
Sea sPurge Remote Area TeamS: summary of work performed 2006/07 to 2020/21, work required 2021/22



Brown fur seal near Trumpeter Isletss

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SPRATS: aims and objectives

The WildCare¹ group, Sea sPurge Remote Area TeamS (SPRATS), is a self-managing group of volunteers working in partnership with the Tasmanian Parks and Wildlife Service (PWS). For the last 15 years the group's main objective has been to control and if possible eradicate the ecosystem-transforming weeds sea spurge (*Euphorbia paralias*), marram grass (*Ammophila arenaria*) and blackberry (*Rubus fruticosus* aggregate) from the coastline of the Tasmanian Wilderness World Heritage Area (TWWHA) and its adjacent areas on Tasmania's west coast.

This region is one of the most important areas in Australia for conservation. Other than the target weeds, the region has a low weed incidence and is a major stronghold for a number of shore-nesting and feeding birds, including the hooded plover, pied oystercatcher and sooty oystercatcher along with the orange-bellied parrot during its migration. These bird species are at risk due to sea spurge and marram grass' ability to transform the coastline's geomorphic structure, making it less suitable for breeding and feeding.

At its inception, SPRATS detailed its aims and objectives in a ten year plan² covering the period 2007/08 to 2016/17. The aims and objectives in this plan have now been met and a second ten year plan³ covering the period 2017/18 to 2026/27 has been developed. The new plan details work performed to date, methodologies and strategies used for weed control along with objectives for the next ten years.

A feature of SPRATS' work program is collection of detailed, geo-referenced data on all weeds removed along with targeted research into the most effective treatment method. This data is used to demonstrate work effectiveness, plan work programs and report back to the PWS and other funding bodies. At the start of each weeding season, detailed maps are prepared showing weeding sites, campsites and walking routes. This data is downloaded into GPS units so that all groups can efficiently and easily locate previously recorded weed sites, campsites and walking routes.

SPRATS' results have been recognised by:

- finalist in the 2017 Tasmanian Community Achievement Awards;
- winning the 2016 Invasive Species Council's Froggatt Award for control and eradication⁴;
- selected as a case study showing the effective use of volunteers for environmental work⁵;
- winning the community group category of the 2009 Tasmanian Environmental awards;
- finalist in the 2009 and 2010 Banksia Environmental awards - community group category.

SPRATS have also been at the forefront of the development of *adventure volunteering*, which is the linking of effective and highly targeted environmental work with high value recreational activities.

Summary of work performed 2006/07 to 2020/21

SPRATS budget and funds expended

SPRATS has been highly effective at value-added remote-area weed management. To date, for an input of \$325 000 of state and federal grant money, about \$2 190 000 of volunteer labour has been performed, a return of about 7 to 1 (Figure 1)⁶.

¹ WildCare Incorporated. Volunteer arm of the Tasmanian Parks and Wildlife Service. See: <http://wildcaretas.org.au/>.

² Controlling coastal weeds in Southwest Tasmania: a 10-year plan to protect coastal environments of Southwest Tasmania from ecosystem-threatening weeds. SPRATS 2007.

³ SPRATS: review of 2006/07 to 2016/17, plan for 2017/18 to 2026/27. SPRATS 2018.

⁴ See: <https://invasives.org.au/projects/froggatt-awards/>

⁵ A Collective Effort 2010–12: A report on progress of the Natural Resource Management Strategy for Southern Tasmania 2010–15. Natural Resource Management South, Hobart, Tasmania.

⁶ Volunteer work day costed at \$35 per hour per 8-hour day. Note that Volunteering Tasmania recommends that when volunteering involves overnight stays, work days should be costed on a 24-hour basis, which would increase volunteer input to about \$6 565 500 and the ratio of volunteer to grant money to about 20 to 1.

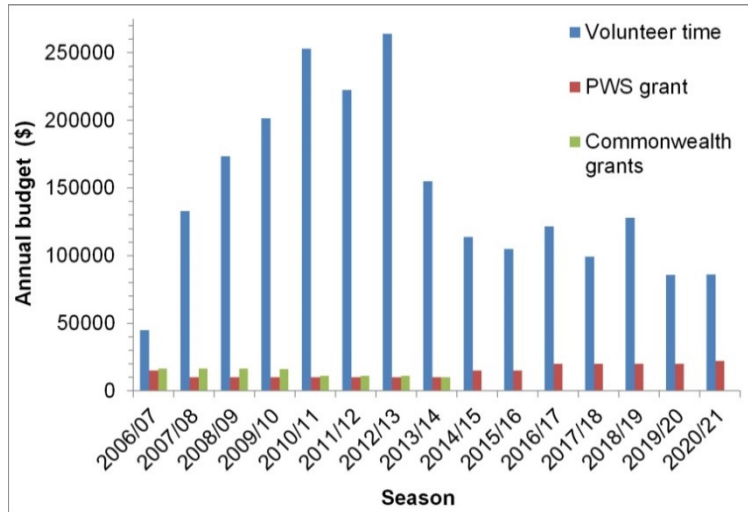


Figure 1. SPRATS annual budget 2006/07 to 2020/21.

SPRATS work area

There is about 850 km of coastline between Macquarie Harbour and Cockle Creek, with about 425 km of this coastline being considered susceptible to sea spurge and/or marram grass invasion. To assist with the organising of SPRATS’ weeding efforts, the coastline has divided the area into eight sectors (Figure 2, Table 1).

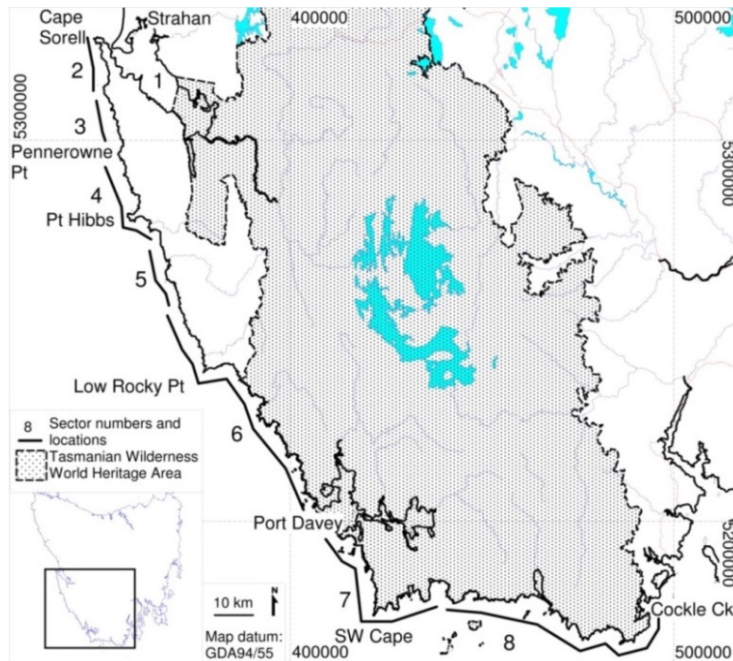


Figure 2. Weeding sectors between Macquarie Harbour and Cockle Creek.

Table 1. Weeding sectors between Macquarie Harbour and Cockle Creek.

Sector	Location	Methodology	Length (km)
1	Macquarie Harbour, kayak based	kayak	160
2	Macquarie Heads to Gorge Beach	walking	30
3	Gorge Beach to Pennerowne Pt	walking	15
4	Pennerowne Pt to Endeavour Beach	walking	35
5	Endeavour Beach to the Mainwaring River	walking	20
6	Mainwaring River to Bramble Cove, including Port Davey	walking	105
7	SW Cape circuit, including Hannant Inlet	walking	25
8	South Coast between Cox Bight and Cockle Creek	walking	35
Length of coastline surveyed and weeded by SPRATS			425

The strategy utilised by SPRATS in its first three years was to concentrate weeding efforts in the 220 km of susceptible coastline between Pennerowne Point and Cockle Creek. Once the sea spurge infestations in this area had an initial knock-down, SPRATS then moved north to include the very large infestations in the about 45 km of susceptible coast between Pennerowne Point and Cape Sorell. Over the past five seasons SPRATS has expanded its work area out to include the about 160 km of susceptible coastline in Macquarie Harbour. In addition, SPRATS has performed weed surveys along about 50 km of shoreline in Bathurst Harbour using a PWS boat.

During the 2020/21 season, SPRATS crews weeded Sectors 1 to 4, 6 and the northern part of Sector 7. Sector 5, the southern part of Sector 7 and Sector 8 were weeded by SPRATS affiliated bushwalkers.

Prior to SPRATS commencing weeding in 2006/07, the region contained about 11.1 million sea spurge plants and about 124 000 marram grass clumps. In 2020/21 weeds have been mapped from 845 sites, made up of 688 sea spurge sites, 152 marram grass sites, four blackberry sites and three Giant Mullein sites.

Number of people involved

The number of people involved and work days performed is summarised in Table 2.

Table 2. Number of people involved and work days performed between 2006/07 and 2020/21.

Season	Project planning Days	Sectors 1 to 3 Macquarie Harbour to Pennerowne Pt		Sectors 4 to 8 Pennerowne Pt to Cockle Ck		Totals	
		People	Days	People	Days	People	Days
2006/07	10	2	10	10	140	12	160
2007/08	65	10	20	18	390	27	475
2008/09	100	29	300	17	220	45	620
2009/10	120	23	275	21	325	43	720
2010/11	100	42	536	18	268	59	904
2011/12	100	33	396	25	298	55	794
2012/13	100	45	495	29	348	72	943
2013/14	100	22	272	12	182	34	554
2014/15	50	23	216	12	140	35	406
2015/16	25	15	165	15	185	32	375
2016/17	25	15	145	15	264	32	436
2017/18	25	14	164	12	168	26	357
2018/19	30	21	244	10	183	32	457
2019/20	30	9	117	9	159	19	306
2020/21	30	14	126	9	157	23	313
Totals	910		3465		3441		7816

Note: some participants did more than one sector and communication support was provided by off-site personnel.

Sea spurge weeding

During 2020/21, a total of 53 772 sea spurge plants were removed and 20 new sea spurge sites recorded. To date, SPRATS have removed over 14.366 million sea spurge, reducing the number of plants by about 99.6% (see Table 3; Figures 3a, 3b).

However, the sea spurge weeding performed by SPRATS can be divided into two categories: the steady decline in the number of plants in repeatedly weeded sites versus the number of plants in sites which had not been weeded for several years.

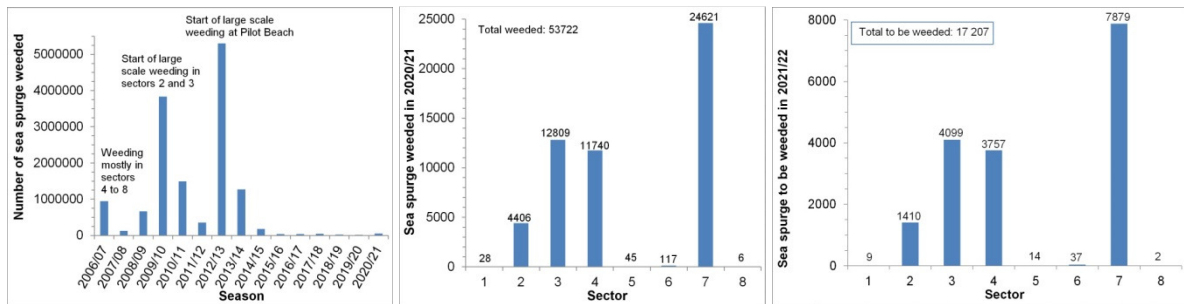
In sites that had been annually weeded over the 15 years since 2006/07, there was a nearly 60% reduction in the number of plants compared to the previous season, with total numbers in these sites having been reduced by over 99.9%.

In contrast, four sites containing about 23 700 plants were found in Sectors 2 to 4 that had been missed during the weeding over the past three to five years. In addition, none of Sector 7 had been checked for three years and the whole sector had not been weeded for five years. When Sector 7 was weeded during 2020/21 nearly 25 500 plants were found in three sites at Stephens Bay. These seven sites account for about 90% of the sea spurge weeded

in 2020/21. This issue has been addressed by moving the site's waypoint location to be centred on the location of the current infestation and weeding crews will be specifically briefed regarding the importance of checking these sites next season.

As has been the situation over the past few years, there also appears to be an increasing number of seedlings from new wash-ins. This is probably a reflection of the increasing infestations to the north of the SPRATS' work area (eg the about 53 000 000 sea spurge plants between Macquarie Heads and Pieman Heads⁷).

In sites that have been weeded multiple times, on average there has been a 68% reduction in the number of sea spurge plants with each weeding event. This relationship has been used to estimate the number of plants that will need weeding in 2021/22 (assuming that no new large infestations are found) and predicts that about 17 200 plants will need to be weeded (Figure 3c). Nearly half of these plants are at Stephens Bay in Sector 7.



a) Sea spurge weeded 2007 to 2021. b) Sea spurge weeded in 2021. c) Sea spurge to be weeded in 2022
Figure 3. Number of sea spurge plants between Macquarie Harbour and Cackle Creek.

Table 3. Number of sea spurge plants weeded between 2006/07 and 2020/21.

Sector	Sector								Totals
	1	2	3	4	5	6	7	8	
2006/07	*	*	32460	852122	56	61151	8	710	946507
2007/08	*	*	**100	96693	53	21335	3559	1502	123242
2008/09	*	11494	330141	319294	40	1579	371	7	662926
2009/10	*	626432	2271611	937773	27	156	97	125	3836221
2010/11	*	137508	1297281	53107	13	1421	312	11	1489653
2011/12	*	84294	242920	18180	2	644	9510	17	355567
2012/13	*	5197777	95076	6584	84	761	4645	12	5304939
2013/14	*	1232604	34452	4997	*	1223	509	**0	1273785
2014/15	*	153777	20637	2788	*	293	97	3	177595
2015/16	*	24106	8380	1500	**0	276	7	**0	34269
2016/17	11	28160	4220	1256	9	485	*	*	34141
2017/18	38	37148	3830	2292	*	283	17	78	43686
2018/19	12	6020	9083	1444	**0	1253	*	32	17844
2019/20	*	1094	8370	2778	*	641	*	13	12896
2020/21	28	4406	12809	11740	45	117	24621	6	53772
Totals	89	7544820	4371370	2312395	329	91618	43753	2516	14366890

Note: * = sector not weeded, ** = only the main, previously recorded sites were weeded.



Port Davey from Earls Point

⁷ Marsden-Smedley JB, Roberts S, Roberts C, Roberts I and Roberts G 2017. Sea spurge and marram grass survey: Macquarie Heads to Pieman Heads. Sea Spurge Remote Area Teams, Tasmania.

An example of site recovery is the previously very large site at Sassy Creek which has continued to recover with no new sea spurge plants being recorded (Figure 4).



Dec 2001: ~10 000 plants, site not weeded



Dec 2006: ~30 000 plants, first weeded Feb 2007



Jan 2008: ~10 000 seedlings removed



Jan 2011: 14 seedlings removed



Jan 2013: no plants found



Jan 2016: no plants found



Jan 2018: no plants found



Jan 2021: no plants found

Figure 4. Changes in the Sassy Creek SCS1 sea spurge site between 2001 and 2021.

Note: in total about 40 275 sea spurge plants have been weeded from this site.

Marram grass weeding

In the early years of SPRATS operations, marram grass weeding was a lower priority than sea spurge weeding, marram grass identification is difficult for many volunteers and the treatment involved the slow and laborious wiping with herbicide or digging out entire clumps. During recent seasons, improved training of volunteers in marram grass identification and the use of the monocot specific herbicide haloxyfop along with Pulse penetrant has resulted in a significant increase in marram grass removal.

On average, compared to the 2019/20 season there was a 68% reduction in the number of marram grass clumps, a halving of the time required to spray each site and about a 90% reduction in the amount of herbicide used. This means that backpack sprayers are no longer required at Dunes Beach with the sprayers being moved to the helicopter landing site so they can be flown out at the start of next season.

The biggest issue with marram grass spraying is that the remaining marram grass has thinned out requiring thorough searching of the sites. It is probable that intensive marram grass treatment will be required at Endeavour Beach, Neilson River, Discovery Beach, Dunes Beach and Pilot Beach for about the next three to five years.

Blackberry and Giant Mullein weeding

No blackberries were reported during the 2020/21 season. A total of 138 Giant Mullein were pulled from Sector 6. Due to the small number and limited distribution of Giant Mullein along with their potential to increase, they should be targeted when Sector 6 is weeded.

Future work

The SPRATS AGM and planning meeting will be held on Saturday 1 May 2021 at which the weeding strategy for the 2021/22 season will be finalised. Operational planning for 2021/22 will maintain combined emphasis on sea spurge and marram grass in sectors 2, 3, 4, and 7 and options for managing sectors 1, 5, 6 and 8.

Sea spurge biocontrol

A biocontrol for sea spurge has been recently developed by the CSIRO and approved for release in Australia. This biocontrol consists of a fungus, *Venturia paralias*, which was identified following surveys in sea spurge's native range along the Atlantic and Mediterranean coasts of Europe. This biocontrol has been shown to be highly specific to sea spurge and one other weedy introduced spurge (note that there are no native close relatives to sea spurge in Australia).

The final research required into the optimum methodology for applying the biocontrol is currently being performed in NSW and should be completed by the middle of 2021. If everything goes to plan, a trial release of the biocontrol will be performed in a number of sites in Tasmania in September or October 2021.

The sea spurge biocontrol has the potential to assist with the work being performed by SPRATS in that it should greatly reduce the size and occurrence of the very large sea spurge infestations to the north of SPRATS work area. This in turn should reduce the number of sea spurge seeds that float in, reducing re-invasion into the areas that have been weeded by SPRATS. However, it is probable that, provided it is effective, the biocontrol will take several years to a decade to become fully established and reduce the large sea spurge infestations that occur outside the SPRATS work area.

Wildlife monitoring by SPRATS groups

Shorebirds

As part of its survey work, SPRATS groups collect data on the numbers of the three main shorebirds, Pied oystercatchers, Sooty oystercatchers and hooded plovers. In this data,

there was a high degree of consistency in the data collected in different seasons and there are no obvious trends indicating an increase or decrease in the numbers of these shorebirds. The occurrence of other shorebirds (eg Red capped plovers, small terns), raptors and Tasmanian devils are also recorded when seen.

However, the primary aim of SPRATS groups is weed control and it is difficult to comprehensively search for and treat weed sites whilst also counting the number of some shorebirds, especially Hooded and Red capped plovers. This means that the number of Hooded plovers has been under-estimated, probably by between 50 to 100% (ie their actual numbers may be up to double those recorded). In addition the data suggests that for Pied oystercatchers and Hooded plovers about five to ten percent of the Tasmanian population of these species occur within the SPRATS area.

The average numbers of Pied oystercatchers, Sooty oystercatchers and hooded plovers recorded over the ten year period between 2011/12 and 2020/21 are in Table 4. The observations on shorebird numbers also suggests at the time of year that the observations have been made (early to mid-January) that 80% of these shorebirds are in pairs with the remaining being non-breeding birds and/or juveniles.

Table 4. Average number of Pied oystercatchers, Sooty oystercatchers and Hooded plovers observed per season between 2011/12 and 2020/21.

Sector	Pied oystercatchers	Sooty oystercatchers	Hooded plovers
2	13.0	46.4	14.6
3	22.0	4.3	17.4
4	38.1	25.3	26.7
6	83.7	65.0	57.7
7	20.7	14.3	25.3
8	36.3	22.0	15.5
Average number of birds	213.7	137.4	157.2
Estimated number of pairs	85.5	54.9	62.9

Note there were insufficient data to estimate the number of shorebirds in Sectors 1 and 5.

Of note during the 2020/21 season was the observation of a flock of over 40 small terns on a small island in the northern part of Nye Bay (species uncertain but probably Fairy terns or Little terns). On Garden point in Port Davey, three very agitated Fairy terns were observed over several days, suggesting that they were nesting on the adjacent gravel bank (Figure 5).



Figure 5. Fairy terns at Garden Point.



Pied oystercatcher on Prion Beach

Beached Pilot whales

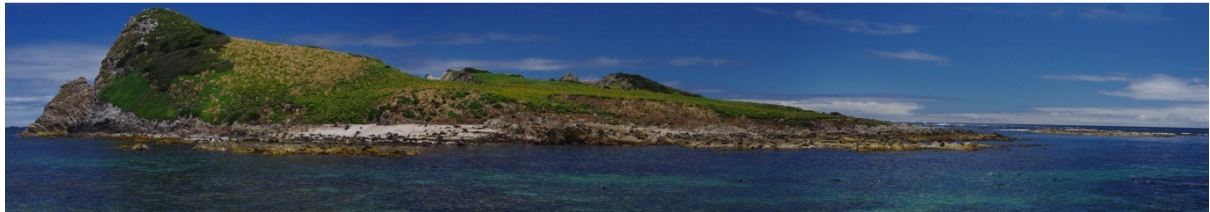
There was a major Pilot whale beaching on Ocean Beach and Macquarie Heads in November 2020. The bodies of many of the deceased Pilot whales were towed out to sea and released with some of these whales washing up in SPRATS' work areas. In total, 86 washed up Pilot whales were recorded in Sector 2, 42 in Sector 3, 48 in Sector 4 and six in Sector 6. In addition, there were some additional Pilot whales washed up in Sectors 6 and 8 which appeared to significantly pre-date November 2020 suggesting there may have been another (probably smaller) stranding event about a year ago.

Seals

The seal colony on Trumpeter Islets has greatly expanded since its establishment about five years ago. During this time the number of seals has increased to at least 3000 and there has been large impacts to the island's and adjacent mainland's vegetation (Figure 6).



Trumpeter Islets in Jan 2013 - prior to seal colony establishing



Trumpeter Islets in Jan 2016 - estimated 500 to 600 seals



Trumpeter Islets in Jan 2018 - estimated 500 to 1000 seals



Trumpeter Islets in Jan 2021 - estimated 3000+ seals

Figure 6. Changes at Trumpeter Islets seal colony over about the past five years.