturalised in the Tomaree area from 1999 and is listed as a reportable plant. Information regarding this outbreak was sent to the Noxious Weeds Officer at Newcastle Council and a subsequent herbicide spray treatment was carried out by Council staff.



This outbreak was mostly confined to the mowed margins of the Entrance Road but a small patch was found under the bridge associated with some dumped soil. Council

has confirmed that Chinese Violet is growing well in the lawns of many Fern Bay residents and along road verges of the Port Stephens LGA where contractors carry out mowing. Contamination of machinery and dumped garden refuse are likely vectors in spreading this weed.

Since the initial knock-down spray treatment, follow-up hand removal has been necessary to keep the situation under control. An immediate follow-up in February 2008 was carried out with a repeat effort in April then later in August and November as part of the normal sweeps. Plants overlooked by the sprayers or newly struck were carefully and completely removed from the soil, placed off the ground on some convenient structure and left to wither. This treatment has proved to be very successful.

Twelve months later in November 2009 another outbreak was discovered in an area higher up the bridge embankment and growing within the longer not mowed grasses. The discovery was only possible since the plant was starting to flower and was found while accessing the bank to remove some more obvious bitou. Again this outbreak was reported to Council and a subsequent initial herbicide spray treatment was carried out. The whole Entrance Road area requires a proper inspection each year when we undertake our sweeps.

Other weeds that could become a problem if left to establish include prickly pear, alligator weed, madeira vine and turkey rhubarb. All these species were carefully removed from the soil, bagged and taken away from site as a matter of course during the sweeps. The alligator weed only appeared after some flooding of the river in 2008 and since they were obviously not well established they were easily dug up. Further inspection during the 2009 sweeps could not find any trace of this weed.

The blight of all restorers is morning glory and for some time we have managed token efforts only in reducing the impact from it at the sandspit. Mostly this weed is growing over the ground and climbing into the mangroves from just east of the Stockton Bridge Car Park through to Fern Bay. Our efforts to date have been confined to that patch of ground from the Bird Hide to just past the Levee where we have concentrated on removing the creeper from the branches of the Acacias *A. longifolia* var. *sophorae* and from over the Pig Face *carpobrotus glaucescens* that is trying its hardest to compete on the floor.



A wonderful opportunity presented itself in January 2009 when a fire swept over this area and burnt out all the grasses and woody weeds.



With the cleared ground it was easy then to locate the “hearts” of each major morning glory plant and remove that part with the most potential energy. A sweep in February and another in April has cleared the ground of all large stems and roots. The second sweep in April allowed time for those overlooked to re-sprout again and give their location away before other vegetation had time to hide them. Subsequent inspections have failed to

locate further re-sprouts except for a large patch of castor oil plant that took advantage of the disturbance. These replacement weeds are much easier to deal with during the normal sweeps of the non-roost areas and will bow to the pressure of the grasses in time.

A challenge for the future is to seriously take on the task of removing morning glory at least from the canopies of the mangroves. This can be achieved by cutting stems down low and clearing the immediate ground about each tree as per our method with the shrubs. It will however be less of a priority than our other work and will be only considered if time and resources allows.

Schedule for 2010

The almost weekly visits to the Sandspit will continue as well as others on an as-required basis. However to highlight the Winter Effort and beyond to the membership of HBOC the following schedule has been posted. Note the slightly earlier than usual start to creating shelly sand and the absence of planned work for July. There will be work undertaken in late July but placing a date on these is difficult at this stage.

	Low Tide		Notes	Crew	Work Plan
April	Sunday 11th	12.58pm	10.00am start	Volunteers	Sweep mud flats and Lagoon for mangrove seedlings. Chip out tall weeds on Shelly and Berm Margins. Start ambrosia sweep on Golden Plover Point.
May	Sunday 2nd	5.38am	7.00am start	Core	Complete sweeps over Golden Plover point. Prepare Shelly and Big Island by creating shelly sand.
	Sunday 9th	11.26am	8.00am start	Volunteers	
	Sunday 16th	3.53pm	Late start	Core	
	Sunday 23rd	10.42am	7.00am start	Core	
	Sunday 30th	3.53pm	Late start	Core	

June	Sunday 6th	9.38am	7.00am start	Core	Complete shelly sand preparation
	Sunday 20th	9.14am	7.00am start	Volunteers	
July					
August	Sunday 8th	12.33pm	9.00am start	Volunteers	Sweep saltmarsh areas and chip out juncus acutus.
September	Sunday 5th	11.20am	8.00am start	Volunteers	Sweep non-roost areas for woody weeds etc.

Ground-nesting Birds

Despite the shorebird roost restoration focus of our work at Stockton Sandspit no report can be complete without mention of the ground-nesting birds. In particular the breeding successes of Red-capped Plover and Pied Oystercatcher have brought an added bonus to the value of the sandspit not to mention the joy and satisfaction to the restorers.

Pied Oystercatcher

In recent times a pair of Pied Oystercatcher has moved to establish themselves a territory and attempt breeding in the estuary. Scanning the field notes and gleaning information from other sources it is evident that several breeding attempts have taken place since at least 2003. This can be assumed by sightings of copulation taking place at the Sandspit in August 2003 and again in October 2004. The success or otherwise of these attempts is not properly known however records of adults with dependant young seen on the Dykes in early 2004 and a bird sitting in October of that year more than suggest active breeding. In 2006 a pair of adult birds were seen with a dependant youngster occasionally through March and April at the Sandspit but ended in May with the discovery of a dead juvenile. In October 2007 the pair finally sat down on Big Island and successfully hatched a single chick.

So 2008 began with the continued caring for this youngster until “independence day” in March when the parents began to kick junior out. This process of actively driving the immature bird off the Sandspit continued for the duration of 2008 and still persisted on occasion throughout 2009. Despite the energy involved in repelling the previous offspring two breeding attempts were made later in the year. Copulation was observed in September and 6 days later our birds were sitting again on Big Island. The brooding only lasted 7 days and the nest was abandoned shortly after an amazing day of energy sapping repelling of the immature bird. Two weeks later in October copulation was again observed but no nesting this time at the Sandspit. It was a couple of months later that these birds were sighted again so perhaps laying, brooding and possibly hatching did take place but over on the Dykes. If that happened then failure surely was the result as the year ended with the pair defending the Sandspit area without youngsters.

Three breeding attempts by the Pied Oystercatchers can be accounted for in 2009. Copulation was observed in August at the Sandspit before the birds went absent for over a month however reports of brooding oystercatchers on the Dykes confirmed the whereabouts of the pair. This attempt failed and in early October our birds were sitting on Big Island for the third time ever. Brooding lasted for the full term but ended in failure when it is assumed predation of the newly hatched occurred. Despite the setback, this resilient pair tried once again and were observed sitting on Big Island just two weeks later. Success followed and in early December a pair of chicks was hatched. These oystercatchers are showing clearly now that they are well established and have properly adopted the Sandspit as a place to breed and rear young.

Red-capped Plover

Red-capped Plover nesting continues to be strong at the Sandspit and the last two years have produced the greatest success rates we have been able to determine. Since 2003 we have recorded 56 individual nesting attempts with 36% of eggs successfully hatching.

Red-capped Plover breeding success at SSS

	Nest attempts	Eggs hatched	Dependent	Independent
2003	4	25%		
2004	15	23%	20%	7%
2005	7	29%	14%	14%
2006	10	10%	10%	
2007	9	55%	44%	17%
2008	3	100%	100%	50%
2009	8	60%		
Total	56	36%	21%	10%

Counting eggs hatched is fairly easy but determining success of dependent and independent youngsters needs a lot of observations coupled with some deductions and logic. Even without properly knowing each individual (they all look alike) the progress of each can be monitored to some extent through to independence. As each hatching is mostly staggered it is possible to ascertain who is who by the rate of growth of each individual and while they remain in the care of parents. After becoming free of parents, the immature birds do prove difficult to keep tabs on. The table above represents the



results of all our observations, calculations and logic based on having a weekly presence at the Sandspit.



Observations are made while restorers work out on the roost areas, by scanning the area with telescopes from known vantage points and also by walking transects. These transect walks are designed to capture defensive behaviours and therefore locate nests and/or hidden runners. This establishes numbers and locations of nests and later helps track the progress of runners. As each nest is located it is noted on a map and a distant viewing point is then established to monitor the progress of the brooding. Most of the courtship behaviours including nest site selection and nest scrape preparation are recorded while carrying out that component of restoration works we call “shorebird observations”.

With the arrival of breeding Pied Oystercatchers on the scene these transect walks have been limited as we do not want to add to the list of disturbances endured by these new birds while brooding. Note that entries of dependent and independent birds have not been considered for 2009 since the double breeding attempt by the Pied Oystercatchers has made observations more difficult and open for unacceptable error. The point was made clear during the two week break between oystercatcher breeding attempts when we found nests and youngsters that we had not been aware of during the previous 4 weeks. Putting things into perspective, although our ability to monitor the Red-capped Plover is diminished during these oystercatcher brooding times, we certainly have established that these ground-nesting types enjoy the habitat we are providing.

Flora of Stockton Sandspit

The list of plants (see Appendix A) encountered at the sandspit continues to grow as we discover and identify more. A total of 120 species is listed at present with only 34 (28%) considered endemic native. At least 16 of these natives have been planted at the site while the majority of the remainder are those plants of the estuary associated with either mangrove forests or coastal saltmarsh communities.

The greatest representation (72%) in the list falls to the exotic plants, however less than half of these are actively managed in any way. There are about 14 species that are considered priority weeds and are dealt with on most occasions when encountered. A further 21 weeds are less targeted and only dealt with in nominated areas. The task, indeed the need, of taking on a purely weed focussed effort is not prescribed here. Weeds are treated only after considering their impacts to the habitats being restored or our obligations to the Community as required by legislation.

Having created the list a few years ago I have now embarked on a process of confirmation of species. To do this I need to once again recognise the species,

positively identify from either sample or photo and confirm by rigour of various text books and other resources. As each species is confirmed I have highlighted the entry by the use of bold type. In some cases where species have not been positively identified I have reduced the specific name to that of sp. while in others that I have confidence in but have yet to confirm I have left the species name in as is. This process is ongoing and only happens really when time and interest permits.



This Pig Face look-a-like is difficult to identify until it flowers. Comparisons can be made of the leaf colour and cross-sectional shape but as it has only appeared twice in the last seven years it is best to positively identify before treating. The species is *Carpobrotus edulis* and was used as an erosion control plant in stabilising dunes. It has since become naturalised locally. Treatment has been carried out immediately once its identity has been confirmed.

Another weed species that requires flowering before identification is the beautiful perennial herb *Gaura lindheimeri*. It is in the same family as the evening primrose that we dig up out on the Scrape and most likely turns up at the Sandspit as a garden escape. There is no immediate need to treat this plant however.



I have plenty of pictures of mystery weeds waiting for plants to flower or seed so that identities can be confirmed so where my botanical knowledge and access to particular references remains limited we will most likely keep them in the mystery plant category. Those species must therefore remain as potential additions only and are not listed.

Volunteers

The volunteer effort for the last two years shows a continuing downwards trend. Since 2004 when over 70 hours per month were being clocked up the effort each year has been dropping gradually to about 30 hours per month. This trend tells us more about the required effort than the willingness of volunteers however. The need to keep up regular visits is important but outside the winter months these visits tend to be shorter as work is completed fairly quickly.



As previously noted, the largest requirement for volunteer hours is the Great Winter Effort and this work has featured a spike of additional help both in 2008 and 2009 from the KWRP volunteers “Koora Gang”. The second Sunday in May has seen masses of these volunteers descend on the site for a morning of planting. Some additional Shelly clearing has been incorporated into these visits and is much appreciated. It continues to be the hardest time of the year to attract HBOC volunteers; a much greater effort in selling this to the membership is necessary.

At the end of 2009 an amazing 3,500 volunteer hours have been recorded since April 2003 and this equates to over \$60,000 worth of work-in-kind. Of course there has been other days previous to that when mangroves were removed or bitou bush was dug up and who knows what the real total is if we included all the Clean Up Days since 1996. Anyone who has been involved over that time should be proud of their contribution.

Our annual Clean Up Day continues to draw some non-birding people from the neighbourhood and a total of 14 “locals” have added their energies too over the last two years. And a Conservation Volunteer Australia person has decided to get involved in restoration works in the last six months.

The simple medium-term objective of this project is to keep up the on-going maintenance of the roost areas. This may appear to be an easily achievable goal but will be totally dependent on volunteers with passion and commitment. There is always plenty to do and while some of the work is challenging, no one is expected to perform outside their comfort zone.

Taking breaks to carry out shorebird observations is not compulsory but actively encouraged as these observations tell us a great deal about the nature of the site. In any case the sandspit continues to offer plenty for the patient birdwatcher.

Acknowledgements

Over the last two years we have enjoyed an increased site presence and general availability from the National Parks and Wildlife Service. This may be due to the establishment of a local office and the appointment of a Ranger to the estuary but I would also suggest that the interest and support from Jo Erskine has been a major factor. Thanks to Jo for organising fence repairs, support for and providing help with operating rotary hoes, facilitating signage alerting people of the brooding oystercatchers, a renewed mangrove licence and for physically helping with some of the restoration.

The continuing support from Kooragang Wetlands Rehabilitation Project staff is also acknowledged. KWRP has borne the costs of hiring the rotary hoe, organised massive volunteer days and supplied loads of tubestock for planting. In particular our thanks to Peggy Svoboda, Rob Henderson and Terry Sullivan are recorded here.

Newcastle City Council has become supporters of the Sandspit through several rubbish collections and occasional spraying of noxious weeds and the timely efforts of Kevin Folpp need to be acknowledged.

For their efforts throughout the last two years I need to thank the following HBOC members; Robert McDonald, Caryl & Paddy Lightfoot, Chris Herbert, Liz Crawford, Margaret & Keith Woods, Judy & Tony Iveson, Marj Kibby, Tasman Willis, Elaina Casey, Rachael Russel, Penny Drake-Brockman, Julie Maidment, Micaela McRae and Melva Fisher. In particular, I need to acknowledge the contribution of Robert for his continued support and commitment over that period.

Tom Clarke
January 2010.



Appendix A – Flora of Stockton Sandspit (As of January 2010)

Having created the list a few years ago I have now embarked on a process of confirmation of species. To do this I need to once again recognise the species, positively identify from either sample or photo and confirm by rigour of various text books and other resources. As each species is confirmed I have highlighted the entry by the use of bold type. In some cases where species have not been positively identified I have reduced the specific name to that of sp. while in others that I have confidence in but have yet to confirm I have left the species name in as is. This process is ongoing and only happens really when time and interest permits.

Dicotyledons

Acanthaceae

Asystasia	gangetica*	ssp. micrantha	chinese violet
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Aizoaceae

Carpobrotus	edulis*		hottentot fig
Carpobrotus	glaucescens		Pig Face
Galenia	pubescens*	var. pubescens	galenia
Tetragonia	tetragonioides		botany bay greens

Amaranthaceae

Alternanthera	philoxeroides*		alligator weed
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Apiaceae

Foeniculum	vulgare*		fennel
Hydrocotyle	bonariensis*		Kurnell curse

Araliaceae

Schefflera	actinophylla*		umbrella tree
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Asclepiadaceae

Gomphocarpus	fruticosus*		narrow-leaf cotton bush
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Asteraceae

Ambrosia	tenuifolia*		lacy ragweed
Anthemis	cotula*		stinking mayweed
Arctotheca	calendula*		capeweed
Aster	subulatus*		wild aster
Bidens	Pilosa		cobblers pegs
Chrysanthemoides	monilifera*	ssp. rotundata	bitou bush
Conyza	sp.*		fleabane
Cotula	sp.*		carrotweed
Gamochaeta	sp.*		cudweed
Heterotheca	grandiflora*		telegraph weed
Senecio	madagascariensis*		fireweed
Sonchus	oleraceus*		sowthistle
Tagetes	minuta*		stinking roger
Xanthium	occidentale*		Noogoora burr

Avicenniaceae

Avicennia	marina	var. australasica	Grey Mangrove
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Balsaminaceae

Impatiens	wallerana*		busy Lizzie
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Basellaceae

Boraginaceae	Andredera	cordifolia*		Madeira vine
Brassicaceae	Heliotropium	amplexicaule*		blue heliotrope
	Brassica	tournefortii*		wild turnip
	Cakile	sp.*		sea rocket
	Coronopus	didymus*		bittercress
	Lobularia	maritima*		sweet alyssum
Cactaceae	Opuntia	stricta*		prickly pear
Caryophyllaceae	Cerastium	glomeratum*		mouse ear chickweed
	Petrohragia	dubia*		velvet pink
	Spergularia	marina*		sea spurrey
Chenopodiaceae	Atriplex	hastate*		orache
	Atriplex	sp.*		saltbush
	Chenopodium	album*		fat hen
	Sarcocornia	quinqueflora		Samphire
	Sueda	australis		Austral Seablite
Convolvulaceae	Ipomoea	cairica*		coastal morning glory
	Ipomoea	indica*		purple morning glory
	Wilsonia	backhousei		Narrow-leaved Wilsonia
Cucurbitaceae	Citrullus	lanatus*	var. lanatus	wild melon
Dilleniaceae	Hibbertia	scandens		Golden Guinea Flower
Epacridaceae	Leucopogon	parviflorus		Coast Beard Heath
Euphorbiaceae	Ricinus	communis*		castor oil plant
Fabaceae - Faboideae	Hardenbergia	violacea		False Sarsaparilla
	Medicago	minima*		woolly burr medic
	Melilotus	indica*		Hexham scent
	Trifolium	sp.*		clover
	Vicia	sativa*	ssp. nigra	narrow-leaf vetch
Fabaceae - Mimosoideae	Acacia	longifolia	var. sophorae	Coastal Wattle
	Acacia	saligna*		golden wreath wattle
Fumariaceae	Fumaria	capreolata*		white-flower fumitory
Gentianaceae	Centaurium	erythraea*		pink stars
Goodeniaceae	Selliera	radicans		
Lamiaceae	Westringia	fruticosa		Coast Rosemary
Lauraceae	Cinnamomum	camphora*		camphor laurel
Malvaceae	Lagunaria	patersonia*	ssp. patersonia	Norfolk Island hibiscus

Myrsinaceae	Sida	rhombifolia*		paddy's lucerne
	Aegiceras	corniculatum		River Mangrove
Myrtaceae	Callistemon	citrinus		Crimson Bottlebrush
	Eucalyptus	robusta		Swamp Mahogany
	Leptospermum	laevigatum		Coastal Tea-tree
Oleaceae				
Onagraceae	Olea	europaea*	ssp. cuspidata	african olive
	Gaura	lindheimeri*		clock weed
	Oenothera	drummondii*		beach evening primrose
Oxalidaceae	Oenothera	stricta*	ssp. stricta	common evening primrose
	Oxalis	pes-caprae*		soursob
Papaveraceae				
Passifloraceae	Argemone	ochroleuca*	ssp. ochroleuca	Mexican poppy
	Passiflora	edulis*		passion fruit
Phytolaccaceae				
Pittosporaceae	Phytolacca	octandra*		ink weed
	Hymenosporum	flavum		Native Frangipani
Plantaginaceae				
Polygonaceae	Plantago	lanceolata*		lamb's tongue
	Acetosa	sagittata*		turkey rhubarb
	Rumex	obtusifolius*		broad-leaf dock
Primulaceae				
Proteaceae	Anagallis	arvensis*		scarlet pimpernel
	Samolus	repens		Creeping Brookweed
	Banksia	integrifolia		Coastal Banksia
Rosaceae				
Rutaceae	Rosa	rubiginosa*		sweet briar
	Correa	Alba		White Correa
Sapindaceae				
Selaginaceae	Cupaniopsis	anacardioides		Tuckeroo
	Hebenstretia	dentata*		hebenstretia
Solanaceae				
Verbenaceae	Solanum	nigrum*		blackberry nightshade
	Solanum	sp.*		
	Lantana	camara*		lantana
	Verbena	bonariensis*		purple top

Monocotyledons

Arecaceae

unidentified exotic palm

Commelinaceae	Commelina	cyanea		Scurvy Weed
	Tradescantia	fluminensis*		wandering jew
Cyperaceae	Carex	appressa		Tussock Sedge
	Cyperus	sesquiflorus*		
	Isolepis	nodosus		Knobby Club-rush
Juncaceae	Juncus	acutus*	ssp. acutus	spike rush
	Juncus	krausii		Sea Rush
Juncaginaceae	Triglochin	striata		Streaked Arrow-grass
Liliaceae - Alliaceae	Nothoscordum	borbonicum*		false onion weed
Liliaceae - Amaryllidaceae	Crinum	pedunculatum		Swamp lily
Liliaceae - Asparagaceae	Asparagus	aethiopicus*		asparagus fern
Liliaceae - Asphodelaceae	Asphodelus	fistulosus*		onion weed
Liliaceae - Phormiaceae	Dianella	caerulea		Blue Flax Lily
Poaceae	Ammophila	arenaria*		marrum grass
	Avena	sp.*		wild oat
	Briza	maxima*		quaking grass
	Cenchrus	incertus*		spiny burr grass
	Chloris	gayana*		rhodes grass
	Hyparrhenia	hirta*		coolatai grass
	Melinis	repens*		red natal grass
	Parapholis	incurva*		coastal barb grass
	Phragmites	australis		common reed
	Poa	annua*		winter grass
	Poa	sp.*		
	Rostraria	cristata*		annual cat's-tail
	Setaria	palmifolia*		palm grass
	Spinifex	sericeus		Beach Spinifex
	Sporobolus	virginicus		Salt Couch
	Stenotaphrum	secundatum*		buffalo grass
	Zoysia	macrantha		Prickly Couch
Pontederiaceae	Eichhornia	crassipes		water hyacinth
Xanthorrhoeaceae				
	Lomandra	longifolia		Spiny-headed Mat Rush