



Sea sPurge Remote Area TeamS: summary of work performed 2006/07 to 2022/23,

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for SPRATS**

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Cover photo: Wilson Bight in Sector 7

SPRATS: aims and objectives

The WildCare¹ group, Sea sPurge Remote Area TeamS (SPRATS), is a self-managing volunteer group working in partnership with the Parks and Wildlife Service (PWS). For the last 17 years (test season followed by 16 years of SPRATS weeding) the group has been controlling and then working towards eradicating the ecosystem-transforming weeds sea spurge (*Euphorbia paralias*), marram grass (*Ammophila arenaria*) and blackberry (*Rubus fruticosus* aggregate). The group works in coastal parts of the Tasmanian Wilderness World Heritage Area (TWWHA) and its adjacent buffer areas on Tasmania’s west and south coasts between Macquarie Harbour and Cockle Creek (Figure 1).

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 first plan have been met and the group is working to complete its second ten year plan³ covering the period 2017/18 to 2026/27. The current plan details the work performed to date, along with the objectives, methodologies and strategies used 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 (Figure 2) 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’ 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 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.

A major development for SPRATS in the past two seasons is work leading the Tasmanian component of the testing and spreading of the sea spurge biocontrol recently developed by the CSIRO. This biocontrol has the potential to provide a long term solution to the issues associated with sea spurge. SPRATS crews also collect information on other values, including shore bird types and numbers, Tasmanian devil sightings, cultural heritage sites, whale strandings and use of the region by other users. For example, following the October 2022 Ocean Beach pilot whale stranding, SPRATS crews were asked to record washed up pilot whales, with 42 being recorded in Sector 2, seven in Sector 3, 24 in Sector 4, eight in Sector 6 and one in Sector 7, making a total of 82 washed up pilot whales.

¹ WildCare Incorporated. Volunteer arm of the Tasmanian Parks and Wildlife Service. See: <http://wildcarea.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 2022/23

SPRATS work area

In the 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 assist with running the SPRATS' weeding program, the coastline has been divided the area into eight sectors (Figure 1, Table 1).

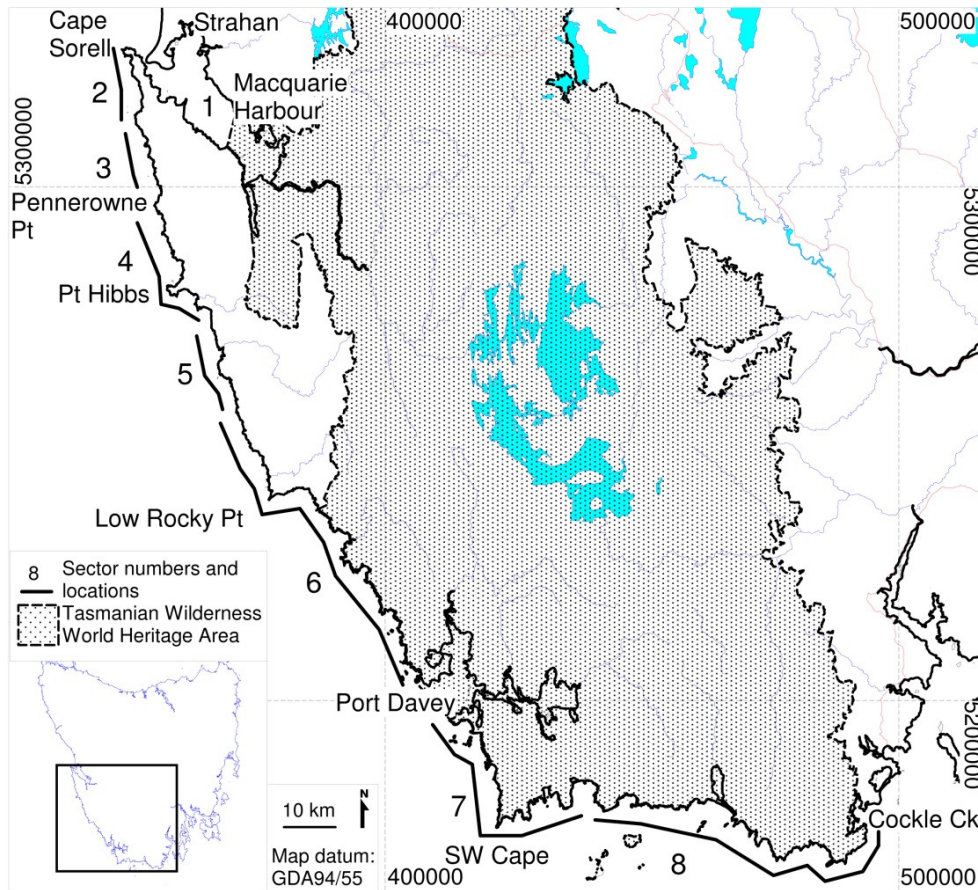


Figure 1. Weeding sectors between Macquarie Harbour and Cockle Creek.

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
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 susceptible areas along the 220 km of coastline between Pennerowne Point (just south of Birthday Bay) and Cockle Creek. Once the sea spurge infestations in this area had been given an initial knock-down, SPRATS weeding then moved north 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. The group has also done weed surveys along about 50 km of shoreline in Bathurst Harbour.

SPRATS summary: 2022/23



Figure 2. Example of the maps supplied to participants showing weed sites, walking routes and campsites. A total of 13 maps cover the coastline between Cape Sorell and Cockle Creek.

During the 2022/23 season, SPRATS crews surveyed and weeded Sectors 1 to 4, 6 and 7. Parts of Sector 5 were weeded by the Sector 7 crew during their helicopter insertion and by a SPRATS affiliated bushwalker. Sector 8 was weeded by SPRATS affiliated bushwalkers. 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 2022/23 weeds had been mapped from 854 sites, made up of 692 sea spurge, 154 marram grass, four blackberry, three Great Mullein and one slender thistle.

SPRATS budget and funds expended

SPRATS has been highly effective at value-added remote-area weed management. To date, for an input of \$362 000 of state and federal grant money, about \$2 381 000 of volunteer labour has been performed, a return of about 6.4 to 1 (Figure 3a)⁶.

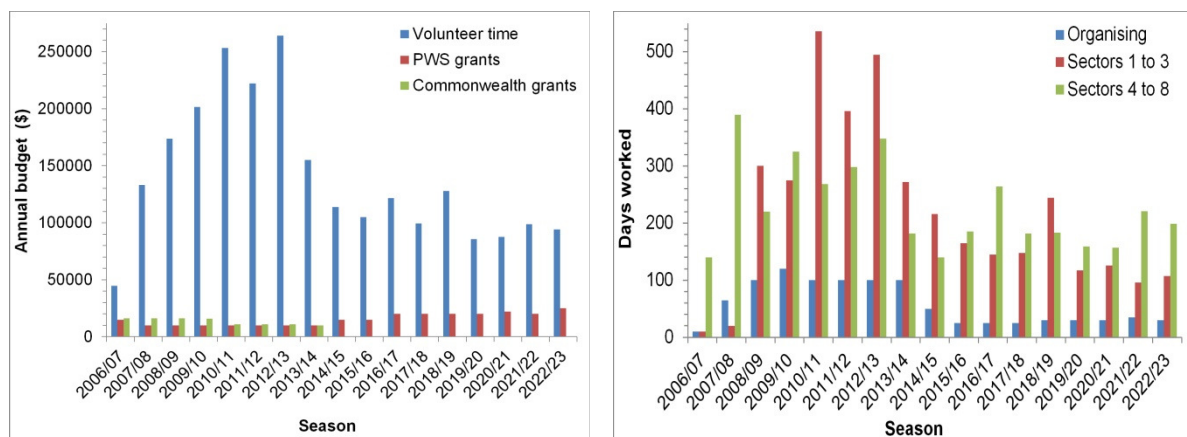
Number of people involved

The number of people involved and work days performed is summarised in Table 2 and Figure 3b.

Table 2. Number of people involved and work days performed between 2006/07 and 2022/23.

Season	Planning	Sectors 1 to 3		Sectors 4 to 8		Totals	
	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
Totals	975		3668		3861		8504

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

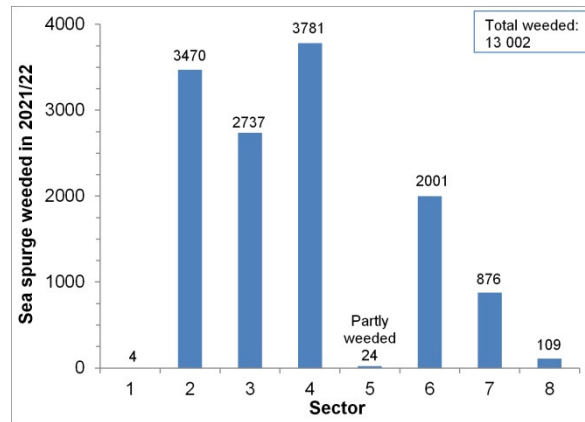
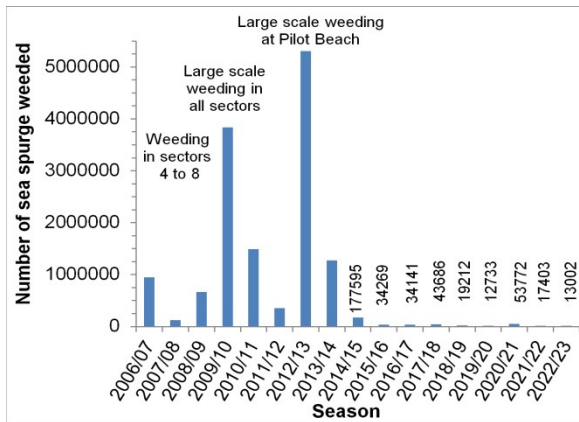


a) budget
b) days worked
Figure 3. SPRATS annual budget and days worked: 2006/07 to 2022/23.

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 \$7 143 000 and the ratio of volunteer to grant money to about 19 to 1.

Sea spurge weeding

During 2022/23, a total of 13 002 sea spurge plants were removed and two new sea spurge sites recorded. To date, SPRATS have removed over 14.4 million sea spurge, reducing the pre-SPRATS number of sea spurge by about 99% (see Table 3; Figures 4a and 4b).



a) Sea spurge weeded 2006/07 to 2022/23
Figure 4. Sea spurge weeding.

b) Sea spurge weeded in 2021/23

Table 3. Number of sea spurge plants weeded between 2006/07 and 2022/23.

Season	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	123142
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
2021/22	*	1164	4656	6816	*	168	4385	214	17403
2022/23	4	3470	2737	3781	** 24	2001	876	109	13002
Totals	93	7549454	4378663	2323145	329	93787	49014	2839	14397348

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



Heading off to work at Stephens Bay in Sector 7

A major issue, recorded in all sectors, is missed sea spurge sites. In its second year, sea spurge produces a large number of seeds which then germinate and/or replenish seed banks. Seedlings from these reactivated sites are responsible for between about a third and half of the number of sea spurge weeded and the rate at which SPRATS is reducing the number of sea spurge is slowing. SPRATS have, however, reduced the number of sea spurge to ecological and geomorphological non-significant levels. Where possible, the GPS grid reference for reactivated sites containing missed plants has been moved to the active location making it easier to perform follow-up weeding.

It appears probable that there are an increasing number 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, this issue should be addressed by large scale spreading of the sea spurge biocontrol which should reduce these very large infestations. It may also be necessary to do targeted releases of the sea spurge biocontrol in the SPRATS area.

Marram grass weeding

In the early years of SPRATS operations, marram grass weeding was given a lower priority than sea spurge weeding. Marram grass identification and weeding is also slower, more laborious and difficult than sea spurge weeding (ie marram grass weeding involves spraying, wiping of individual leaves with herbicide or digging out entire clumps). During recent seasons, improved training in marram grass identification and the use of the monocot specific herbicides (ie haloxyfop with Pulse penetrant) has resulted in a significant increase in the rate of marram grass removal.

In total, about 2795 clumps of marram were sprayed in 2022/23, representing a 98% reduction on the pre-SPRATS number of marram grass clumps.

The biggest issue with marram grass spraying is that the marram grass clumps have thinned out requiring more thorough searching, although the amount of herbicide required has been reduced by over 95% (herbicide mix used - 2021: 1661 l; 2022: 111 l; 2023: 75 l). It is probable that marram grass spraying will be required at Endeavour Beach, Neilson River, Discovery Beach, Dunes Beach and Pilot Beach for about the next three years.

Other weeds

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

The Great Mullein sites near the Shank in Sector 6 need to be targeted in future seasons. With only a few hours work each season it should be possible to eradicate this weed.

An isolated infestation of slender thistles containing several thousand plants was weeded near the western end of New Harbour Beach.

The number of scotch thistles in the SPRATS work area is of concern. Over the past couple of decades scotch thistles have been observed to go through a boom-bust cycle and appear to currently be at high numbers in some locations. This weed will be monitored in future seasons. In addition, comprehensive weeding of scotch thistles is well beyond the capacity of the SPRATS group to perform.



Checking Stephens Blow in Sector 7

Sea spurge biocontrol

A biocontrol agent for sea spurge was approved for use in 2021⁷. This agent has been extensively researched and is 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 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, it is extremely unlikely that the agent will 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 (Figure 5). The lesions typically form 11 or 12 days after infection⁸ and then kill the stem over the following weeks to months.

In October 2021, SPRATS, working in cooperation with the CSIRO, released the biocontrol agent at three test locations in Tasmania (Low Head and Bakers Beach on the north coast and Duck Creek on the central west coast). In November 2022 the biocontrol was released at an additional six sites on the northern and central west coast. In May 2023, it is planned to release the biocontrol at between 10 and 12 sites between Ansons Bay on the northern east coast and Stanley on the northwest coast. At all of these sites, detailed pre and post release data on sea spurge cover, height, health and reproductive status is collected.



a) killed plant at Duck Creek b) stem lesions at Low Head c) old stem lesion at Low Head
Figure 5. Biocontrol impacts on sea spurge plants.

Initial indications are that the biocontrol is resulting in significant impacts, especially at the two north coast sites. At all of the three initial release sites there has been a highly significant reduction in sea spurge health but it is still too early to determine how effective the biocontrol is going to be. The biocontrol is also spreading out from the release sites. The biocontrol also appears to be having major impacts at a release site on Flinders Island where it appears to have spread about eight kilometres over a period of about a year.

SPRATS AGM and planning meeting: Saturday 06 May 2023

The SPRATS AGM will be held at 41 Avon Road South Hobart between 11:00 and 13:00 on 06 May 2023. 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 held. The AGM will be followed by a planning meeting, which will review the weeding strategy for the 2023/24 and the sea spurge biocontrol roll-out in Tasmania.

The meeting will be followed by lunch. Please RSVP to [<sprats.tas@gmail.com>](mailto:sprats.tas@gmail.com) if you are planning to attend so we know numbers.

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>.

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.