Sea sPurge Remote Area TeamS:
summary of work performed 2006/07 to 2024/25

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Cover photo: Michael about to attack a multi-year old sea spurge on Prion Spit in Sector 8

SPRATS: aims and objectives

The WildCare[1] group SPRATS (Sea sPurge Remote Area TeamS), is a self-managing volunteer group working in partnership with the Parks and Wildlife Service (PWS). The group works in coastal areas on Tasmania's west and south coasts between Macquarie Harbour and Cockle Creek in the Tasmanian Wilderness World Heritage Area and its adjacent buffer (Figure 1).

For the last 19 years SPRATS and its associated weeders have been controlling and then working towards eradicating the ecosystem-transforming weeds sea spurge (*Euphorbia paralias*), marram grass (*Ammophila arenaria*) and blackberry (*Rubus fruticosus* aggregate).

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's 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 plan[2] covering the period 2007/08 to 2016/17. The aims and objectives in this first plan were met and the group is working to complete its second ten year plan[3] covering the period 2017/18 to 2026/27. These management plans detailed the group's objectives, work performed along with the methodologies and strategies utilised for weed control.

A feature of SPRATS' work program is collection of geo-referenced data on all weeds removed along with targeted research into the most effective treatment methods. 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 also downloaded into GPS units so that all groups can efficiently and easily locate previously recorded weed sites, campsites and walking routes. SPRATS crews also collect information on other values and issues. This includes shore bird types and numbers, Tasmanian devil sightings, cultural heritage sites, whale strandings and use of the region by other users.

SPRATS' results have been recognised by:

- highly commended, CoastCare Award, 2021 Tasmanian LandCare Awards;
- finalist in the 2017 Tasmanian Community Achievement Awards;
- winning the 2016 Invasive Species Council's Froggatt Award for control and eradication[4];
- selected as a case study showing the effective use of volunteers for environmental work[5];
- 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 links effective and highly targeted environmental work with high value recreational activities.

Four the past four years SPRATS has been leading the work testing under Tasmanian conditions the sea spurge biocontrol agent recently developed by the CSIRO. This biocontrol has the potential to provide a long-term solution to the issues associated with sea spurge.

In November 2024, SPRATS ran a highly successful coastal weed management workshop. This workshop summarised the values at risk, current research and reviewed much of the work currently being performed by volunteer groups managing coastal weeds in Tasmania.

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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.

Summary of work performed 2006/07 to 2024/25

SPRATS work area

In the approximately 850 km of coastline between Macquarie Harbour and Cockle Creek, there is about 425 km of coastline that is susceptible to sea spurge and/or marram grass invasion. To organise the SPRATS' weeding program, the coastline has been divided into eight sectors (Figure 1, Table 1).

Prior to SPRATS commencing weeding in 2006/07, the region was surveyed and contained an estimated 11.1 million sea spurge plants and about 124 000 marram grass clumps. By 2024/25 these weeds had been mapped from a total of 879 sites, made up of 713 sea spurge, 158 marram grass, four blackberry, three Great Mullein and one slender thistle.

When SPRATS crews weed sea spurge, the number of plants pulled are classified into either juvenile (not yet developed seed), mature (developed seed but are unlikely to have dropped any seed) or multi-year (developed and may have dropped seed).

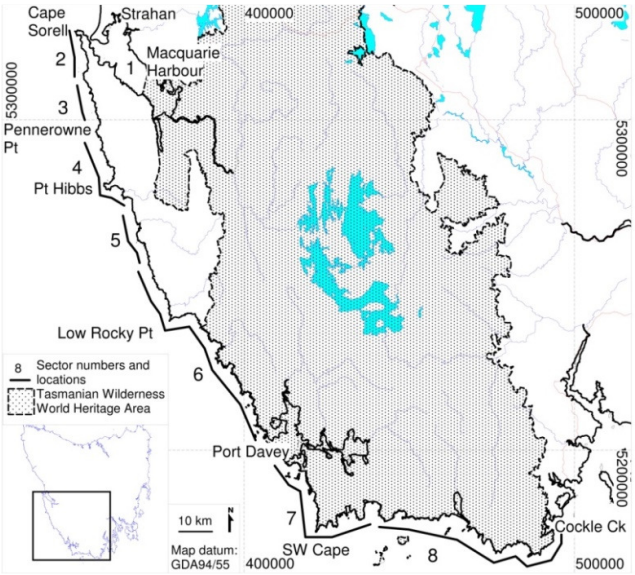


Figure 1. Weeding sectors between Macquarie Harbour and Cockle Creek.

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

Sector	Location	Weeding methodology	Length of susceptible coast (km)
1	Macquarie Harbour	kayak	160
2	Cape Sorell to Gorge Beach	walking	30
3	Gorge Beach to Birthday Bay	walking	15
4	Birthday Bay 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
Approximate length of coastline surveyed and weeded by SPRATS each season			425

The strategy utilised by SPRATS in its first three years was to concentrate weeding efforts in about 220 km of susceptible coastline between Pennerowne Point and Cockle Creek. Once the sea spurge infestations in this area had been knocked-down, SPRATS weeding expanded northwards to include the very large infestations in the 45 km of coast between Pennerowne Point and Cape Sorell. SPRATS then expanded its work area to include about 160 km of coastline in Macquarie Harbour and about 50 km of shoreline in Bathurst Harbour. During the 2024/25 season, SPRATS crews surveyed and weeded all sectors.

SPRATS volunteers are supplied with GPS-enabled satellite communication devices and hand-held GPS units programmed with previously recorded weed sites, and paper maps showing currently active weed sites, walking routes and campsites.

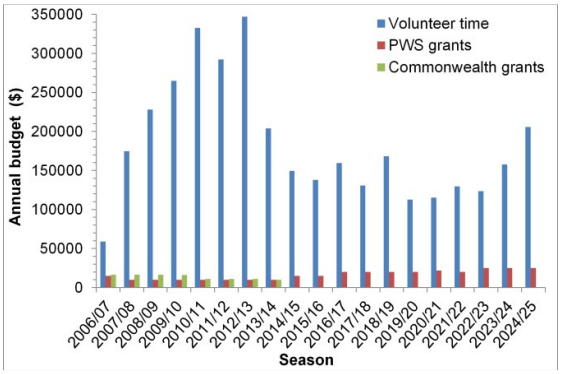
SPRATS budget, funds expended and people involved

SPRATS has been highly effective at value-added remote-area weed management. To date, for an input of about $420 000 of state and federal grant money (~75% of which has been provided by the PWS), about $3 493 000 of volunteer labour has been performed, a return of about 8.3:1 (Figure 2a)[6]. The number of people and work days performed is summarised in Table 2 and Figure 2b.

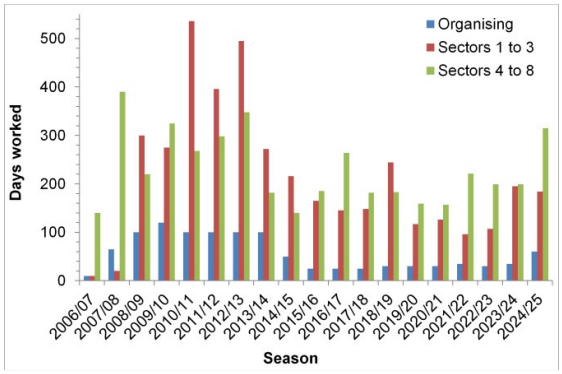
Table 2. Number of people involved and work days performed between 2006/07 and 2024/25.

	Planning		Sectors 1 to 3		Sectors 4 to 8		Totals
Season	Days	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
2021/22	35	8	96	16	221	26	352
2022/23	30	11	107	14	199	26	336
2023/24	35	15	195	15	199	31	429
2024/25	60	16	184	19	315	39	559
Totals	1070		4047		4375		9492

Note: some participants did multiple sectors, communication was provided by off-site personnel.



a) budget



b) days worked

Figure 2. SPRATS annual budget and days worked: 2006/07 to 2024/25.

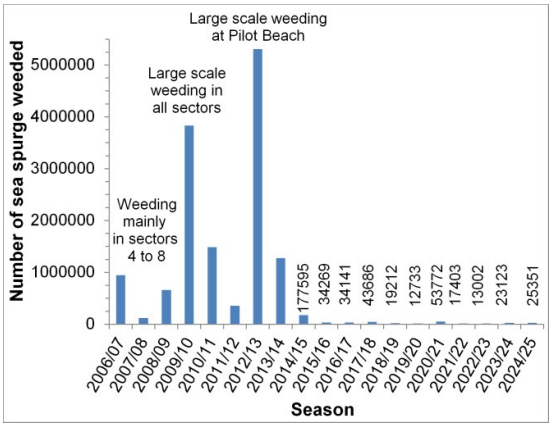
Sea spurge weeding

During the 2024/25 season, a total of 25 351 sea spurge were hand weeded (Figure 3), representing a 99.8% reduction on the pre-SPRATS number of plants. In total, over 19 seasons, SPRATS has weeded about 14 447 300 sea spurge (Table 3), with 9 new sea spurge sites recorded in 2024/25. The result is that SPRATS has reduced the number of sea spurge to non-critical ecological and geomorphological levels, but annual weeding is required to continue to maintain this situation. If the program were to stop for just two or three years, the weed numbers are likely to escalate to levels that are very hard to control with current SPRATS and PWS resources. However, this situation may change in the future

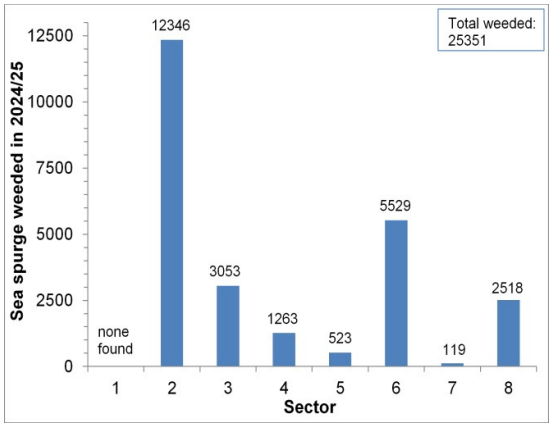
[6] Volunteer work day costed at $46 per hour per 8-hour day. Note that Volunteering Tasmania recommends that when volunteering involves overnight stays, work days should be costed on a 24-hour basis, which would increase volunteer input to about $10 479 000 and the ratio of volunteer to grant money to about 25:1.

if the sea spurge biocontrol (see below) turns out to be effective at reducing the number of new wash-in seeds invading the SPRATS work area.

Over the past few seasons, it has become clear that, within western and southwestern Tasmania, sea spurge has had enhanced growth rates and decreased times for plants to reach maturity. In the first decade of SPRATS weeding, few sea spurge plants reached maturity within their first year (in contrast to sea spurge on the east and north coast of Tasmania where it is common for sea spurge to reach maturity in less than six months and produce large seed crops by 12 months of age). In contrast, over about the last five years it has become common to find sea spurge plants that are about one year old, fully mature, multi-stemmed and are carrying large amounts of seed. These changes are probably the result of the warm dry summers that have prevailed in recent years. Provided SPRATS removes these plants in January, it is probable that these plants will not have dropped seed to replenish soil seed bank. However, if these plants are missed for a second season, then the large amount of seed produced will replenish the soil seed bank, resulting in the requirement for intensive weeding over several seasons. This also means that what we would have been calling “multi-year” plants in past years are, in most cases, plants that are early in their second year.



a) Sea spurge weeded 2006/07 to 2024/25



b) Sea spurge weeded in 2024/25

Figure 3. Sea spurge weeding.

Table 3. Number of sea spurge plants weeded between 2006/07 and 2024/25.

	Sector								
	1	2	3	4	5	6	7	8	total
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	7386	9082	1444	**0	1253	*	32	19209
2019/20	*	1094	8370	2787	*	641	*	13	12905
2020/21	28	4406	12809	11740	45	117	24621	6	53772
2021/22	*	1164	4656	6816	*	168	4385	214	17403
2022/23	4	3470	2737	3781	** 24	2001	876	109	13002
2023/24	*	3479	11134	651	*** 3782	3758	319	*	23123
2024/25	0	12346	3053	1263	523	5529	119	2518	25351
Total	93	7566645	4392849	2325068	852	103074	49452	5357	14447296

Note: * = sector not weeded; ** = only previously recorded sites weeded; *** = sector partly weeded.

As has been the situation in past seasons, the majority of the sea spurge weeded were located in sites that been missed in recent seasons. Overall, about 50% of the number of sea spurge weeded were in sites that had been missed last year, with this number increasing to about 82% when the number of plants located in sites that were missed in 2021/22 and 2022/23 are included. About 90% of these plants were seedlings. This issue has been addressed by either creating a new site or moving the original site's GPS grid point to the active location.

It appears probable that there are increasing numbers of new sea spurge seeds washing in from the very large infestations to the north of the SPRATS work area. This issue of an increasing number of new wash-in seeds is not restricted to the SPRATS work area, with it also occurring to a marked degree on the east coast of Tasmania. Provided the sea spurge biocontrol is shown to be effective (see below), this issue should be addressed in the long-term by releasing the biocontrol in northern Tasmania and on the mainland of Australia.

Marram grass weeding

During the 2024/25 season, a total of 444 marram grass clumps were weeded, mostly by spraying with a monocot-specific herbicide. This represents a 99.6% reduction on the pre-SPRATS number of plants. In total, over 19 seasons, SPRATS has weeded about 150 500 marram grass clumps, with two new marram grass sites being recorded in 2024/25.

Small-scale marram grass spraying will be required at Endeavour Beach, Nielsen River, Discovery Beach, Dunes Beach and Pilot Beach for the next few years.

Other weeds

No blackberries have been recorded at any of the four mapped sites over the past ten years, indicating that these infestations have been eradicated.

At Pilot Beach and Macquarie Heads in Sector 2, SPRATS crews performed intensive weeding of a number of other weed species in November 2024 and January 2025. The main weeds targeted were:

> Foxglove (*Digitalis purpurea*), Spear thistle (*Cirsium vulgare*), Hebe (*Veronica elliptica*), Arum (*Zantedeschia aethiopica*), Agapanthus (*Agapanthus praecox*), Radiata pine (*Pinus radiata*), Blue butterfly bush/African rosemary (*Psoralia pinnata*), Canary broom (*Genista monspesulana*), Montbretia (*Crocosmiax crocosmiiflora*) and Ox-eye/Shasta daisy (*Leucanthemum* spp.).

Good progress has been made at Pilot Beach with controlling foxglove with twice yearly weeding (November and January) required for several more years. Constructive discussions have also been held with the local shack owners whilst the weeding was being performed. Over the next few months, a weed control management plan for Pilot Beach and Macquarie Heads will be developed.

A total of 86 Great Mullein were weeded from two sites near the Shank in Sector 6.

The number of spear thistles in the SPRATS work area is of concern. Over the past couple of decades these thistles have been observed to go through a boom-bust cycle and appear to be at high numbers in some locations. This weed will be monitored in future seasons. However, other than in small areas, comprehensive weeding of spear thistles is probably well beyond the capacity of SPRATS groups to perform.

SPRATS work on the sea spurge biocontrol

A biocontrol agent for sea spurge was approved for use in 2021[7]. This agent has been extensively researched and consists of a fungus, *Venturia paralias,* that has been shown to be highly specific to sea spurge (and weakly infective to one other introduced weedy spurge). The agent was isolated from sea spurge's native range on the Atlantic coast of

[7] Final risk analysis report for the release of *Venturia paralias* for the biological control of *Euphorbia paralias.* See: https://www.agriculture.gov.au/biosecurity/risk-analysis/biological-control-agents/risk-analyses/completed-risk-analyses/ra-release-venturia-paralias.

France. Since sea spurge has no closely related species in Australia, with all native Australian *Euphorbia* spp. being in a different sub-genus to sea spurge, the biocontrol agent has been assessed to be very low risk as it is extremely unlikely to spread to and infect native species.

The biocontrol infects sea spurge through leaf lesions which then spread to the stem, girdling it and causing stem collapse. The lesions typically form 11 or 12 days after infection[8] and then kill the stem over the following weeks to months.

Since early 2021, SPRATS, working in cooperation CSIRO and PWS, has released the biocontrol agent at 18 test locations in Tasmania. At all of these sites, detailed data has been collected at six month intervals on sea spurge cover, height, health and reproductive status.

The aim of this monitoring is to test, under Tasmanian conditions, the effectiveness of the sea spurge biocontrol agent with the following questions being addressed:

- will the biocontrol survive on sea spurge plants between seasons;
- will the biocontrol kill sea spurge plants and reduce its coverage;
- will the biocontrol spread beyond the original release locations;
- examine how variation in seasonal conditions affects the biocontrol's activity and effectiveness.

This monitoring is indicating that active biocontrol is present in all of the sites (with the possible exception of one site) showing that it is persisting under Tasmanian conditions. On average, across the monitoring sites the biocontrol has resulted in a halving of sea spurge cover. It has also resulted in large reductions in sea spurge health status, reproductive status, proportion of adult foliage and the killing of the majority of multi-year plants. The biocontrol has spread beyond the original release sites and is probably resulting in a major reduction in the number of seeds produced.

It is probable that it will take at least another two to four years before large scale reductions in sea spurge occur at the monitoring sites.

While the biocontrol has resulted in reductions in sea spurge vigour, it is highly unlikely that the biocontrol by itself will result in sea spurge eradication. It does, however, have the potential to result in reduced environmental impacts with sea spurge being just another coastal weed. This means that sea spurge's impacts could become similar to the weed sea rocket (*Cakile* spp.), which although widespread and has been observed to go through boom-bust cycles, and does not appear to result in high level ecosystem-transforming impacts.

Coastal weed management workshop

The Tasmanian Coastal Weeds Workshop was organised and run by SPRATS in Hobart on 6 November 2024. The workshop brought together key coastal weed management groups and experts to share and discuss issues, current research and management strategies for addressing threats posed by coastal weeds. The workshop identified key themes and common management issues shared by different groups with the collective knowledge providing a basis for planning and coordinating future work.

SPRATS AGM and planning meeting: Saturday 01 March 2025

The SPRATS AGM will be held at 41 Avon Road South Hobart between 10:45 and 13:30 on Saturday 01 March 2025. For those who cannot attend in person, there will be a zoom link sent out prior to the meeting. At the AGM, election of office bearers for the next year will be made.

The meeting will be followed by lunch for those attending in-person.

Please RSVP to <sprats.tas@gmail.com> if you plan to attend so we know numbers.

[8] Hunter GC, Zeil-Rolfe I, Jourdan M, Morin L 2019. Information package to support application to release the fungus *Venturia paralias* for the biological control of sea spurge (*Euphorbia paralias*) in Australia. CSIRO.