Nursery and revegetation protocol for Shrubby samphire

Factsheet | December 2025

Image 1: Shrubby samphire at Port Gawler, this samphire can grow up two metres high.

This nursery protocol is part of a local recovery plan to guide future on-ground actions to increase Shrubby samphire *(Tecticornia arbuscula)* habitat area.

Background

Shrubby samphire occurs in the temperate saltmarsh ecological community around southern Australia, which is an ecological community listed as Vulnerable under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* (TSSC 2013).

Shrubby samphire stands also provide critical habitat for the Slender-billed, or Samphire, thornbill *(Acanthiza iredalei rosinae)*. This thornbill sub-species is classed as Vulnerable under the EPBC Act and also under the *National Parks and Wildlife Act 1972* (TSSC 2015). In 2014 and 2017 significant dieback events occurred that affected the population of Shrubby samphire across southern Australia (Coleman *et al.* 2017).

Taxonomic details

Scientific name: *Tecticornia arbuscula*
Family: CHENOPODIACEAE
Common name: Shrubby samphire, Shrubby glasswort

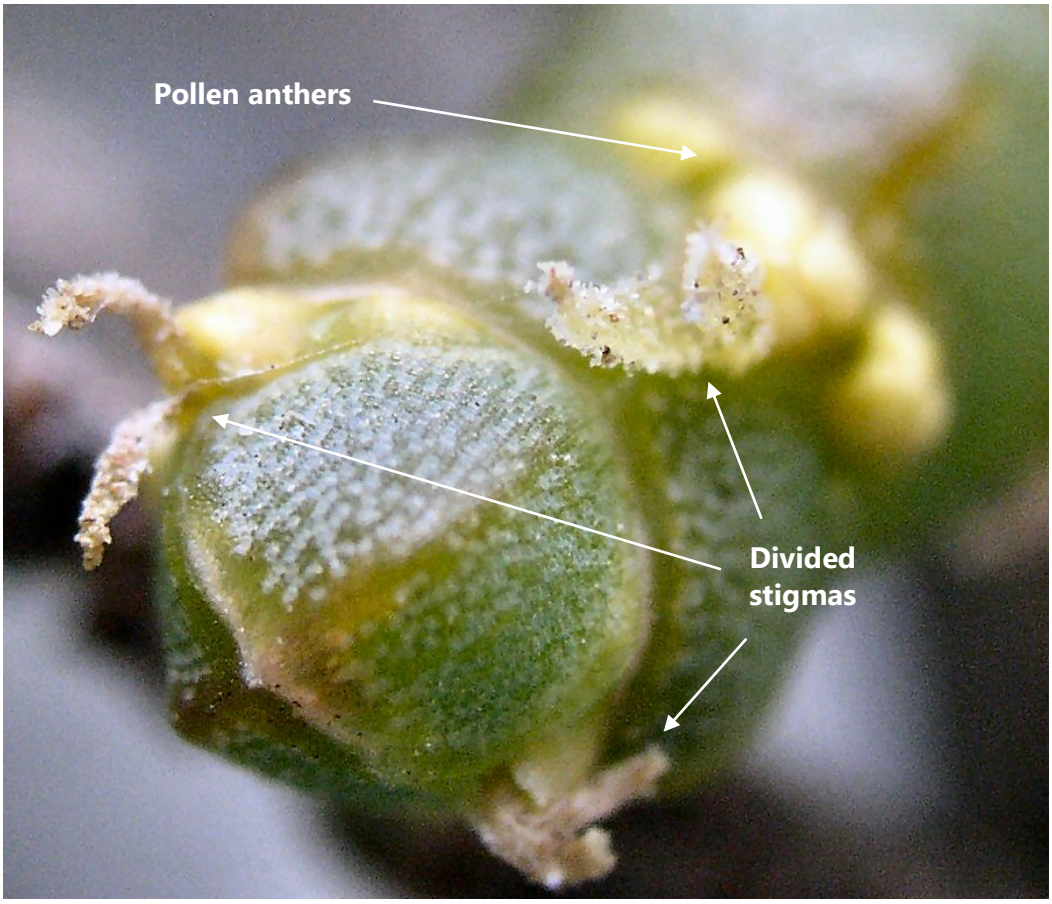

Image 2: Shrubby samphire flowers.

Description

Shrubby samphire is a bushy, erect chenopod shrub with grey woody trunks and branches, commonly 1-2 metres tall. It has small, jointed 'articles' instead of separate stems and leaves.

Flowers are minute and hidden by the bracts. Each triad of flowers has a bisexual central floret and the two outer florets are male.

Habitat

Shrubby samphire is found most commonly in the riparian zone of tidal creeks, just landward of the mangroves where inundation with fresh tidal water is regular, or a little landward on shelly ridges that allow percolation of seawater. The dense branches and ascending form of this species results in the development of dense shrub lands.

Image 3: Flower spikes of shrubby samphire.

Geographic distribution

Intertidal saltmarshes around southern Australia.

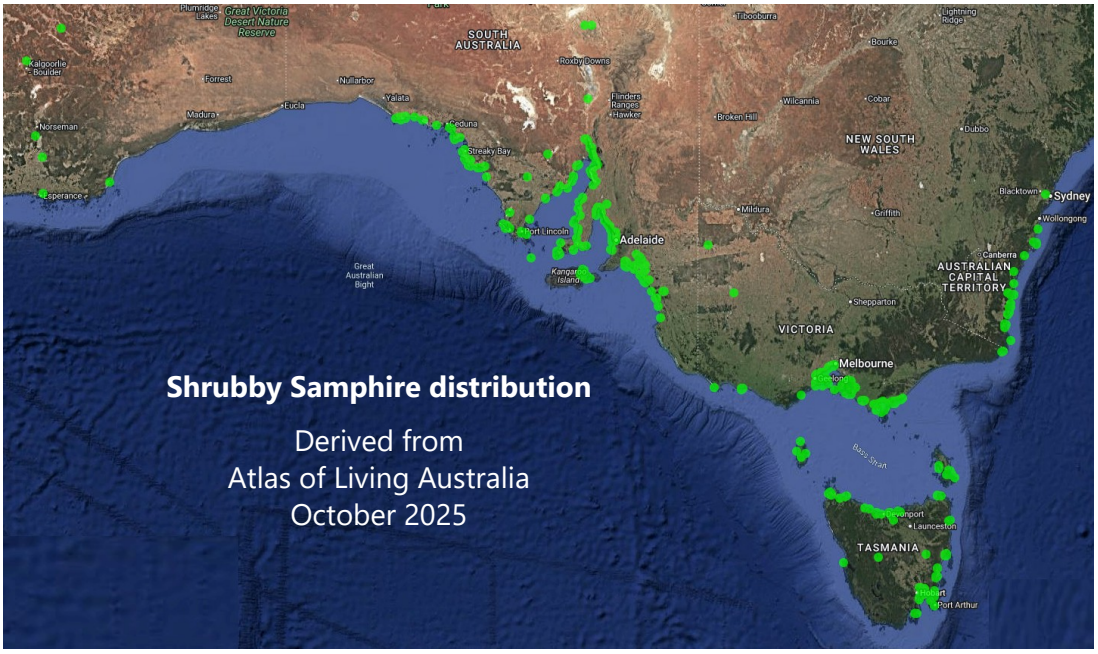

Image 4: Shrubby Samphire distribution as recorded on Atlas of Living Australia @ <www.ala.org.au>.

Methods of propagation

Nursery-reared seedlings and direct seeding appear to be the most successful methods of reproduction so far, with several nurseries reporting easy germination. A few trials of cuttings or in-situ layering have been made, and to date tip cuttings appear more successful than layering.

Calendar

While some seeds may be held on the bushes year-round, collecting plump seeds in summer and drying them in a well-ventilated shady location may result in obtaining a higher percentage of viable seeds.

Studies (Monie 2025a, 2025b) have shown more rapid germination at moderate day/night temperatures (25/15°C and 30/20°C) than at cold (17/7°C) or hot (35/25°C) temperatures, suggesting the best time for sowing would be Spring and Autumn. Where there are hothouses available, the sowing season is potentially able to be extended through Winter (Millbanks unpub).

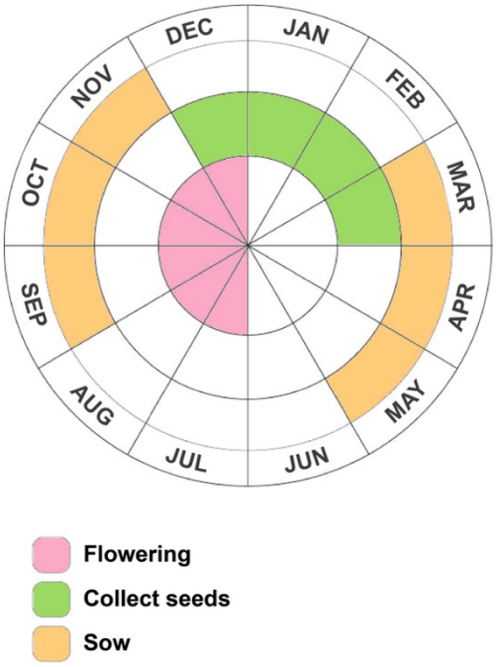

Image 5: Seasonal calendar to guide shrubby samphire seed collection and sewing.

Collecting seed

The maturing seed spike is fleshy, with the remnant woody styles from the flowers remaining (white circles in image 7). Mature fruit spikes are brown, dry and may comprise a single pair of florets or several pairs (green circles in image 7). Harvest the mature (green circles in image 7) fruit spikes.

Seeds are enclosed in a hard, pyramid-shaped pericarp which, once cracked, reveals the narrow 1.5 mm long seed (more than twice as long as they are broad). The seeds are golden brown, transparent and unornamented. Seeds are difficult to extract without damaging, so collect and dry entire fruit spikes.

Processing seed

Seeds of Shrubby samphire are not separated from the fruit, to minimize losses from physical damage to the seed.

Dry seed spikes on muslin covered racks or in porous bags in the shade, at 18°C to 20°C.

Storing seed

Seed aging studies (Monie 2025b) suggest that Shrubby Samphire seeds can form a short-lived but persistent seed bank in natural conditions. Short-lived persistent seedbanks are those that can survive less than 5-6 years or six germination seasons, but longer than one germination season. Shrubby samphire appears to have a seed lifespan in natural conditions that is similar to Silver saltbush *Atriplex bunburyana*, Eichler's saltbush *Atriplex eichleri* or Joint-leaf rush *Juncus holoschoenus*.

Storing seeds in controlled conditions prevents them from 'aging' as fast as they would in a natural, in-soil seed bank. The following instructions are for small scale revegetation nurseries. Commercial or research organisations focused on long-term conservation storage are directed to Sweedman & Merritt 2006 for advice.

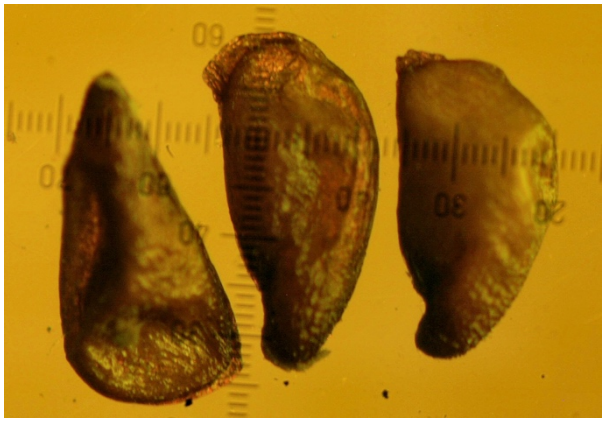

Image 6: Shrubby samphire seeds, approximately 1.5 mm long seeds.

Image 7: Mature fruit spikes of shrubby samphire (circled green), ready for harvest. The woody styles (circled white) are thin stalks which connected reproductive parts of the flower.

Image 8: Covered racks for drying seed.

Image 9: Porous bags for drying seed.

There may be some salt in the air-dried material and so the seed/fruit may attract or hold more moisture than ideal. Prior to storing, the air-dried seed can be further dried by placing in a dehumidifying cabinet for a week. Sealable plastic boxes containing bagged silica gel (desiccant) make economical dehumidifying cabinets. Silica gel is used at 3x the weight of the seed material (Sweedman & Merritt 2006).

Once seed material is dried it needs to be placed in airtight containers to prevent reabsorption of moisture. Screw-top glass jars, metal tins and laminated foil pouches that can be heat sealed are all suitable.

For seed that is to be used within one growing season, storage at ambient temperature in an airconditioned building is sufficient. When storing seed to be used over a 5-10 year period, refrigerators that provide a constant temperature in the 2-5ºC range will maintain viability of the seed material.

Nursery germination

Shrubby samphire appears to have low numbers of viable seeds. Seed fill rates for samples from Hindmarsh Island were 68% (Monie 2025a). For larger institutions, advice on seed testing to determine viability rates prior to use, in (Monie 2025b) or Sweedman & Merrit 2006, could be followed. For smaller, or community, nurseries simply over-sowing with excess seed is a sufficient response to low viability.

Pre-soaking the seed before sowing seems to increase germination success.

It is easy to damage the seeds by attempting to extract them from the individual fruitlets, even after soaking. Therefore, it is recommended to sow the fruitlets or portions of the spikes, rather than trying to extract the seed.

A free-draining potting mix with 15% perlite has been successfully used as a growing medium. A slow-release fertilizer suitable for native plants (low phosphorus) can be used at the rate of approximately 1 cup per barrow of potting mix (Millbanks unpub).

Monie (2025a) found that seeds germinated much better in alternating light and dark than in permanent darkness, so germination trays should be in a location exposed to natural light, with seeds close to, or on top of, the potting mix surface.

Salinity slows down germination and it is recommended to use fresh water to germinate seeds. Studies by Monie (2025a, 2025b) found that using freshwater, over 50% of seeds germinated within a fortnight. In brackish conditions the same percentage took two months to germinate, while when seawater was used there was only 10% germination after a month. In higher salinities there was no germination at all.

Ungerminated seeds that had been exposed to saline waters recovered and germinated after being rinsed and then watered with freshwater. Their ultimate germination rate was higher than those seeds exposed to freshwater only. This 'salt-priming' effect may increase germination rates in circumstances where there are limited supplies of seed available.

Temperature for the best germination appears to be in the daily high/low range of 25/15°C, with reasonable results up to 30/20°C. This is a fairly broad range and suggests both Spring and Autumn are appropriate for germinating the seeds. Hotter days and colder nights restricted germination.

Germination time also appears to depend on how old the seed is. Untreated samples of seed germinated rapidly, with 50% of seeds germinating within 11-12 days. 'Artificially aged' seeds required a longer germination window to start germinating, but then germinated quite rapidly (Monie 2025b).

After germination, Shrubby samphire plants at the Two Wells Community Nursery took a little over two months to reach a size suitable for potting on into forestry tubes. At Hindmarsh Island Landcare Nursery the seeds were germinated in forestry tubes, so transplanting was not required.

Revegetation sites

Revegetation sites need to be at an elevation that receives regular tidal inundation that is within the species' tolerance range of inundation for a maximum of 17% of time on an annualized basis (Fotheringham 1994, Coleman et al. 2017). This is generally in the zone between the area that is wet once daily to the area that is wet once or twice a week.

Regular daily observation of a site over a fortnight will usually be sufficient to identify whether a site will be too wet. Drier sites that receive inundation less than once a week may support Shrubby samphire, if the soil is sandy.

Image 10: Shrubby samphire die off at Middle Beach in 2017. Whilst at some sites, other samphire species have colonised bare ground, despite thorough search efforts in 2024, no shrubby samphire seedlings have been observed.

Areas that may be subject to intermittent long periods of non-tidal inundation, such as intermittently closed lagoons, can be assessed using the model developed by Sinclair *et al* (2022) that suggests Shrubby samphire starts to die after being continuously inundated for more than 10 weeks.

An alternate method for assessing whether a site is suitable for Shrubby samphire is to examine the other plants growing in the vicinity. Shrubby samphire often grows at the lowest elevation on a slope that Heathy bluebush *Maireana oppositifolia* occurs.

Evaluating the existing in-soil seed bank can identify areas where Shrubby samphire seed is being maintained in the soil. These areas may be suitable for augmentation with tubestock, or additional direct seeding. To evaluate the existing seedbank collect soil from different depths in late spring-early summer (after the main germination season), but before dispersal of new season's seeds. Water the collected samples carefully with fresh water to reduce salinity levels and germinate in protected conditions (a greenhouse or cloche).

Direct seeding

Direct seeding can be used in areas that appear to be within the inundation tolerance range of Shrubby samphire, either as a standalone treatment or to augment a tubestock planting. With the relatively short lifespan of seeds of this species in natural conditions, it is not recommended to attempt seed banking uphill in anticipation of sea level rise.

Cuttings and layering

Small 2-3cm long tip cuttings planted in a mixture of peat moss, coarse sand and perlite have been grown successfully by the Understorey Network in Tasmania.

Attempts to layer older branches of Shrubby samphire in the field have not proved successful so far. Layering of a different species, *Tecticornia pergranulata*, was tested in the Two Wells community nursery. That species successfully layered from young plants in open daylight, but specimens grown under shade did not layer successfully (Millbanks unpub).

References and thanks

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Many thanks to Hindmarsh Island Landcare Group for providing seed for the studies conducted by Monie (2025a, 2025b).

This nursery protocol was prepared by Peri Coleman, Delta Environmental Consulting, 2025.

For more information on samphires species please refer to Coleman, P. 2021, Samphires of Greater Adelaide and the Fleurieu Peninsula. Green Adelaide https://cdn.environment.sa.gov.au/greenadelaide/images/DEW-Green-Adelaide-Samphire-Guide_v6-FINAL.pdf

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