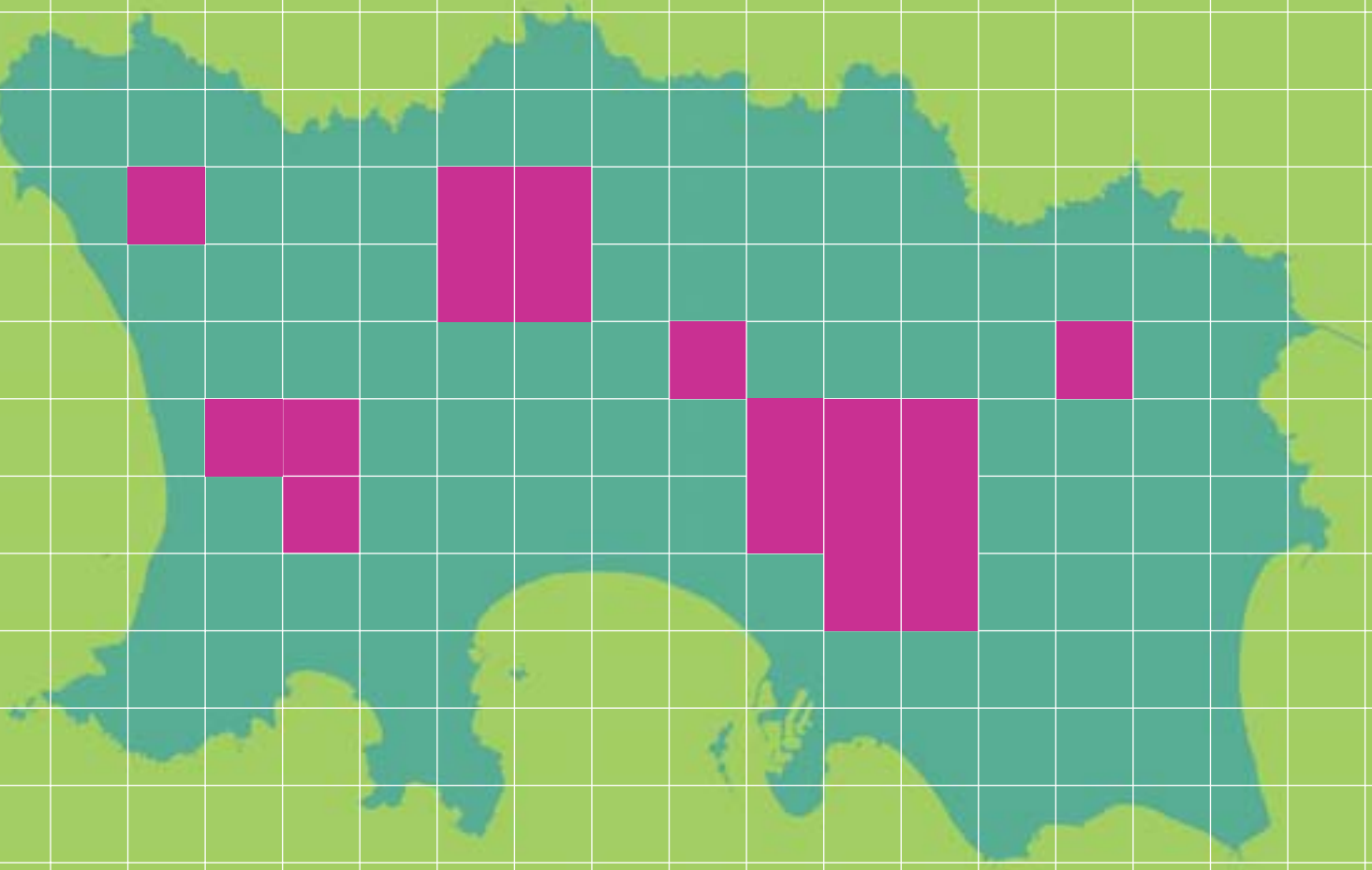
Bio Diversity

Action Plans for Jersey



States of Jersey

Bio Diversity

Contents

Foreword

Acknowledgements

Introduction

Species Action Plans

Plants

Insects

Amphibians

Reptiles

Mammals

Birds

Fish

Annexes

List of abbreviations

List of species, with contact point

Reference List

Foreword

by Freddie Cohen, Minister, Planning and Environment

Jersey is a special place. In the round it has beautiful and dramatic scenery, clean water, a healthy economy, and a positive, motivated community of people who enjoy the many natural riches the Island has to offer.

And these riches are considerable; Jersey supports an abundance and variety of wildlife that is unmatched area for area, anywhere in Europe and our position makes it an important refuge for many species - particularly those making migratory movements or those with large home ranges such as birds, bats and marine mammals.

This complex web of life is under constant threat from the pressures of human activities, as the Environment Division signalled in 2000 in Biodiversity A Strategy for Jersey. As this document made clear, halting the continuing loss of biodiversity by conserving and enhancing Jersey's unique natural habitats requires long term planning and management.

There is now recognition of the importance of the natural environment to both our well-being and to the Island's economy at the highest level of government. One of the six commitments in the Strategic Plan 2006 – 2011 is to 'maintain and enhance the natural and built environment; in doing so Jersey's natural and built heritage is sympathetically managed'. This will be indicated by: 'No loss of indigenous species and a reintroduction of those that have been lost.'

As a result of this commitment, and to fulfil our obligations under the Convention on Biological Diversity the Environment Division, working with our non-governmental partners, has developed a programme of work producing individual plans that set out how to protect all important species and habitats in Jersey. To date, 43 Species Action Plans have been produced – and these represent just the beginning of our efforts to conserve some of Jersey's important and declining species.

The Biodiversity Action Plans will help bring about positive change in Jersey. They will help improve understanding of environmental issues, foster better environmental practices and make environmental information easily accessible for individuals to assess the issues regarding Jersey's species and habitats. But perhaps most importantly it will give everyone a chance to get involved in helping to look after our environment.

By acting now we are planning for the future to ensure that we pass on our environment to future generations in as good as, or better condition than it is now. These actions plans highlight where we are now and where we would like to be in years to come.

Acknowledgements

Thanks are due to the many people and organisations who have contributed to this document, including the Société Jersiaise, The National Trust for Jersey, The Durrell Wildlife Conservation Trust, Action for Wildlife, and students from University College London, the Durrell Institute ,University of Kent and Queen Mary College, University of London.

Special thanks are due to Roger and Margaret Long, Joan Banks, Barry Goldsmith, John Gurnell, Dr Glyn Young, David Jeggo, Markus Handschuh and Shelley Hawkins.

Background

The 2005 'State of Jersey' Report (S.o.J.) laid the foundation for a cohesive environmental strategy for Jersey in fulfilment of commitment four of the Strategic Plan for Jersey 2006-2011 to maintain and enhance the the natural and built environment.

The Report identified twelve environmental perspectives including 'Changes in Biodiversity' (1.4.9 S.o.J.) and conserving changing populations (1.4.11 S.o.J.). Five environmental priorities were developed from these perspectives. The key actions for addressing the environmental priority of 'Changes in the countryside and our natural history' were to develop robust, long term scientific evidence about the likely causes of change.

Indicators of changes in biodiversity and key populations are measured by the Environment Division's monitoring programme. Indicator measures include habitat condition of proposed and existing sites of special interest, and population status of indicator species such as birds and butterflies in a sample of habitats in the island. The monitoring proposals for each of the priority species are detailed in individual action plans.

Identification and monitoring of Key Species

The methods and criteria for the identification of species for which action plans are prepared are fully covered in Section 5 of the Biodiversity Strategy for Jersey. Briefly, a list is prepared of species that are rare or rapidly declining in Jersey.

The process is complicated because very little historical information on changes in population is available, but in future, as more information is gathered, changes will be accurately identified. The outcome of work detailed in this report will also be monitored, giving valuable feedback on effectiveness.

Action Plans –what and why

The decline in species world-wide is well publicised. Jersey has unfortunately also experienced recent local extinctions; the Cirl Bunting was described as fairly well distributed in Jersey in the 1950s, yet its decline as a breeding species has been constant since then, and in 2005 no breeding pairs were recorded. The Toad, unofficial symbol of Jersey is also in serious decline, and many other species are in similar difficulties.

The need to record changes in our natural environment is accentuated by the implications of current predictions about climate change, increases in population and problems with waste disposal. If we know what is happening, effective deployment of resources becomes achievable.

These action plans follow article 8 of the Convention on Biological Diversity and the proposals laid out in the Biodiversity Strategy for Jersey (2000). They aim to set out what problems various locally threatened species face and what we propose to do about it. Naturally education and publicity play a large part in the proposals but a variety of local organisations will be involved in the implementation of these plans.

Implementation

The proposals in these action plans are ambitious and will not be achievable all at once. We would like to hear from individuals or organisations interested in contributing to the implementation of these plans.

Involvement ranges from financial contributions for a particular project or species to a small investigatory project such as a school regularly recording information. Some of the projects involve practical work such as planting and cutting; others involve observing and recording nature on a variety of scales, and technical analysis of the results.

These action plans are in a sense a catalogue of ways that everyone can become involved in helping to preserve Jersey's rich natural environment.

If you have any comments or are interested in becoming involved please contact:
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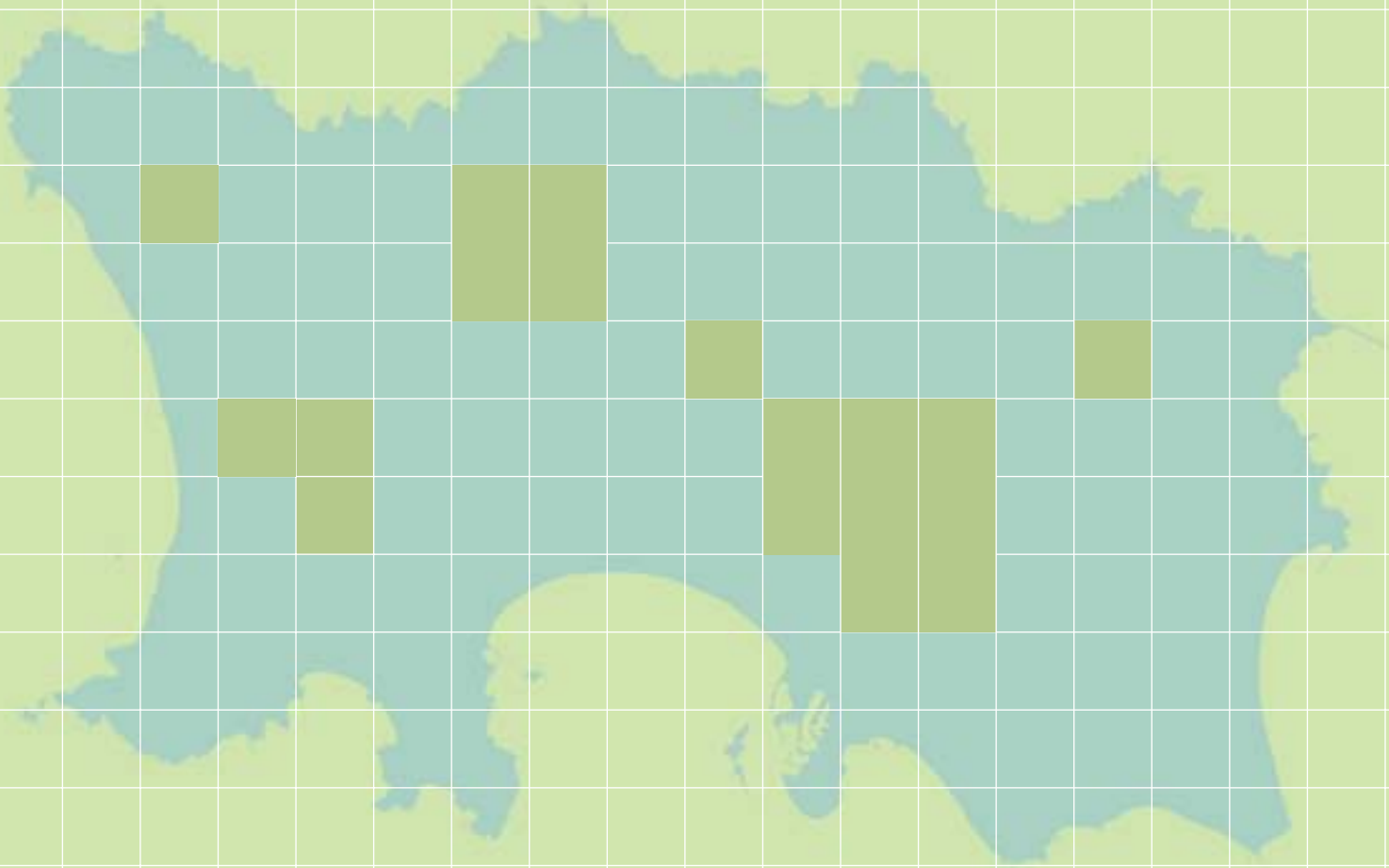
Bio Diversity

Plant Action Plans



Bio Diversity

Brown Galingale

(Cyperus fuscus)

Action Plan

States of Jersey

1. Current status

1.1 *Cyperus fuscus* is found on the margins of ponds and ditches on bare, nutrient-rich mud with a high pH that is seasonally exposed, benefits from some soil disturbance and plants are able to withstand up to one week of inundation by water before death.

1.2 *C. fuscus* grows at L'Ouaisné Pond on the east side of L'Ouaisné Common, Jersey.

1.3 Brown Galingale is currently known from one site in Jersey and from six sites, all in the south, of England. Outside the UK *C. fuscus* is widespread, ranging across Europe, adjacent parts of Africa and much of Asia.

1.4 Brown Galingale is listed on the Long List of Biodiversity: The UK Steering Group Report (1995) as 'internationally threatened 1' (Unfavourable conservation status in Europe). It occurs in 1-5 ten km squares in Great Britain. *C. fuscus* is 'rare' in Jersey.

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Habitat degradation.

2.3 Loss of interconnectivity between pond and ditch sites may have limited the ability of *C. fuscus* to disperse.

2.4 *C. fuscus* exists at a single site, L'Ouaisné, with a high risk of a chance event eliminating the species from the Island.

2.5 Run off water from the road feeds directly into L'Ouaisné Pond. This provides two threats: long term accumulation of toxic chemicals in the pond and the possibility of a major pollution event taking place on the road destroying *C. fuscus*.

2.6 Changes in the water level at L'Ouaisné could result in the habitat becoming unsuitable.

2.7 Grazing of *C. fuscus* by rabbits.

2.8 *C. fuscus* is at risk from grazing feral ducks.

2.9 Overgrowth by other species such as *Phragmites communis*.

2.10 L'Ouaisné has been afforded no statutory site protection.

3. Current action

3.1 Seed from four English sites is held at the Millennium Seed Bank, Wakehurst Place and seed and plants from one other are held at Bristol Botanic Gardens.

3.2 Monitoring of all sites takes place annually.

3.3 PLANTLIFE collates monitoring data from all sites into an annual report.

3.4 The extent of Phragmites is monitored annually. Reeds are cut back to a marked level when they start to encroach on the pond.

4. Action plan objectives and targets

4.1 Establish an ex-situ programme to maintain the genetic diversity of *C. fuscus* in Jersey by 2007.

4.2 Maintain and enhance the population at L'Ouaisné by 2009.

4.3 Introduce a population to a suitable new site and manage this site for *C. fuscus* by 2010.

4.5 Provide statutory or active site protection at L'Ouaisné by 2010.

4.6 Commence research into the impacts of rabbit and duck grazing on the fruiting success of *C. fuscus* at L'Ouaisné by 2010.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 No action proposed.

5.2 Site Safeguard and Management

5.2.1 Submit L'Ouaisné Pond and L'Ouaisné Common for designation as a SSI by 2011. (Action: ED)

5.2.2 Introduce mild annual summer disturbance, if necessary, by 2008 e.g. trampling or drive a vehicle across the site once. (Action: ED - CMT)

5.2.3 Install interceptor to ensure that contaminated water from the road does not flow into the pond at L'Ouaisné by 2012. (Action: ED to negotiate with the relevant States Authority).

5.2.4 Ensure public access to the pond is not increased. (Action: ED - CMT)

5.3. Species Protection and Management

5.3.1 Bring seedlings, from L'Ouaisné, into cultivation by 2007. (Action: ED).

5.3.2 Collect seeds from L'Ouaisné and send them to the Millennium Seed Bank at Wakehurst Place by 2007. (Action ED)

5.3.3 Introduce *C. fuscus* to a new site by 2009. Monitor the new population. (Action: ED)

5.4 Advisory

5.4.1 None proposed.

5.5 Future Research and Monitoring

5.5.1 Continue to monitor the population at L'Ouaisné annually and monitor the new population when introduced. (Action: ED - CMT)

5.5.2 Commence research into the impacts of rabbit and duck grazing on the fruiting success of the population at L'Ouaisné, by 2010. Contact English Nature for advice on the experimental procedure that should be followed. (Action: ED)

5.5.3 Monitor research being undertaken in Britain on other aspects that influence the ecology of *C. fuscus*. (Action: ED)

5.6 Communications and Publicity

5.6.1 Send the monitoring data collected on *C. fuscus* at L'Ouaisné to PLANTLIFE annually. (Action: ED)

5.7 Links with other Action Plans

5.7.1 *C. fuscus* occupies a bare sandy-mud habitat as does the BAP species *Baldellia ranunculoides*. Management at L'Ouaisné for *C. fuscus* would benefit this species should it also appear.

Brown Galingale *Cyperus fuscus*

○ records pre 1984 ● records 1985 - 1998

Distribution of Brown Galingale in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984; 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

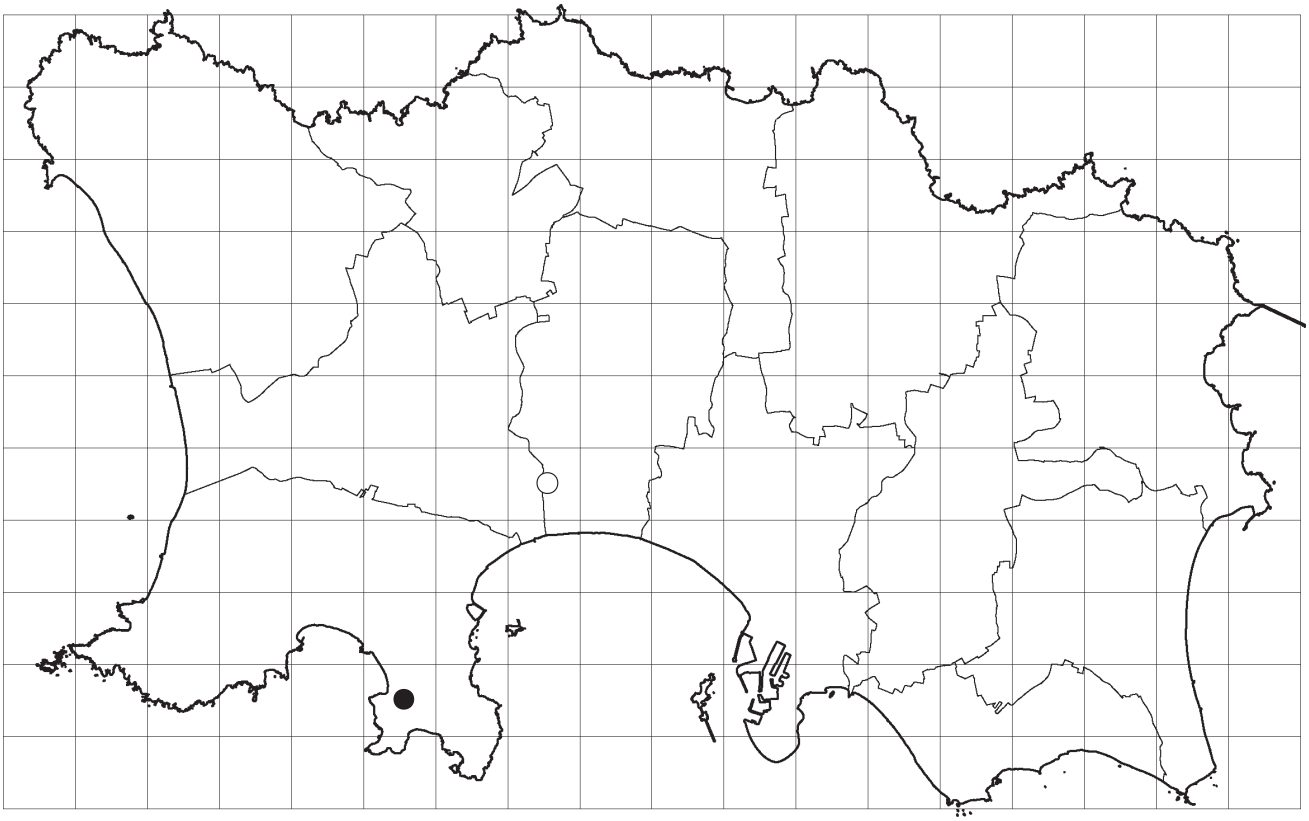


Photo Credit: Roger Long

Bio Diversity

Ivy-leaved Crowfoot

(Ranunculus hederaceus)

Action Plan

States of Jersey

1. Current status

1.1 *Ranunculus hederaceus* inhabits bare mud along at the edge of streams with running water where it usually assumes an annual habit. Its optimal habitat is a layer of sediment, one to several inches thick, rich in nitrogen deposited on sandy subsoil, in water that is only a few centimetres deep, that remains fairly cool in summer and only rarely freezes in winter.

1.2 *R. hederaceus* can also exist under a wide range of ecological conditions, although all waters it inhabits are near eutrophic. Seeds of *R. hederaceus* only germinate where a thin layer of silt, a few centimetres thick, is present. *R. hederaceus* is a poor competitor with a strongly reduced vitality under shaded conditions. The periodic development of stands of *R. hederaceus* is seen most often after the developing vegetation is mown down so as to increase the flow of water. It is not tolerant of very strong currents, and its abundance decreases with increasing water depth. *R. hederaceus* is very sensitive to changes in its habitat and environment.

1.3 *R. hederaceus* has an Atlantic distribution. It is distributed across Atlantic Europe from Portugal northwards to Britain and Ireland. In Jersey *R. hederaceus* has significantly decreased in abundance since the last century. In 1984 it was known from only 4 sites and in 1998 was known from only 2 or 3 sites.

1.4 In Jersey *R. hederaceus* inhabits mainly edges of streams which are often cleaned in autumn, creating ideal conditions for pioneer species. The nutrient-rich conditions where it grows are the result of excessive fertilisation in the adjacent areas. At the time of survey *R. hederaceus* was found at two sites in Jersey but it may exist at three or more.

1.5 *R. hederaceus* is listed on the Long List of Biodiversity: The UK Steering Group Report (1995) as 'internationally threatened 1' (Unfavourable conservation status in Europe). The UK holds 25 - 49% of the world population (BSGR). The species is 'rare' in Jersey.

1.6 In 2005 it is know to be present in five locations. (See map) (M.Long, pers. comm.)

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Reduction in the extent and regularity of ditch clearance.

2.3 Accumulation of deep deposits of silt or mud along streams.

2.4 High water levels in streams.

2.5 Change in the nutrient status of the waters in the streams.

2.6 Herbicide residues released into the water.

2.7 Excessive water velocities.

3. Current action

3.1 All known research on the species has been conducted in the Netherlands. The latest work dates from 1995.

4. Action plan objectives and targets

4.1 Establish an ex-situ programme to maintain the genetic diversity of *R. hederaceus* in Jersey by 2007.

4.2 Maintain and enhance existing populations by 2008.

4.3 Introduce a monitoring programme by 2008.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site Safeguard and Management

5.2.1 Identify with certainty all existing sites by 2006. Undertake management for the species at all these sites. (Action: ED - CMT)

5.2.2 Annually manage streams to ensure that *R. hederaceus* is not out-competed or shaded out by 2008. Negotiate with land owners or the parish to undertake the work. Where necessary put in place management agreements. (Action: ED)

5.2.3 Ensure mud or silt in at least half of the stream is not greater than a few centimetres deep by 2008. Care must be taken not to destroy the whole seedbank whilst doing this. Areas of mud where management has been undertaken should be monitored to ensure seedlings are germinating there. (Action: ED)

5.2.4 Ensure that water levels are maintained within the optimal limits for *R. hederaceus* by 2008. (Action: ED)

5.3 Species Protection and Management

5.3.1 Bring seedlings into cultivation by 2007. (Action: ED)

5.3.2 Collect seeds and deposit them at the Millennium Seed Bank at Wakehurst Place by 2006. (Action: ED)

5.3.3 Restore *R. hederaceus* to two former sites by 2011. This should be carried out using techniques to reactivate the seedbank in these areas. Contact PLANTLIFE for advice on the procedure to use. (Action: ED — CMT)

5.4 Advisory

5.4.1 Advise landowners that *R. hederaceus* is present on their land and advise on appropriate management of the sites by 2007. (Action: ED)

5.5 Future Research and Monitoring

5.5.1 Introduce a monitoring programme to monitor the status of all populations by 2007 (Action: ED).

5.6 Communications and Publicity

5.6.1 Produce a leaflet for landowners highlighting the rarity of *R. hederaceus* in the Island and the importance of biodiversity as a whole by 2006. (Action: ED)

5.7 Links with other Action Plans

5.7.1 There are no direct links with other action plans.

Ivy-leaved Crowfoot *Ranunculus hederaceus*

● records 1985 - 2005

Distribution of Ivy-leaved Crowfoot in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

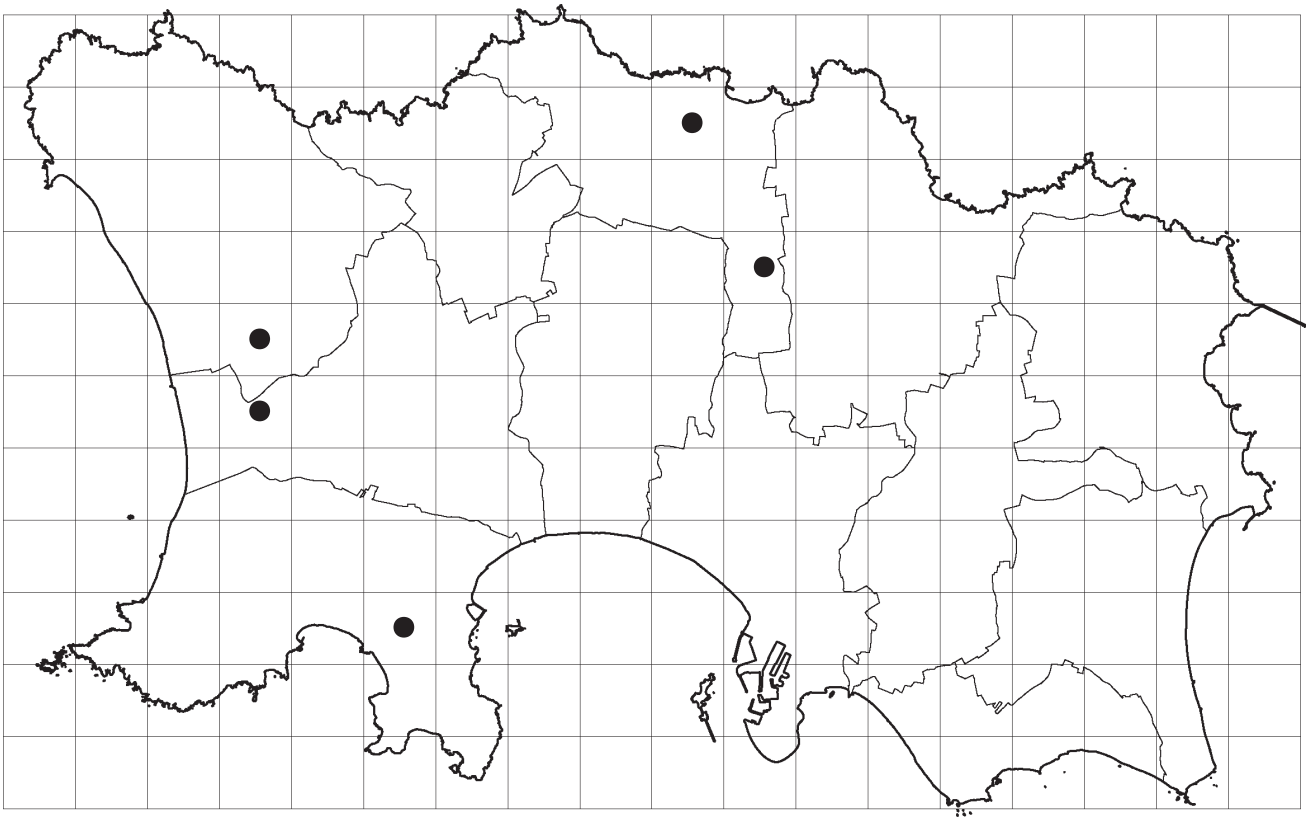


Photo Credit: Roger Long

Bio Diversity

Pale Flax

(Linum bienne)

Action Plan

States of Jersey

1. Current status

1.1 *Linum bienne* is a biennial or perennial with several erect stems bearing pale blue flowers between May and September. The flowers stay open for one day before being dropped from the plant. Pale Flax probably regenerates entirely by seed.

1.2 *L. bienne* occurs on dry permanent grassland on infertile neutral or calcareous soils generally close to the sea. In Jersey it occurs on the thin, nutrient-poor soils around the edge of its main site at Mount Bingham. Its other main site in the Island is on a rough grass slope at Mont Orgueil Castle that is likely to have had the same management for hundreds of years. Pale Flax used to be present on the low dunes in Jersey, which provided the nutrient-poor, infertile substrate required by *L. bienne*.

1.3 Pale Flax is distributed throughout western and southern Europe, Madeira and the Canary Islands.

1.4 In 1851 *L. bienne* was recorded as common in Jersey but by 1903 it was thought to be only frequent. From then on Pale Flax is thought to have become progressively rarer over the years, being known about from 14 coastal sites in 1984. It was badly affected by the storms in 1989 which flooded large areas of St Ouen's Bay with salt water and by 1998 was reduced to a total of three sites in the Island.

1.5 In Jersey *L. bienne* is native in open grassland by the sea.

1.6 *L. bienne* is listed in as having 'rapidly declined' in Jersey. Its present status is 'locally rare'.

2. Current factors causing loss or decline

2.1 Change or lack of management at sites.

2.2 Non-removal of cuttings after mowing of sites.

2.3 Salt spray.

2.4 Competition from *Rosa pimpinellifolia* on the dunes.

2.5 Grazing by rabbits on the dunes.

3. Current action

3.1 The States of Jersey Parks and Gardens Service manage Mount Bingham sympathetically for the conservation of *L. bienne*.

4. Action plan objectives and targets

4.1 Establish a monitoring programme for all known populations by 2006.

4.2 Establish an ex-situ programme to maintain the genetic diversity of *L. bienne* in Jersey by 2006.

4.3 Maintain and enhance all extant populations by 2007.

4.4 Establish a research programme to investigate what is limiting *L. bienne* in the dunes by 2010.

4.5 Restore *L. bienne* to two former sites, at least one of which should be in the dunes, by reactivation of the seed bank or by reintroduction by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site Safeguard and Management

5.2.1 Ensure that management at all extant sites for this species is beneficial for its conservation, by 2006 (Action: ED). Management should include a suspension of mowing at sites until *L. bienne* has flowered and set its seed; removal of all grass cuttings following mowing; and no application of inputs such as fertilisers or herbicides to the sites.

5.2.2 Implement management at St Aubin's Fort that is beneficial for the conservation of *L. bienne*, by 2006. (Action: ED)

5.3 Species Protection and Management

5.3.1 Bring seedlings into cultivation by 2006. (Action: ED)

5.3.2 Collect seeds and deposit them at the Millennium Seed Bank at Wakehurst Place by 2006. (Action: ED)

5.3.3 Exactly identify, the former sites where *L. bienne* existed in the 1980s. At two of the most suitable sites undertake management to regenerate plants from the seed bank, by 2011 (Action: ED). PLANTLIFE should be consulted on suitable techniques to use. One of these sites should be in the dunes. If this work fails then a reintroduction programme should be considered. The areas where work takes place on the dunes should be surrounded by rabbit-proof fences.

5.4 Advisory

5.4.1 Conduct research into the effects of *Rosa pimpinellifolia* and rabbit grazing on the abundance of *L. bienne* in the dunes by 2010. (Action: ED)

5.5 Communications and Publicity

5.5.1 Produce a leaflet highlighting the rarity of *L. bienne* in the Island and the importance of biodiversity as a whole.

5.5.2 Monitor all extant populations to ensure that management is having a beneficial effect by 2006. (Action: ED)

5.5.3 Issue the leaflet to landowners with *L. bienne* sites by 2006. (Action: ED)

5.6 Future Research and Monitoring

5.6.1 None proposed.

5.7 Links with other Action Plans

5.7.1 This action plan is not linked with any others.

5.7.2 Inform landowners that the species is present on their land and advise on how it should be managed by 2006. (Action: ED)

Pale Flax *Linum bienne*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Pale Flax in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

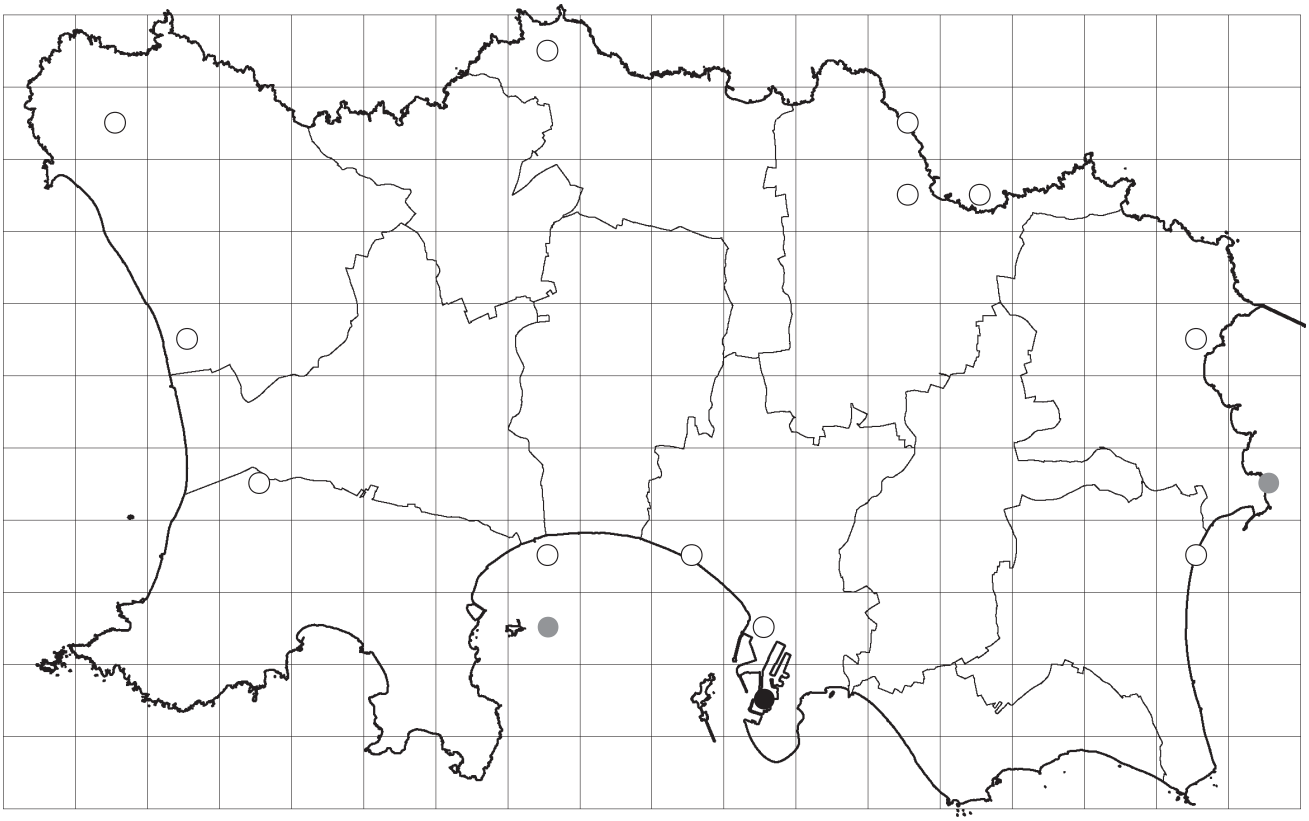


Photo Credit

Bio Diversity

Marsh St John's-wort

(Hypericum elodes)

Action Plan

States of Jersey

1. Current status

1.1 *Hypericum elodes* is a creeping, low, short, greyish-green perennial. The leaves are rounded and covered in silky hairs which prevent them from becoming wetted in aquatic habitats. These are held on flowering stems up to 40 cm high and often exist in dense floating mats. The pale yellow flowers appear between June and September and possess sepals that are red-dotted at their margins.

1.2 *H. elodes* occupies damp, muddy habitats, shallow water, heaths, bogs, ponds and stream margins. It is always found on acid soils.

1.3 It is distributed from Britain through Belgium, Holland, France and Germany to Italy as well as in the Azores.

1.4 In 1903 *H. elodes* was recorded as 'not common' in Jersey. By 1984 Marsh St John's Wort was noted as disappearing as the marshy places which are its habitat were drained or were becoming overgrown because of a lack of grazing animals. At that time it had been reduced to about six sites in the Island. In 1998 *H. elodes* could not be found at L'Ouaisné, although it may well reappear there and only three extant sites in the Island are known.

1.5 *H. elodes* occupies the bare mud and shallow water at the margins of ponds and streams in Jersey.

1.6 *H. elodes* is listed in this document as having 'declined' in Jersey. Its present status is 'rare' in the Island.

1.7 It has been found at L'Ouaisné every year since 1998.

2. Current factors causing loss or decline

2.1 Loss of wetland sites.

2.2 Degradation of sites.

2.3 Decline in water quality.

3. Current action

3.1 Great Fen-sedge, *Cladium mariscus*, is removed when it occurs in Le Canné du Squez.

3.2 Le Canné du Squez is within the Les Landes Biological SSI.

3.3 No known research is taking place on the species at present.

4. Action plan objectives and targets

4.1 Establish a monitoring programme for all known populations by 2006.

4.2 Maintain and enhance extant populations by 2007.

4.3 Establish an ex-situ programme to maintain the genetic diversity of *H. elodes* in Jersey by 2007.

4.4 Restore *H. elodes* to one former site by reactivation of the seed bank or reintroduction by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 Continue to safeguard the status of the Les Landes SSI area.

5.2 Site Safeguard and Management

5.2.1 Prevent excessive branchage of the site at Bouley Bay by 2006. (Action: ED)

5.2.2 Ensure dead plant material following the branchage at the Bouley Bay site is removed by 2006. (Action: ED)

5.2.3 Remove selective stools of *Molinia* from the pond at Le Canné du Squez by 2007. (Action: ED - CMT)

5.2.4 Improve water quality, by reducing the nutrient load of the stream, at Le Canné du Squez by 2013. (Action: ED)

5.3 Species Protection and Management

5.3.1 Bring seedlings into cultivation by 2007. (Action: ED)

5.3.2 Collect seeds and deposit them at the Millennium Seed Bank at Wakehurst Place by 2007. (Action ED)

5.4 Advisory

5.4.1 None proposed.

5.5 Future Research and Monitoring

5.5.1 Monitor the depth and width of the open water areas of the pond at Le Canné du Squez, by 2006. When infilling begins to significantly decrease the habitat available to *H. elodes* the pond should be widened and deepened. This should be done in stages to maintain the seed bank. Note that shallow margins should always be left for the species. Work to be carried out at the discretion of the Countryside Manager. (Action: ED - CMT)

5.5.2 Monitor all populations of *H. elodes* annually with a view to refining conservation management techniques, by 2006. (Action: ED)

5.5.3 Investigate whether the site at Bouley Bay suffers from trampling, by 2007. (Action: ED)

5.6 Communications and Publicity

5.6.1 None proposed.

5.7 Links with other Action Plans

5.7.1 The implementation of this Action Plan will benefit the BAP species *Scutellaria minor* and *Baldellia ranunculoides*.

Marsh St John's-wort *Hypericum elodes*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Marsh St John's-wort in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

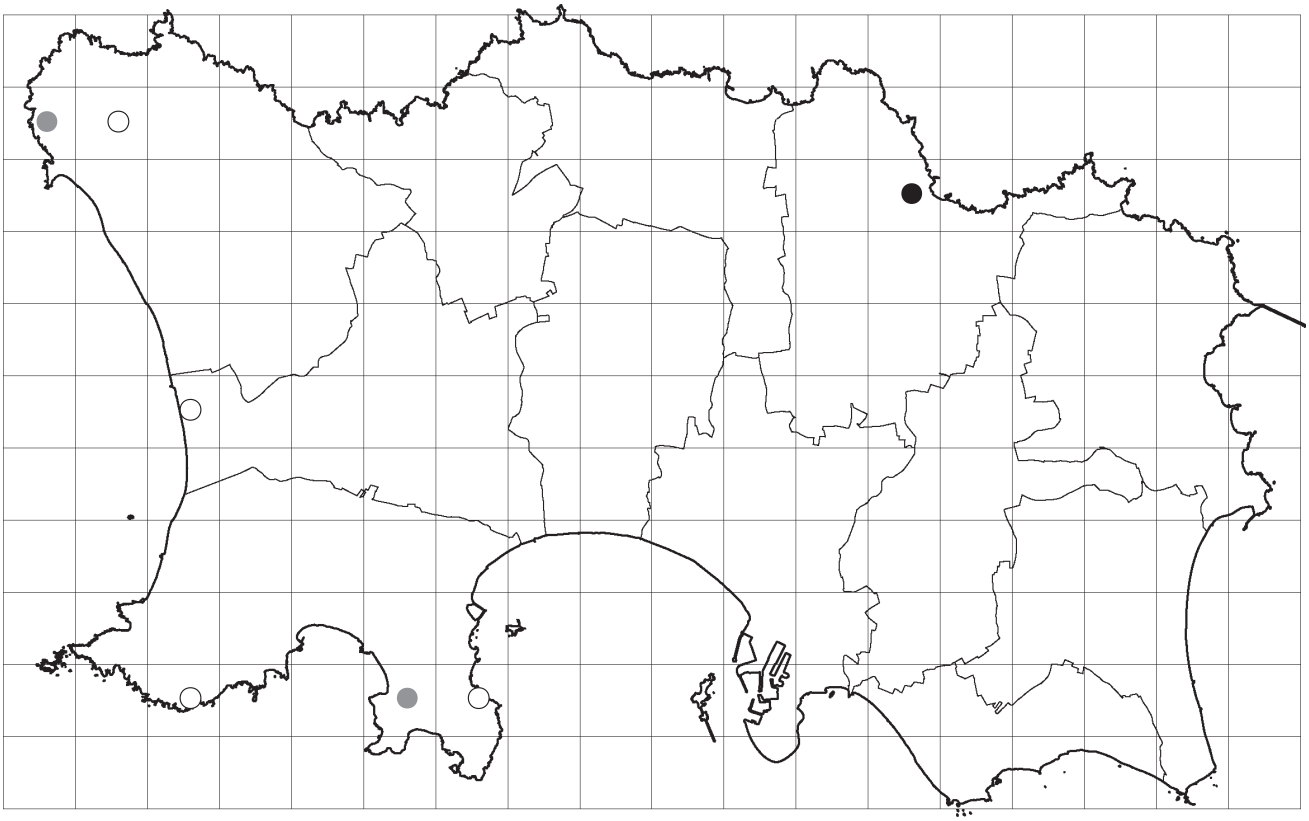


Photo Credit: John Pinel

Bio Diversity

Lesser Skullcap

(Scutellaria minor)

Action Plan

States of Jersey

1. Current status

1.1 *Scutellaria minor* is a low/short perennial bearing lanceolate leaves that are scarcely toothed. It produces pale pinkish-purple flowers, which are positioned in pairs up the stem, and appear between July and October.

1.2 Lesser Skullcap inhabits wet heaths and woodland rides on peaty or mineral rich soils that are infertile - very infertile and acidic, varying typically between pH 5.9 and 4.6.

1.3 *S. minor* is distributed from southern Sweden through eastern Germany and western Italy in Europe and is present in the Azores.

1.4 *S. minor* was recorded as rare in Jersey in 1903. In 1984 it was noted that it 'is still in good quantity in some of the boggy places on or near cliffs'. At that time *S. minor* was present in at least 6 sites in the Island. In 1998 Lesser Skullcap was known from only two sites in the Island.

1.5 *S. minor* has traditionally been found in boggy places on or near the cliffs in Jersey. It now exists at one marsh site near the coast and in the boggy area surrounding a Lavoir.

1.6 In Jersey Lesser Skullcap is 'rare'.

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Degradation of sites.

3. Current action

3.1 Advance of bracken and bramble into L'Ouaisné marsh is controlled.

3.2 Water quality is monitored from areas adjacent to L'Ouaisné marsh.

4. Action plan objectives and targets

4.1 Establish a monitoring programme for *S. minor* by 2006.

4.2 Maintain and enhance populations at both extant sites by 2007.

4.3 Establish an ex-situ programme to maintain the genetic diversity of *S. minor* in Jersey by 2007.

4.4 Restore *S. minor* to 2 former sites by reactivation of the seed bank or reintroduction by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site Safeguard and Management

5.2.1 Continue to control the advance of bracken into L'Ouaisné marsh by 2006. (Action: ED - CMT)

5.2.2 Remove scrub from the marsh at L'Ouaisné at the discretion of the Countryside Manager. (Action: ED - CMT)

5.2.3 Continue to manage water levels at L'Ouaisné Marsh for the community type presently found there by 2006. (Action: ED - CMT)

5.2.4 Continue to monitor water quality from the L'Ouaisné area by 2006. (Action ED - CMT)

5.2.5 Remove selected stools of *Molinia* from L'Ouaisné marsh, by 2007. Stools should be removed at the discretion of the Countryside Manager. (Action: ED - CMT)

5.2.6 Ensure that the branchage at Les Charrières de Boulay is not repeated at regular intervals as is the case now, by 2006. Branchage should only be carried out at the normal branchage dates. Further, the boggy area around the stream and Lavoir should only be lightly branchaged. (Action: ED)

5.2.7 Ensure dead plant material following the branchage, at Les Charrières de Boulay, is removed annually. (Action: ED)

5.3 Species Protection and Management

5.3.1 Bring seedlings into cultivation by 2007. (Action: ED)

5.3.2 Collect seeds and deposit them at the Millennium Seed Bank at Wakehurst Place by 2007. (Action: ED)

5.3.3 Restore *S. minor* to two of its former sites by 2011. Identify the exact locations of former sites and, at sites that still offer suitable conditions for *S. minor*, carry out work to reactivate the seed bank. PLANTLIFE should be consulted on suitable techniques to use for this procedure. (Action ED)

5.4 Advisory

5.4.1 None proposed.

5.5 Future Research and Monitoring

5.5.1 Investigate whether the site at Les Charrières de Boulay suffers from trampling by 2007. Hill climb races are held several times a year at this site and spectators line the hill. If research shows spectators are trampling the site it should be fenced off on race days. (Action: ED)

5.5.2 Monitor all populations of *S. minor* annually in August with a view to refining conservation management techniques by 2006. (Action ED)

5.5.3 Monitor the advance of scrub, especially willow, into the marsh at L'Ouaisné by 2006. (Action: ED)

5.6 Communications and Publicity

5.6.1 No action proposed

5.7 Links with other Action Plans

5.7.1 The implementation of this Action Plan will benefit the BAP species *Hypericum elodes*. It occurs at Les Charrières de Boulay with *S. minor* and at L'Ouaisné marsh. Management of this area for *S. minor* will also benefit *H. elodes*.

Lesser Skullcap *Scutellaria minor*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Lesser Skullcap in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

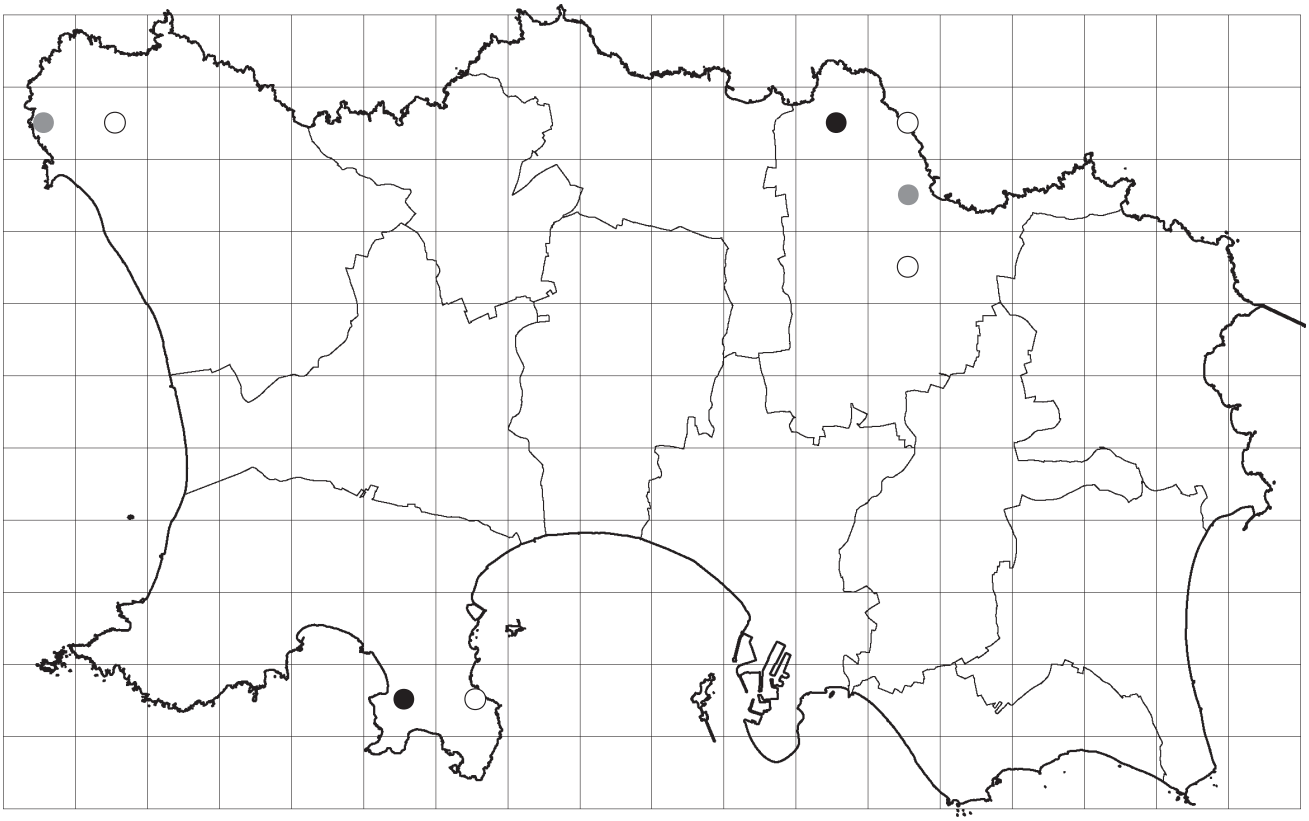


Photo Credit: Roger Long

Bio Diversity

Common Toadflax

(Linaria vulgaris)

Action Plan

States of Jersey

1. Current status

1.1 *Linaria vulgaris* is an herbaceous-perennial, with erect stems and branched, linear leaves. Flowering occurs from July to October. It is insect pollinated, mainly by bumblebees and halicid bees, and fruit production occurs in September, the seeds being dispersed by wind, water or ants. *L. vulgaris* is able to spread vegetatively, the creeping root-stock hosting adventitious buds from which large but diffuse clonal patches are formed.

1.2 Common Toadflax is restricted to sites where the growth of more robust perennials is restricted.

1.3 It is found across the majority of Europe and Asia and has been introduced to Japan, Australia, New Zealand, South Africa, Jamaica, Chile and North America.

1.4 In 1903 *L. vulgaris* was frequent in Jersey in its then habitat of fields and hedges. By 1984 its habitat was restricted to hedgebanks where it occurred in at least 54 different sites in the Island. The situation in 1998 was that *L. vulgaris* was known from 9 sites.

1.5 The habitats of *L. vulgaris* in Jersey are mainly hedgebanks and verges.

1.6 *L. vulgaris* is listed in this report as having 'rapidly declined' in Jersey. Its present status is 'locally scarce'. It is a 'locally distinct' species.

2. Current factors causing loss or decline

2.1 Harsh branchage of hedges, hedgebanks and verges with tractor-mounted flails and strimmers.

2.2 Non-removal of dead plant material following the branchage.

2.3 The timing of the second branchage.

2.4 Increase in the density of the sward of the hedge bottom flora.

2.5 Change in agricultural practice from cutting for hay to cutting for silage, and the addition of chemicals to the fields.

2.6 Overspray of inputs from agricultural fields.

3. Current action

3.1 Research is being undertaken in Canada on *L. vulgaris*.

3.2 Area managers are aware of the presence of *L. vulgaris* on some sites owned or managed by the States of Jersey. These areas are managed sympathetically for *L. vulgaris*.

4. Action plan objectives and targets

4.1 Maintain and enhance all existing populations.

4.2 Increase the size of all existing populations by 2010.

4.3 Publish a set of guidelines on good branchage practice by 2009. Enforce this with legislation if it is thought this would be effective.

4.4 Restore *L. vulgaris* to three of its former sites by 2010.

4.5 Facilitate natural colonisation of new sites by 2011.

4.6 Set up a series of experiments to determine the branchage practice that is most beneficial for the hedge bottom flora by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 Enforce point 4.3 by legislation if it is felt this would be effective.

5.2 Site Safeguard and Management

5.2.1 Put in place management agreements at all known *L. vulgaris* sites by 2009. (Action: ED)

5.2.2 Agreements should include an obligation for the landowner to manage the population of *L. vulgaris* on his land according to the 'best branchage practice guide for hedge bottom flora' (see point 5.6.1) and to implement the following recommendations:

1. The branchage avoids the individuals of *L. vulgaris*.
2. The hedge bottom flora is branchaged only lightly.
3. All dead plant material, following the branchage, is removed from the hedgebanks.
4. Ensure the sward remains relatively open at the existing sites where *L. vulgaris* is found (5.2.1).

5.2.3 Ensure that these management agreements are carried out. (Action: ED)

5.2.4 Encourage all farmers in the Island to provide, input free, 'wildlife headlands'. Provide incentives for farmers to leave these headlands where their fields are adjacent to populations of *L. vulgaris* by 2011. (Action: ED)

5.3 Species Protection and Management

5.3.1 Distribute guidelines on 'best branchage practice for hedge bottom flora' (see point 5.6.1) to all landowners in the Island and encourage their recommendations to be implemented by 2009. (Action: ED)

5.3.2 Restore *L. vulgaris* to three of its former sites by reactivation of the existing seed bank by 2010. PLANTLIFE should be contacted for advice on this procedure. (Action: ED)

5.3.3 Monitor the literature for new research being produced about *L. vulgaris*.

5.4 Advisory

5.4.1 Inform landowners who own sites where *L. vulgaris* exists, of the presence of the species on their land and of the action they should take (as per point 5.2.1), by 2006. (Action: ED)

5.5 Future Research and Monitoring

5.5.1 Undertake monitoring on a representative number of extant sites with a view to refining conservation management techniques by 2007. Where possible monitoring visits should be combined with meeting landowners to discuss conservation management. (Action: ED)

5.6 Communications and Publicity

5.6.1 Produce a leaflet titled 'Best branchage practice for hedge bottom flora' or similar. Distribute to land owners in the Island by 2009. Why these guidelines should be followed should be emphasised in the context of the Island Biodiversity Strategy (5.6.1). (Action: ED)

5.6.2 The guidelines should include recommendations on how the branchage is to be performed and actions to be taken following the branchage.

5.7 Links with other Action Plans

5.7.1 The recommendations for branchage practice presented here will benefit the BAP Species *Fragaria vesca* and *Anogramma leptophylla*.

Common Toadflax *Linaria vulgaris*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Common Toadflax in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

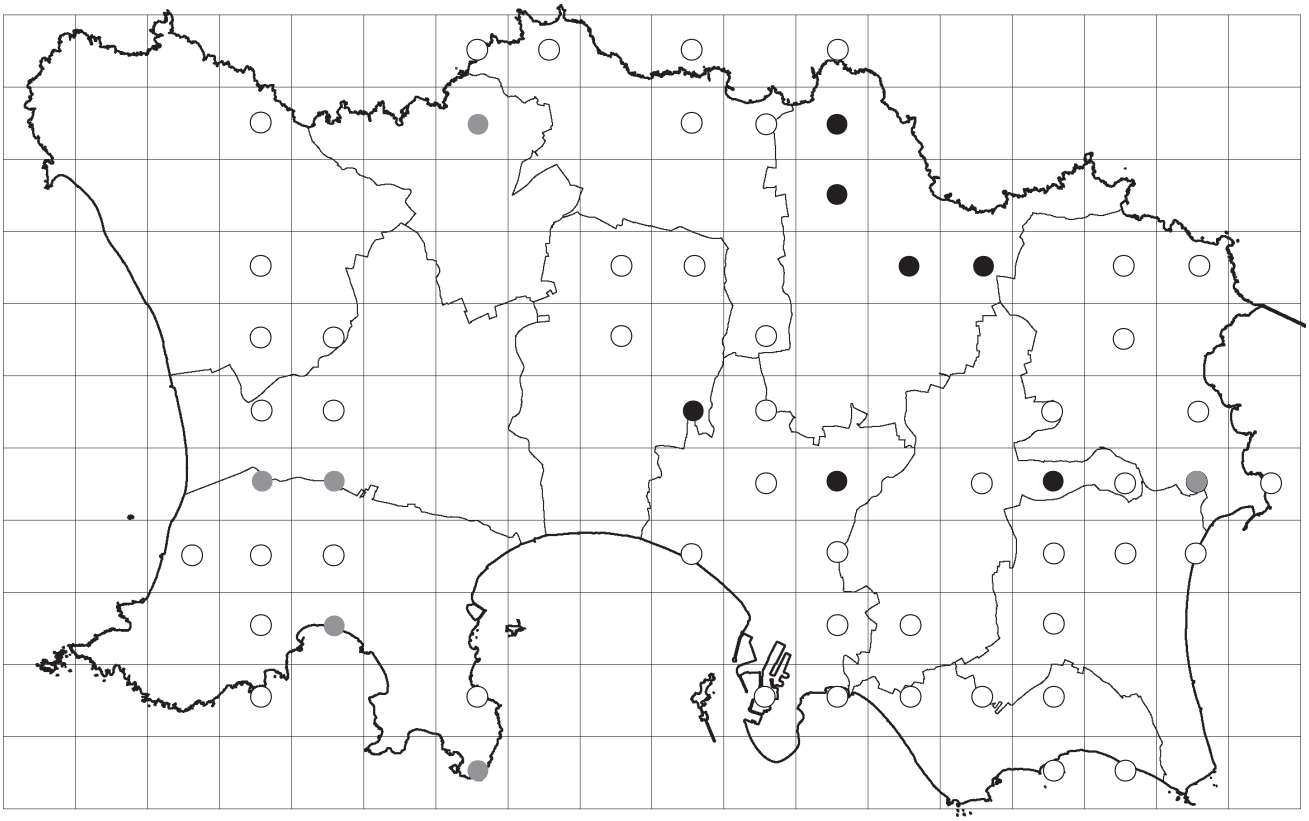


Photo Credit: Alistair Baxter

Bio Diversity
Wild Strawberry
(Fragaria vesca)
Action Plan

States of Jersey

1. Current status

1.1 *Fragaria vesca* is a low/short perennial with bright green, trefoil leaves and long runners rooting at intervals. It bears insect pollinated white flowers between April and June and small 'strawberry' fruits, dispersed by birds, from June to July. Regeneration is mainly vegetative by long stolons and large clonal patches can be formed. Regeneration by seed is mainly of importance when colonising new sites.

1.2 *F. vesca* exploits sites where the vigour of potential dominants is suppressed by moderately low fertility and where there is often a rocky substrate or moderate shade from a tree canopy, or both. The species is particularly characteristic of open turf in situations where, despite the shallow soil, the incidence of droughting is slight. The habitat range of *F. vesca* includes sites such as woodland margins, scrub, shady banks and hedgerows.

1.3 The distribution of Wild Strawberry includes the British Isles, most of Europe, Asia and North America.

1.4 In 1984 *F. vesca* was termed 'frequent in Jersey', being known then from at least 40 sites in the Island. Its decline was noted by the Société Jersiaise in 1995 and in 1998 *F. vesca* was known from only 8 sites.

1.5 The main sites for *F. vesca* in Jersey are hedgebanks in the interior.

1.6 *F. vesca* is listed in this report as having 'rapidly declined' in Jersey. Its present status in Jersey is 'scarce'. It is a 'locally distinct' species.

2. Current factors causing loss or decline

2.1 Non-removal of dead plant material following the branchage.

2.2 Harsh branchage of hedges, hedgebanks and verges with tractor driven flails and strimmers.

2.3 Overspray of inputs from fields.

3. Current action

3.1 The Société Jersiaise is monitoring the distribution of Wild Strawberry in the Island.

4. Action plan objectives and targets

4.1 Maintain and enhance all extant populations by 2009.

4.2 Produce and issue to all land owners a set of guidelines on good branchage practice, by 2009. Enforce this with legislation if it is thought this would be effective.

4.3 Increase the size of all populations by 2010.

4.4 Facilitate natural colonisation of new sites by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 Enforce point 4.2 by legislation if it is felt this would be effective.

5.2 Site Safeguard and Management

5.2.1 Put in place non-statutory management agreements at all known *F. vesca* sites by 2009. (Action: ED)

5.2.2 These agreements should require the landowner to manage the population of *F. vesca* on his land according to the 'best branchage practice guide for hedge bottom flora' (see point 5.6.1) and to implement the following recommendations:

1. All branchage material is removed from the hedgebanks.
2. The branchage avoids the patches of *F. vesca*.
3. The hedge bottom flora is branchaged only lightly.
4. Ensure the sward remains relatively open at the existing sites where *F. vesca* is found.

5.2.3 Ensure that management agreements are carried out. (Action: ED)

5.2.4 Encourage all farmers in the Island to provide, input free, 'wildlife headlands'. Provide incentives for farmers to leave these headlands where their fields are adjacent to populations of *F. vesca* by 2011. (Action: ED)

5.3 Species Protection and Management

5.3.1 Distribute guidelines on 'best branchage practice for hedge bottom flora' (see point 5.6.1) to all landowners in the Island and encourage their recommendations to be implemented by 2009. (Action: ED)

5.3.2 Monitor the literature for new research being produced about *F. vesca*.

5.4 Advisory

5.4.1 Inform landowners who own sites, where *F. vesca* exists, of the presence of the species on their land and of the action they should take by 2007. (Action: ED)

5.5 Future Research and Monitoring

5.5.1 Undertake monitoring at a representative number of extant sites with a view to refining conservation management techniques by 2007. Where possible monitoring visits should be combined with meeting landowners to discuss conservation management. (Action: ED)

5.6 Communications and Publicity

5.6.1 Produce a leaflet titled 'Best branchage practice for hedge bottom flora' or similar and distribute this to land owners in the Island by 2009. The guidelines should include recommendations on how the branchage is to be performed i.e. a less harsh cut of the main hedge so as to leave some shade present; only a light cut of the hedge bottom flora and very importantly, actions following the branchage i.e. that all material should be removed from the hedges and banks. (Action: ED)

5.7 Links with other Action Plans

5.7.1 The recommendations for branchage practice presented here will benefit the BAP Species *Linaria vulgaris* and *Anogramma leptophylla*.

Wild Strawberry *Fragaria vesca*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Wild Strawberry in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

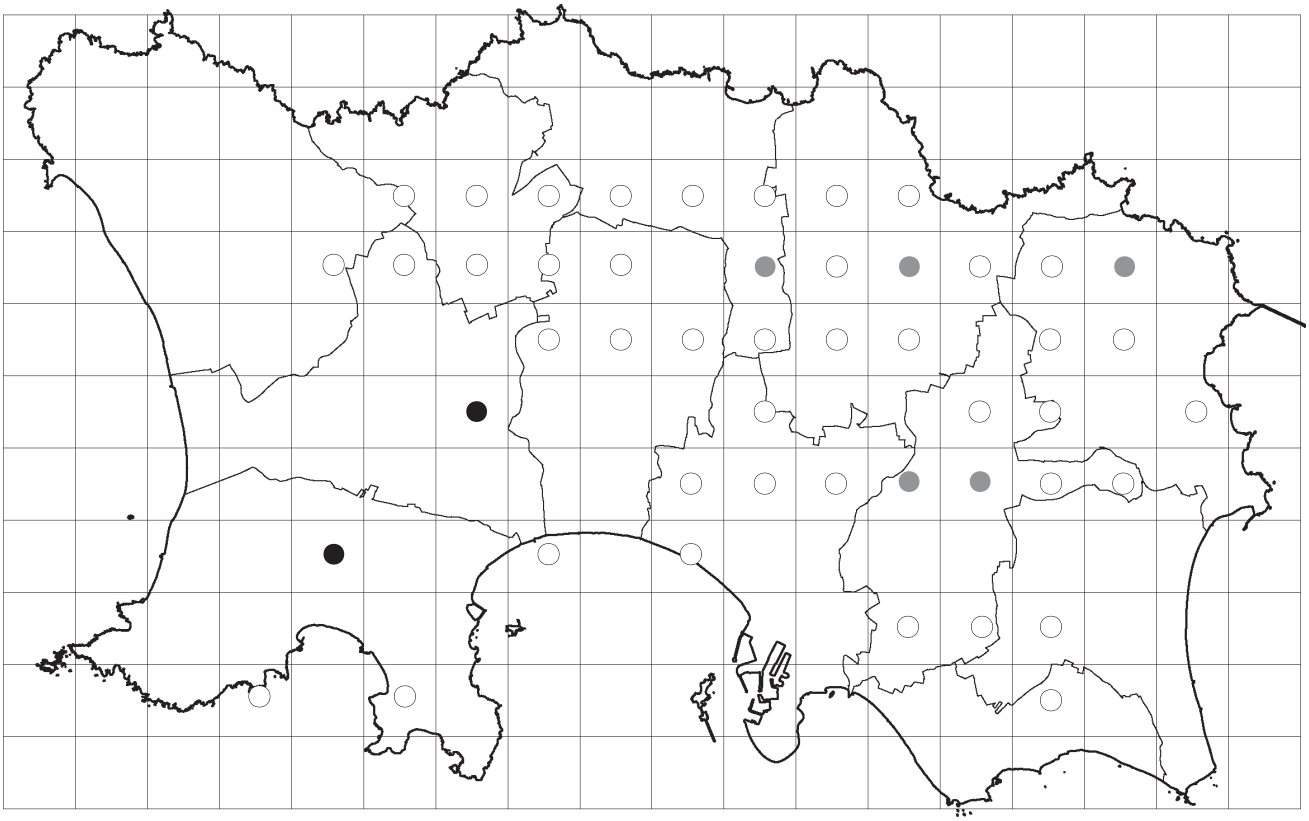


Photo Credit: Peter Double

Bio Diversity

Yellow Horned-poppy

(Glaucium flavum)

Action Plan

States of Jersey

1. Current status

1.1 *Glaucium flavum* is a medium to tall greyish short-lived perennial with wavy-edged leaves that clasp the branching stem. It does not reproduce vegetatively; instead seed is produced in abundance which naturally germinates in great quantity. Individual plants live for approximately two to five years, flowering in their second year. The flowering season begins in May and colonies continue to flower until the beginning of October. Seeds are dispersed by wind for germination, and need only a small amount of sand, drift or other fine material as a substrate.

1.2 *G. flavum* is mainly found on calcareous sands, shingle beaches and cliffs where the soil is skeletal with a low to very low humus content, is well drained and has a typical pH range of between 7.5 - 8.4. It has a marked preference for recently disturbed ground and new plants will not establish on consolidated substrata. It is known to be able to tolerate being buried under a few centimetres of material and can survive slight damage by trampling.

1.3 *G. flavum* is distributed from southern Sweden and Norway across Europe to the shores of the Mediterranean extending from the Black Sea coast of Bulgaria to Turkey. It also occurs in Palestine, Transjordan, Syria and Lebanon. It is naturalised in New Zealand and in parts of North America.

1.4 In 1984 in Jersey, *G. flavum* was still present on the same beaches where it was recorded in 1839, but was decreasing because of the pressure from holidaymakers. It was present then in at least 9 1.15 km squares in the Island. In 1998 there were still at least 8 small populations of *G. flavum* in Jersey occurring in 5 1-km squares, but they are extremely localised.

1.5 *G. flavum* is mainly located on loose substrates that have been recently disturbed mostly along the top of the sea walls at St Ouen's Bay and L'Ouaisné but also on the shingle of one beach where it does very well.

1.6 *G. flavum* is listed in this report as having 'declined' in Jersey. Its present status is 'locally 'rare'. It is a 'locally distinct' species.

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Damage to sites where *G. flavum* is found.

3. Current action

3.1 Recent research has been published on the restoration of coastal shingle vegetation, including the use of *G. flavum* for this purpose.

4. Action plan objectives and targets

4.1 Establish an ex-situ programme to maintain the genetic diversity of *G. flavum* in Jersey by 2007.

4.2 Introduce a monitoring programme to monitor the status of all populations by 2007.

4.3 Maintain and enhance all extant populations by 2009.

4.4 Increase the size of the populations at selected sites.

4.5 Introduce *G. flavum* to one shingle site by 2011.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 No action proposed

5.2 Site Safeguard and Management

5.2.1 Monitor the extent to which *Carpobrotus edulis* is extending into the population of *G. flavum* at the beach below the desalination plant at La Rosiére by 2006 (Action: ED). It should be removed if it begins to significantly affect the population there.

5.2.2 Undertake site assessments at Le Braye and La Pulente by 2006 (Action: Countryside Manager). Determine whether management work can be undertaken to encourage the species. Key considerations are:

5.2.3 That the substrates should be loose and should not be becoming consolidated and therefore preventing seeds from germinating.

5.2.4 That there is sufficient disturbance at the sites so that, as above, the substrate remains loose and so that other plants have difficulty colonising, so maintaining competition at a low level.

5.2.5 That the sites are not becoming overgrown with other vegetation that will compete strongly with *G. flavum* .

5.2.6 At least these three factors must be satisfied for the populations at these two sites to expand. Undertake the necessary management work with the aim of increasing the populations at these sites to at least 50 individuals by 2011. Consider fencing off site

at Le Braye as it is likely a great deal of trampling from visitors occurs on these rocks. If these populations are lost before management work is undertaken, disturbance should still be provided to reactivate the seed bank.

5.2.7 Increase the populations at sites at St Ouen Bay and L'Ouaisné to at least 50 individuals by 2010. (Action: ED - CMT)

5.2.8 Undertake management at other sites to maintain and enhance the populations there by 2009. (Action: ED - CMT)

5.3 Species Protection and Management

5.3.1 Collect seeds and deposit them at the Millennium Seed Bank at Wakehurst Place by 2007. (Action: ED)

5.3.2 Introduce *G. flavum* to one shingle site by 2011. Use local seed or seedlings, (from Jersey) to found the new population. (Action: ED)

5.4 Advisory

5.4.1 No action proposed.

5.5 Future Research and Monitoring

5.5.1 Conduct research to determine whether trampling of the populations by visitors to sites is taking place by 2010 (Action: ED). If so determine the level of trampling and fence off those sites suffering from significant levels. (Action: ED - CMT)

5.5.2 Introduce a monitoring programme to monitor the status of all populations by 2007. (Action: ED)

5.6 Communications and Publicity

5.6.1 Use *G. flavum* to educate visitors about coastal ecosystem conservation in Jersey. This should be done through the existing literature freely available to tourists by 2012. (Action: ED)

5.7 Links with other Action Plans

5.7.1 There are no direct links with other action plans.

Yellow Horned-poppy *Glaucium flavum*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Yellow Horned-poppy in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

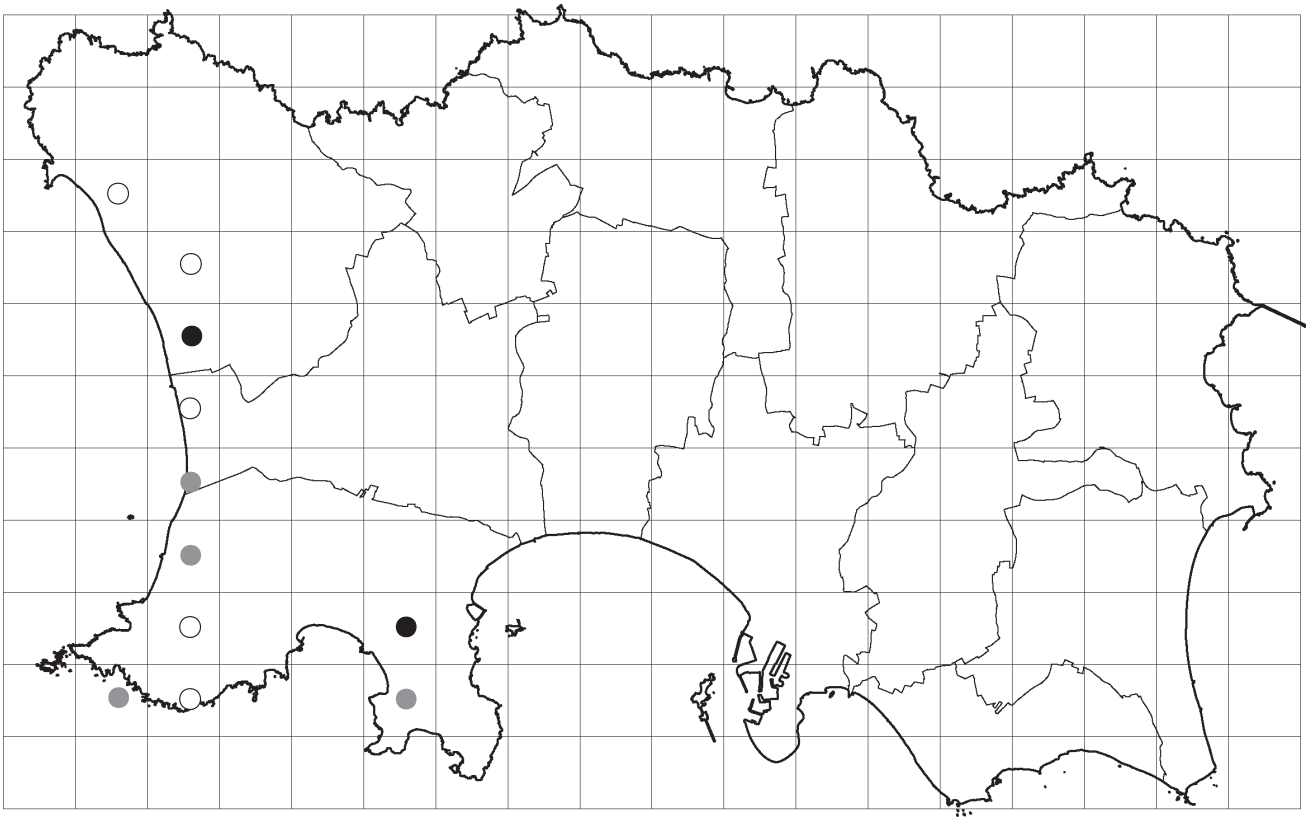


Photo Credit: Roger Long

Bio Diversity

Six-stamened Waterwort

(Elatine hexandra)

Action Plan

States of Jersey

1. Current status

1.1 *Elatine hexandra* is an annual or short-lived perennial with a low creeping growth form. An aquatic plant that often behaves as an empheral on exposed wet mud, it has tiny pinkish flowers, with six stamens, which are borne between July and September. The minute seeds are dispersed passively, the chief agents of dispersal being rain-wash and flood-water and occasionally birds. Reproduction is mainly by seed. Plants can persist in the vegetative state whilst submerged beneath the water at depths of one metre or more but will only flower in shallow water or on bare mud. It does best on seasonally exposed mud where the species can dominate substantial areas.

1.2 *E. hexandra* tolerates a wide range of substrates and nutrient conditions, but has a preference for soft, sandy or peaty mud. It can also grow on almost pure sand or some types of fine gravel. At the other extreme it can occur in moderately nutrient-rich water, and is able even to exist at the edges of highly turbid eutrophic water bodies. It is not tolerant of hard water or of competition from other species.

1.3 *E. hexandra* is widely distributed in Europe and beyond, reaching northwards to southern Scandinavia and southwards to north and west Africa.

1.4 In 1903 *E. hexandra* was recorded from three sites in Jersey. The species was known from one site in 1984 where it had persisted since 1961. *E. hexandra* was still there in 2005.

1.5 *E. hexandra* is known from one site in Jersey, where it occurs on the bare mud or in the shallows of La Hague Reservoir during the summer months. The species has always been rare in Jersey.

1.6 *E. hexandra* is recorded as a 'Nationally Scarce' species in Britain. In Jersey it is recorded as 'rare'.

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Loss of interconnectivity between wetland sites has reduced the dispersal potential of the species.

3. Current action

3.1 No conservation action or monitoring of the species is presently being undertaken in Jersey.

4. Action plan objectives and targets

4.1 Introduce a monitoring programme by 2006 (Action: ED).

4.2 Establish an ex-situ programme to maintain the genetic diversity of *E. hexandra* in Jersey by 2007.

4.3 Maintain and enhance the extant population at La Hague Reservoir, by 2009. (Action: ED)

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed

5.2 Site Safeguard and Management

5.2.1 Negotiate a site management agreement with the Jersey Water to ensure that La Hague Reservoir is managed in a way that is beneficial to the conservation of *E. hexandra*, by 2009 (Action: ED). A key part of this agreement should be to ensure that water levels are allowed to fall each summer exposing a sufficient area of bare mud to allow at least double the present population of *E. hexandra* to germinate. Other key points within the agreement should be that the margins of the reservoir are not allowed to become overgrown, the competition from other species is minimised and the pH of the mud is not artificially altered to exclude *E. hexandra*. Aim to double the population of *E. hexandra* at this site by 2013.

5.3 Species Protection and Management

5.3.1 Collect seeds from *E. hexandra* and deposit them at the Millennium Seed Bank at Wakehurst Place by 2007. (Action: ED)

5.3.2 Reduce competing vegetation from around the edge of the reservoir . The seed bank should then be reactivated by disturbing the mud. Contact PLANTLIFE for further advice on reactivating the seed bank. If this work fails, reintroduce *E. hexandra* to a former site. Use local seed or seedlings from Jersey to found the new population by 2010. (Action: ED)

5.4 Advisory

5.4.1 Contact the Jersey New Waterworks Company to advise them of the presence of the species on their land, by 2007 (plus, see section 5.2.1). (Action: ED)

5.5 Future Research and Monitoring

5.5.1 Monitor the population annually. Use this data to refine conservation management techniques employed at the site. (Action: ED)

5.5.2 Monitor the spread of *Crassula helmsii* at La Hague reservoir. (Action: ED)

5.6 Communications and Publicity

5.6.1 None proposed

5.7 Links with other Action Plans

5.7.1 The implementation of this Action Plan could benefit the BAP species *Cyperus fuscus* and *Baldellia ranunculoides*. Although none of these species is known to grow in association at present, it is possible that they could do so and management at one site would benefit the other species if they arrived there naturally or were introduced.

Six-stamened Waterwort *Elatine hexandra*

● records 1984 - 1998

Distribution of Six-stamened Waterwort in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

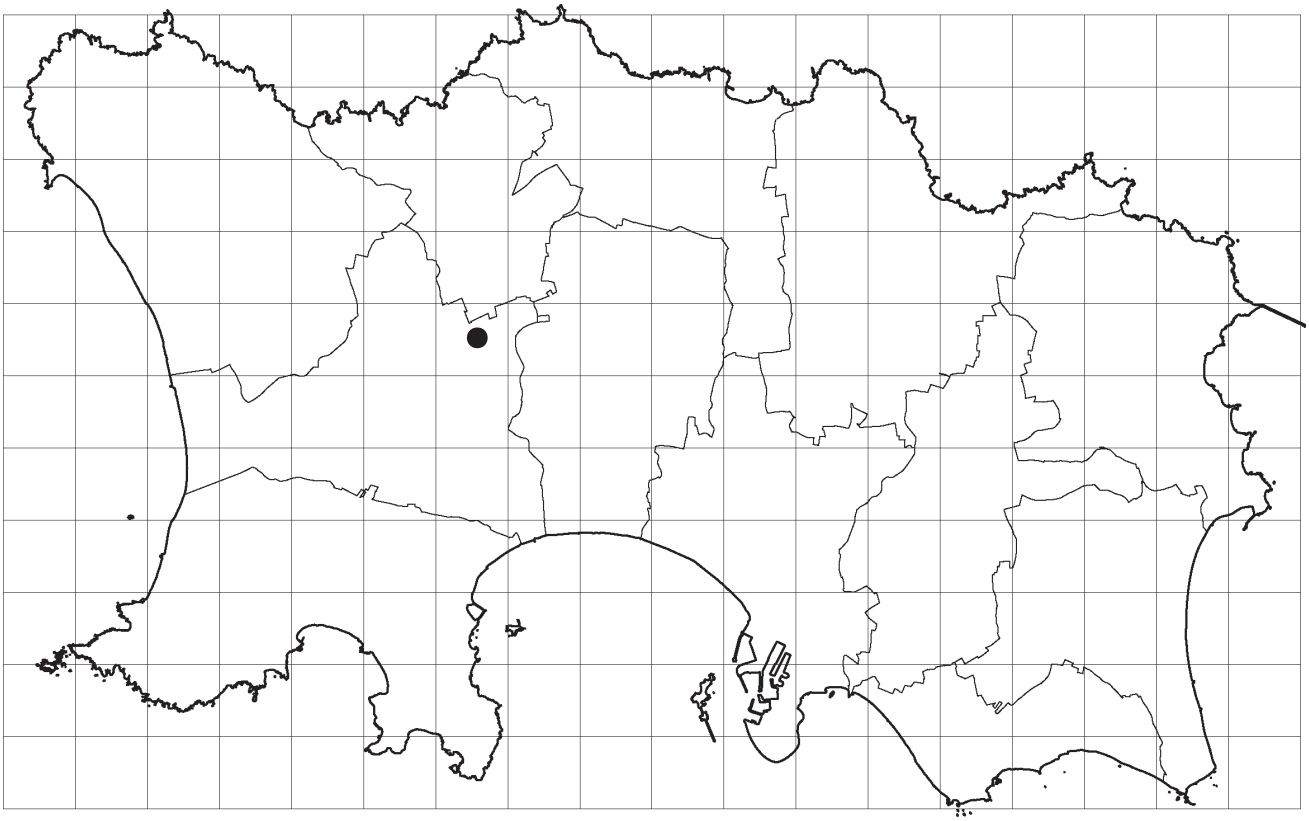


Photo Credit: Roger Long

Bio Diversity

Lesser Water-plantain

(Baldellia ranunculoides)

Action Plan

States of Jersey

1. Current status

1.1 *Baldellia ranunculoides* is a creeping perennial with narrow lanceolate leaves that typically grows to approximately 20 cm in height. From the base of the leaves white or pale pink flowers, with six stamens, in bloom between June and September. Lesser Water-plantain is relatively intolerant of shade and competition from other species but it is able to tolerate water nutrient loads ranging from mesotrophic to eutrophic.

1.2 *B. ranunculoides* is found in the shallow water of ditches and fen ditches, at the margins of streams, ponds, and often in and by peaty fresh water. It has a strong preference for calcareous peaty soils.

1.3 Lesser Water-plantain was known during the 19th century in Jersey but recent records date from the 1920s and 1930s when it was found at St Ouen's Pond. Its seed probably lay dormant until it was disturbed in 1991 and reappeared at Le Canné du Squez, Les Landes. In 1997 *B. ranunculoides* continued to exist at this single site, although it could not be found in 1998 due to unsuitable habitat conditions.

1.4 Lesser Water-plantain is distributed in Europe from southern Norway to Lithuania and western Greece and globally, reaches as far south as north Africa.

1.5 *B. ranunculoides* is found on the bare mud and in the shallow water around the pond at Le Canné du Squez, St Ouen.

1.6 Lesser Water-plantain is listed as a 'Notable additional species' in Britain. It is listed as 'rare' in Jersey in this report.

1.7 It is also now to be found at L'Ouaisné.

2. Current factors causing loss or decline

2.1 Loss of sites.

2.2 Degradation of sites resulting in the habitat no longer being suitable for the species.

3. Current action

3.1 Great Fen-sedge, *Cladium mariscus*, is removed annually in May from Le Canné du Squez.

3.2 Le Canné du Squez is protected within the Les Landes Ecological SSI.

4. Action plan objectives and targets

4.1 Introduce a monitoring programme, by 2006.

4.2 Maintain and enhance the extant population at Le Canné du Squez, by 2007.

4.3 Establish an ex-situ programme to maintain the population of *B. ranunculoides* in Jersey, by 2007.

4.4 Restore *B. ranunculoides* to St Ouen's Pond, by re-activation of the seed bank, if appropriate, by 2013.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 Continue to safeguard the SSI status of the area.

5.2 Site Safeguard and Management

5.2.1 Continue to remove Great Fen-sedge from Le Canné du Squez by 2006. (Action: ED - CMT)

5.2.2 Remove selected stools of *Molinia* from the pond at Le Canné du Squez, by 2007. (Action: ED - CMT)

5.2.3 Ensure that the bare mud habitat is maintained at this site by 2007. Perennial vegetation colonising the mud to be removed. A small amount of disturbance to some of the mud to be provided annually e.g. trampling by one worker. (Action: ED - CMT)

5.3 Species Protection and Management

5.3.1 Cultivate seedlings of *B. ranunculoides* by 2007. (Action: ED)

5.3.2 Restore *B. ranunculoides* to its last known site at St Ouen's Pond by 2013. This should be done if possible by reactivating the seed bank. If all reactivation work fails, the species should be reintroduced to St Ouen's Pond using local plant material . The site of the restored population should be managed for the conservation of *B. ranunculoides* as described in point 5.23. (Action: ED)

5.4 Advisory

5.4.1 None proposed

5.5 Future Research and Monitoring

5.5.1 Initiate a monitoring programme for the species by 2006. (Action: ED)

5.6 Communications and Publicity

5.6.1 Publicise the successful restoration/re-introduction of *B. ranunculoides* to a new site. Show how the work of the ED and CMT has brought a species back from the verge of extinction in the Island of Jersey.

5.7 Links with other Action Plans

5.7.1 The implementation of this Action Plan could benefit the BAP species *Cyperus fuscus* and *Elatine hexandra*. Management for one of these species would benefit the others should they occur together. This Action Plan is also linked to the Species BAP for *Hypericum elodes*, a species that also occurs at Le Canné du Squez.

Lesser Water-plantain *Baldellia ranunculoides*

● records 1984 - 1998

Distribution of Lesser Water-plantain in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey', Baxter, 1998.

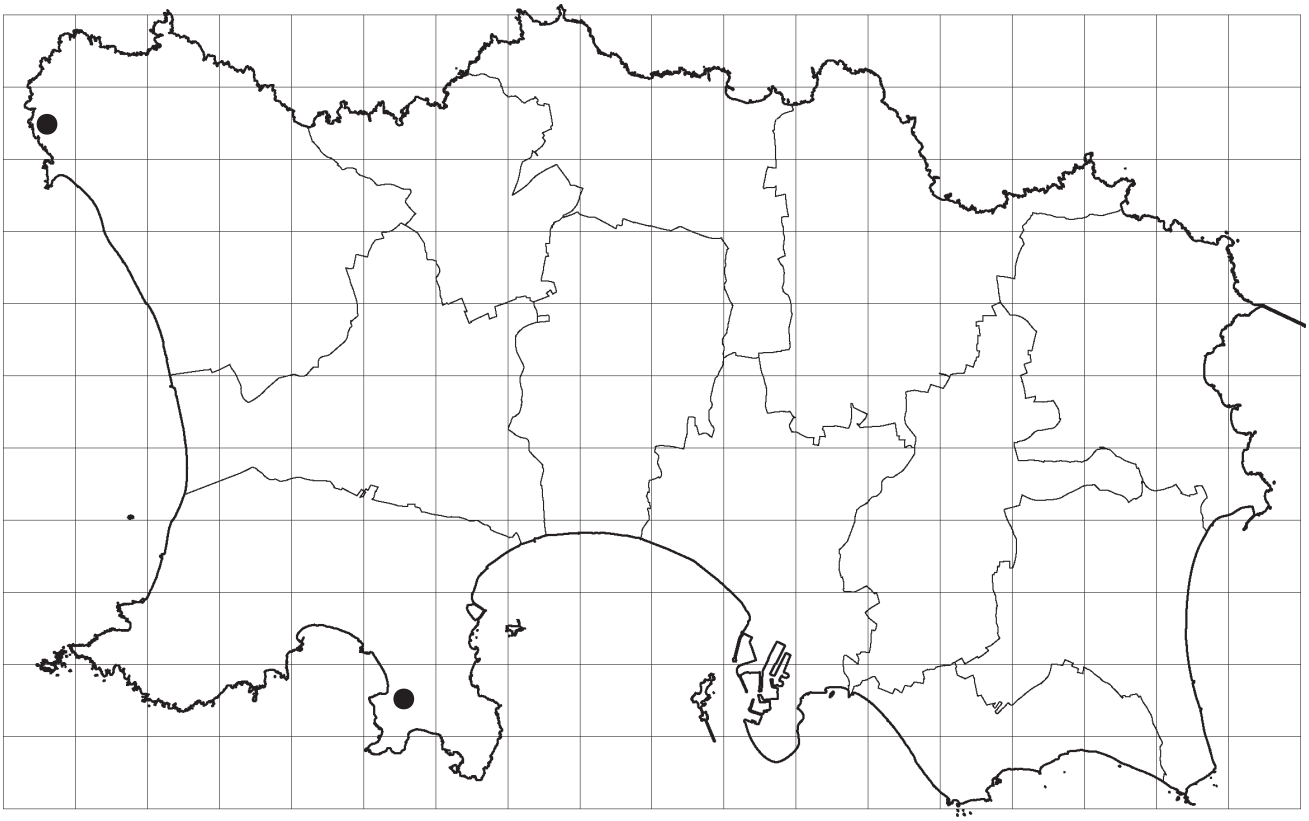


Photo Credit: John Pinel

Bio Diversity

Jersey Fern

(Anogramma leptophylla)

Action Plan

States of Jersey

1. Current status

1.1 *Anogramma leptophylla* is a mainly annual fern that in Jersey grows between October/November and May/June. It is not tolerant of high levels of inter-specific competition but is able to tolerate intense intra-specific competition. In Jersey it appears to be more abundant following hot summers and mild winters.

1.2 *A. leptophylla* favours acidic soils, of pH 6 or lower, typically around pH 5 but will grow on a wide range of substrates. It prefers sites where disturbance occurs, normally in the form of surface erosion. It is tolerant of shade and will grow on slopes of any aspect although it has a preference for south facing sites. In Jersey *A. leptophylla* is almost always found growing in association with the liverwort *Lunularia cruciata*. It is distributed from Guernsey in the north of its range through Europe to the Mediterranean and across the globe to Africa, Asia and as far south as South America, New Zealand and Australia in the southern hemisphere, but is not found in Britain.

1.3 In 1984 *A. leptophylla* was known from nine 1.15 km squares in the Island but has declined slightly since then. In 1998 seven or possibly eight sites are known which are located in 6-7 1-km squares. It has been observed to range from 'locally abundant' in some years to 'rare' in other years.

1.4 *A. leptophylla* occurs on cemented walls, dry stone walls and on rocky banks in Jersey. Many sites are steep with a sandy substrate that is very dry in summer but suffers from a degree of soil erosion. None of the sites is north facing.

1.5 This report lists *A. leptophylla* as 'scarce' in Jersey. It is a 'locally distinct' species.

2. Current factors causing loss or decline

2.1 Harsh branchage of many sites causing further erosion that destroys the individuals of *A. leptophylla*.

2.2 Non-removal of dead plant material following the branchage.

2.3 Continual clearing of plants from walls or the repointing of stone walls.

2.4 Banks and walls becoming overgrown with vegetation.

3. Current action

3.1 There is no conservation action presently being undertaken for *A. leptophylla* in Jersey.

4. Action plan objectives and targets

4.1 Monitor all extant populations of *A. leptophylla* by 2006.

4.2 Ensure that good branchage practice is observed at all extant sites by 2007.

4.3 Ensure that 'wall' sites are managed for the conservation of the species by 2008.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed

5.2 Site Safeguard and Management

5.2.1 Introduce voluntary site management agreements to ensure that extant sites for *A. leptophylla* are managed for its conservation by 2007. (Action: ED)

5.2.2 Ensure extant sites are branchaged only lightly by 2007. The bank flora should not be completely removed and the soil of the bank should be left untouched by tractor-driven flails. If this proves impossible, branchage these banks by hand. (Action: ED)

5.2.3 Ensure dead plant material is removed from the banks around extant populations of *A. leptophylla* following the branchage by 2007. (Action: ED)

5.2.4 Ensure walls that are habitats for *A. leptophylla* do not become overgrown with other vegetation, by 2008. Vegetation should be removed by hand during the growing season for Jersey Fern, so that damage to individuals of the species can be avoided. Complete removal of all vegetation is neither required nor desirable. Only sufficient should be removed to minimise competition with *A. leptophylla*. (Action: ED)

5.2.5 Ensure that walls where populations exist are not stripped of their vegetation or repointed, by 2008. If walls require cleaning this should be carried out using the recommendations made in point 5.2.4. Repointing should be avoided, unless it is essential for the structural stability of the wall. (Action: ED)

5.3 Species Protection and Management

5.3.1 If the species declines from 'scarce' to 'rare' an ex-situ programme should be initiated.

5.4 Advisory

5.4.1 Inform landowners with extant populations of *A. leptophylla* of the presence of the species and of the action they should take by 2007. (Action: ED)

5.5 Future Research and Monitoring

5.5.1 Monitor all extant populations of *A. leptophylla* annually in early May by 2006. (Action: ED)

5.6 Communications and Publicity

5.6.1 Produce a set of written guidelines of how to manage sites for *A. leptophylla* based on the points made above by 2007. Distribute to landowners with list of extant sites for Jersey Fern. Emphasise the importance of its conservation within the context of the Island Biodiversity Strategy. (Action: ED)

5.7 Links with other Action Plans

5.7.1 Island-wide improvements in branchage practice called for in the Species BAPs for *Linaria vulgaris* and *Fragaria vesca* are likely to benefit *A. leptophylla*.

Jersey Fern *Anogramma leptophylla*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Jersey Fern in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Biodiversity Action Plans for Eleven Species of Threatened Plants in Jersey' Baxter, 1998.

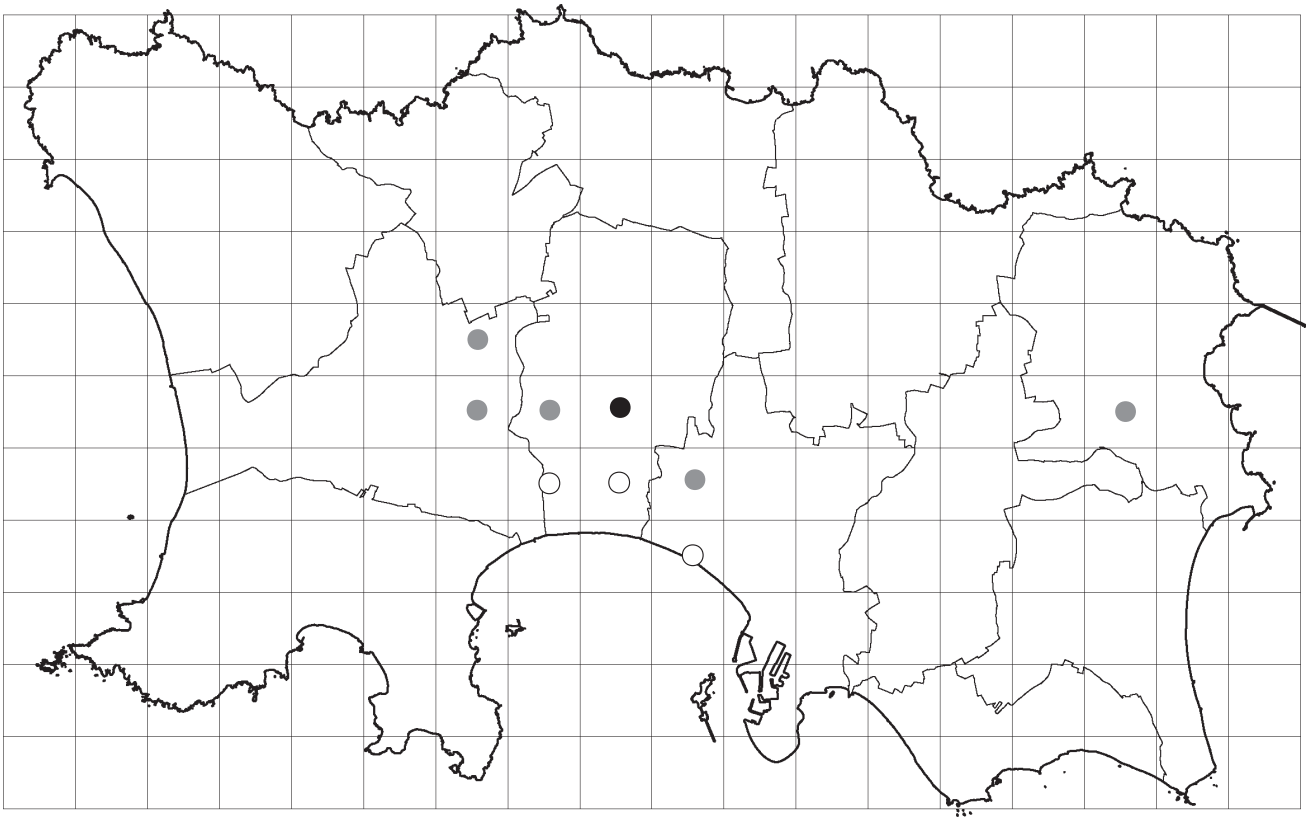


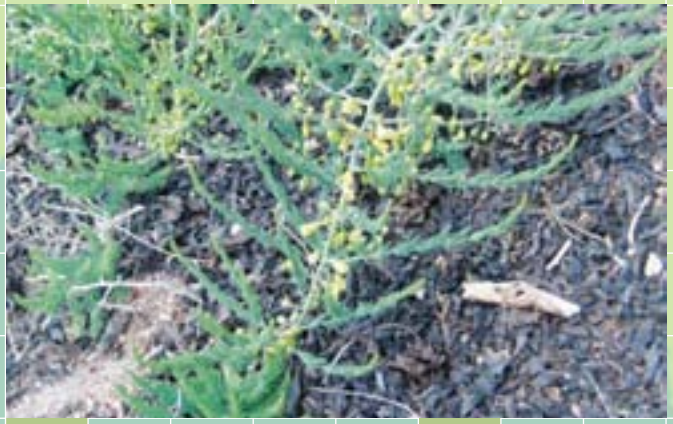
Photo Credit: Roger Long

Bio Diversity

Wild Asparagus

(Asparagus officinalis prostratus)

Action Plan



States of Jersey

1. Current status

1.1 In 1997 *Asparagus officinalis* subspecies *prostratus* was known from only one site in Jersey, on the cliffs below La Moye (see site description, below). The subspecies was formerly also known from St Ouen's Bay with a single plant present south of Le Braye as recently as 1996. Despite searching no plants were found here in 1997. It is unclear as to the former extent of the St Ouen's Bay colony although Le Sueur (1984) stated that unfortunately, by 1983, all the St Ouen plants appeared to be male.

1.2 The subspecies has been known on the cliffs between Beauport and La Corbière since 1839 (Le Sueur, 1984). The size and number of colonies along this stretch of coast in the past is unknown although in 1979 there were 'many' plants found from Beauport - La Corbière (Le Sueur, personal records) and it is thought these were in several distinct areas (Banks, pers. comm.).

1.3 The site is privately owned and falls just outside the boundary of La Landes du Ouest Site of Special Interest (SSI). Public access is not advertised and the path is only used by a small number of people.

2. Current factors causing loss or decline

2.1 Hottentot Fig *Carpobrotus* sp. an introduction from South Africa, is now well established on south-western cliffs. Where it grows it has 'smothered and so killed large areas of natural vegetation' (Le Sueur, 1984). Whether it actually kills mature Asparagus plants is unclear as there are no data on the previous location of plants at La Moye but it almost certainly prevents any recruitment to the population. Additionally, Percival (Howard, pers. comm.) found invertebrates completely absent within an area of *Carpobrotus* in Cornwall where in an adjacent area of natural vegetation invertebrate numbers were high.

2.2 Even in the last few years, *A. officinalis prostratus* has been collected for food in Jersey (Long, pers. comm.). This may have been an important factor in the decline of the St Ouen's Bay population, although it is less likely at the relatively undisturbed La Moye.

2.3 A study of Welsh populations (Kay & John, 1995) showed high levels of heterozygosity and fairly high polymorphism, suggesting a high level of true heterozygosity in Asparagus plants. Therefore genetic erosion is likely. Indeed, plants at Welsh sites showed considerably fewer alleles at the loci than plants from (larger) Cornish populations. Similar effects are likely in the small Jersey population. Additionally, in a small population the number of female plants is likely to be low and cross-pollination of flowers less likely leading to reduced chances of reproduction.

3. Current action

3.1 *A. officinalis prostratus* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

4. Action plan objectives and targets

4.1 To establish and maintain a viable population of this species at its one known site.

4.2 To determine, by 2006, the current status of this species in areas where it was formerly known.

5. Proposed actions with lead agencies

5.1 Site safeguard and management

5.1.1 Inform landowner of the site of all *A. officinalis prostratus* plants. (Action: ED)

5.1.2 Keep disturbance to a minimum by allowing the cliffpath along which *A. officinalis prostratus* grows to remain 'unadvertised'. (Action: ED)

5.1.3 Gradually remove *Carpobrotus* from the area around the Asparagus plants.

5.1.4 Roots and rhizomes of *A. officinalis prostratus* are entangled within the mat of *Carpobrotus* roots and litter. Large scale removal of *Carpobrotus* would leave the ground bare and liable to erosion.

5.3 Species management and protection

5.3.1 Carry out artificial pollination of any female flowers during the next flowering season in order to increase seed production. In a Welsh population, 20 out of 25 female flowers pollinated in this way produced fruit (Rich, pers. comm.). This process should be carried out at La Moye for the next three years and success monitored. If successful it can be continued beyond this date. (Action: ED - Countryside Manager)

5.3.2 Collect seed when sufficient is available from the La Moye plants to be sent to the RBG seedbank at Wakehurst Place. (Action: ED - Countryside Manager, Société Jersiaise)

5.4 Advisory

5.4.1 Inform the landowner of the presence of the plants. Draw up an agreement regarding the management of the site. (Action: ED)

5.5 Future research and monitoring

5.5.1 Monitoring of the site to be carried out twice annually, once in the flowering season (late May - June) and once when the fruit is ripe (late August - September). Each plant's location, sex, number of flowers/fruits and vigour should be noted. (Action: ED - Countryside Manager, Société Jersiaise)

5.5.2 Make an extensive search of suitable habitat for the subspecies on the cliffs between Beauport and La Corbière where the subspecies was formerly known. (Action: ED - Countryside Manager)

5.5.3 Continue to monitor for the subspecies' occurrence at its former St Ouen's Bay site. (Action: ED - Société Jersiaise, Countryside Manager)

5.6 Communications and publicity

5.6.1 Maintain contact with key individuals responsible for the subspecies' conservation in the UK, for reference, improving information flow and to consider the possibility of joint initiatives.

5.6.2 Consider using the subspecies to illustrate the threat posed to Jersey's natural vegetation by Hottentot Fig through publicity in local news media. (Action: ED)

5.6.3 Update Plantlife on the status of *A. officinalis prostratus* in Jersey, annually. (Action: ED)

5.7 Links with other Action Plans

5.7.1 None proposed.

Wild Asparagus *Asparagus officinalis* subspecies *prostratus*

● records 1984 - 1998

Distribution of Wild Asparagus in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

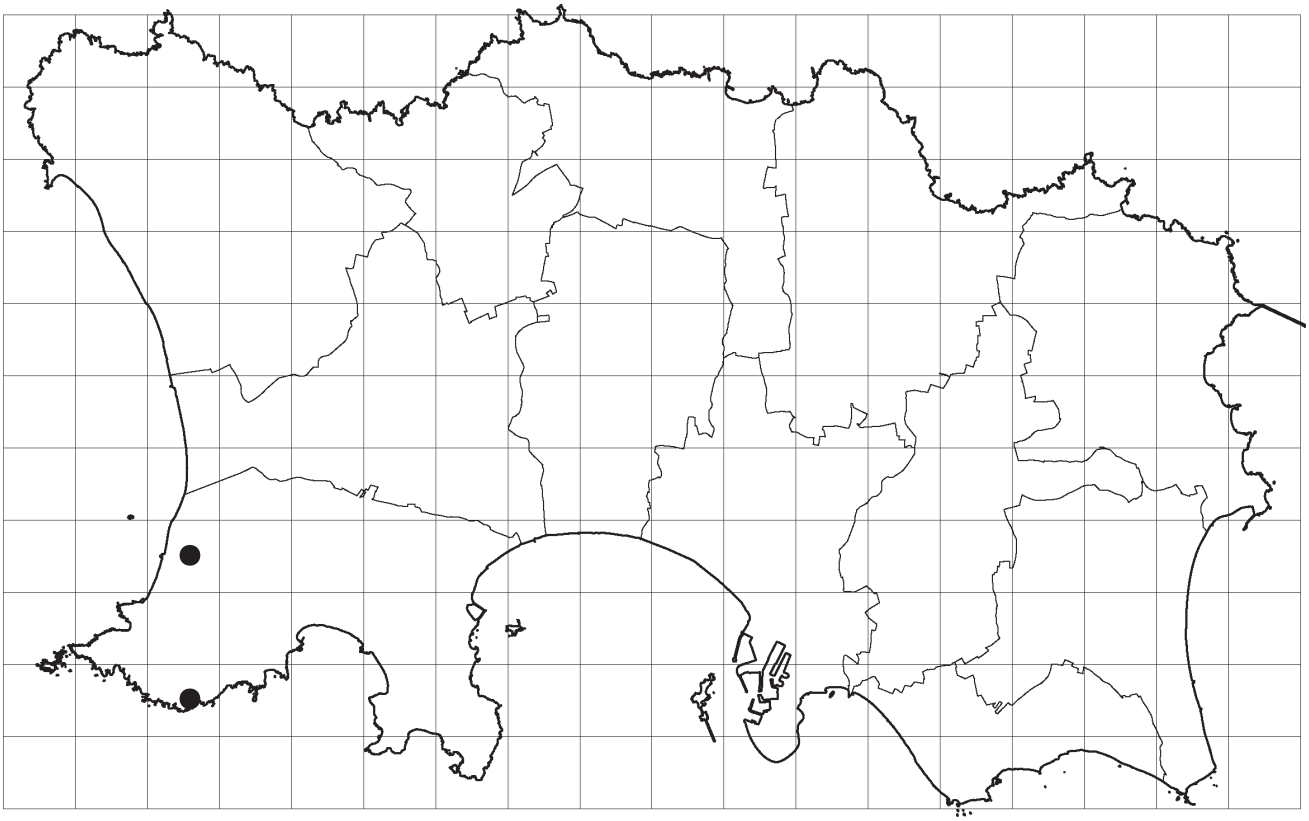


Photo Credit: John Pinel

Bio Diversity
Jersey Pink
(Dianthus gallicus)
Action Plan

States of Jersey

1. Current status

1.1 Whether *Dianthus gallicus* is native to Jersey is a matter of debate. Clement and Foster (1994) state that the species is 'a garden escape, or perhaps introduced, naturalised since 1892 in the sand dunes at St Ouen's Bay'. This statement is based mainly on the species not being discovered prior to 1892, in an area previously extensively searched by several botanists. However, the location of its discovery was a long way from the nearest house (Lester-Garland, 1903) and with its distribution on the continent similar to that of several other species considered native in Jersey (Le Sueur, 1984), it is impossible to be certain either way.

1.2 In the 1950s the sole location for the species, at Les Mielles, was destroyed by sand workings. Fortunately, prior to destruction, some turf was removed and relocated nearby, at the site where the species was still known in 2005.

1.3 *Dianthus gallicus* became extinct at Les Mielles in 1993 (Banks, pers. comm.). The plants present in 1997 descend from a reintroduction, in 1994, of plants propagated from cuttings taken from the last remaining wild individuals. The reintroduction took place during a long drought however and no plants were found in 1995 or 1996. It is unclear whether, during these two years, plants were present but were not found by botanists, or for some reason plants failed to produce shoots in the summer and were thus not apparent.

1.4 In 1997 two small patches of *Dianthus gallicus* were present, about 100 metres east of the pools at Les Mielle de Morville They are both within a small area enclosed by rabbit-proof fencing; the first patch, around 20x20cm in size, with 16 flowering stems present, is in a small hollow near the top of a small ridge; the second, around 50x50cm in size but less continuous, with 8 flowering stems present, is in the north-west corner of the enclosure in a flat area at the foot of the ridge. The two patches are approximately five metres apart.

1.5 Vegetation inside the enclosure is very much taller than the closely-grazed sward on the top of the ridge outside, with large patches of *Centaurea aspera* dominant. On the slope of the ridge, vegetation is dominated by *Ammophila arenaria* and *Pteridium aqulinum*, these species similarly dominant outside the enclosure. Over the enclosure as a whole the habitat is thus somewhat different to the short turf noted by Le Sueur (1984).

2. Current factors causing loss or decline

2.1 Despite the successful establishment of *Dianthus gallicus*, following its reintroduction in 1994, it is likely that the factors that led to its decline in the first place remain. Thus, the potential for successful recovery in the long term is limited. Presumably, the microhabitat or other external factors present at the current site are slightly different to those at the site from which it was transplanted in the1950s. The exact reasons for the species' decline at the current site are however, unclear. In the long-term more research is needed into the species' ecological requirements (see 4.6.3). However, in the short term, the following two factors may influence the chances of recovery.

2.2 With an absence of rabbit grazing in the enclosure the sward is much taller and denser than that outside. Large clumps of *Centaurea aspera* and *Raphanus maritimus* are also present. It is unlikely that *Dianthus gallicus* will be able to spread in these conditions, it being a plant of short turf (Le Sueur, 1984).

2.3 *Dianthus gallicus* is thought to be liable to damage from rabbit grazing in Jersey (Banks, pers. comm.). Therefore, if left unprotected by fencing, the species' recovery potential would be diminished as there is a large rabbit population at Les Mielles.

3. Current action

3.1 *Dianthus gallicus* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

3.2 The current site is within a 12x8m rabbit-proof enclosure, affording protection to the plants from grazing.

3.3 The area of Les Mielles within which the site is found is owned by the States of Jersey.

4. Action plan objectives and targets

4.1 To establish and maintain a viable population of this species at its one known site.

4.2 To gain a better understanding of the species' ecological requirements by 2010.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 *Dianthus gallicus* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

5.2 Site safeguard and management

5.2.1 Control vegetation growth within the enclosure at Les Mielles by cutting back potentially dominant species such as *Centaurea aspera* and *Raphanus maritimus*. All cut material should be removed to prevent nutrient build-up. With the exclusion of natural grazers, the natural process of succession will eventually lead to the loss of suitable habitat for *Dianthus gallicus* within the enclosure if management is not carried out. (Action: ED - CMT)

5.2.2 Adjust management accordingly if research into the species' ecology indicates that conditions are unsuitable at the current site. (Action: ED - CMT)

5.3 Species management and protection

5.3.1 Ensure a stock of genetic material from Jersey plants of *Dianthus gallicus* is retained by the States of Jersey. Sufficient quantity must be held for plants to be propagated should it become necessary to make further reintroductions. (Action: ED)

5.3.2 Reintroduce the species to carefully selected sites at Les Mielles. (Action: ED)

5.4 Advisory

5.4.1 None proposed.

5.5 Further research and monitoring

5.5.1 Encourage research into the species' autecology. Establishment of the ecological requirements of the species, using data from continental populations, is essential for the conservation of the species in Jersey. (Action: ED)

5.5.2 Monitor the size of the current population annually, during the flowering period, in order to detect responses to management of the enclosure. (Action: Countryside Manager)

5.6 Communications and publicity

5.6.1 Establish contact with botanists in France and/or Spain who are working on the conservation of *Dianthus gallicus*. With the species listed as 'vulnerable' in both countries (WCMC, 1997, pers. comm.) there are likely to be conservation actions taking place. Contacts may also know of the existence of any published research on the species. (Action: ED)

5.6.2 Use the media to publicise the recovery programme for the species, once it has become successfully re-established in Jersey. (Action: ED)

5.7 Links with other Plans

5.7.1 None proposed.

Jersey Pink *Dianthus gallicus*

● records 1984 - 1998

Distribution of Jersey Pink in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

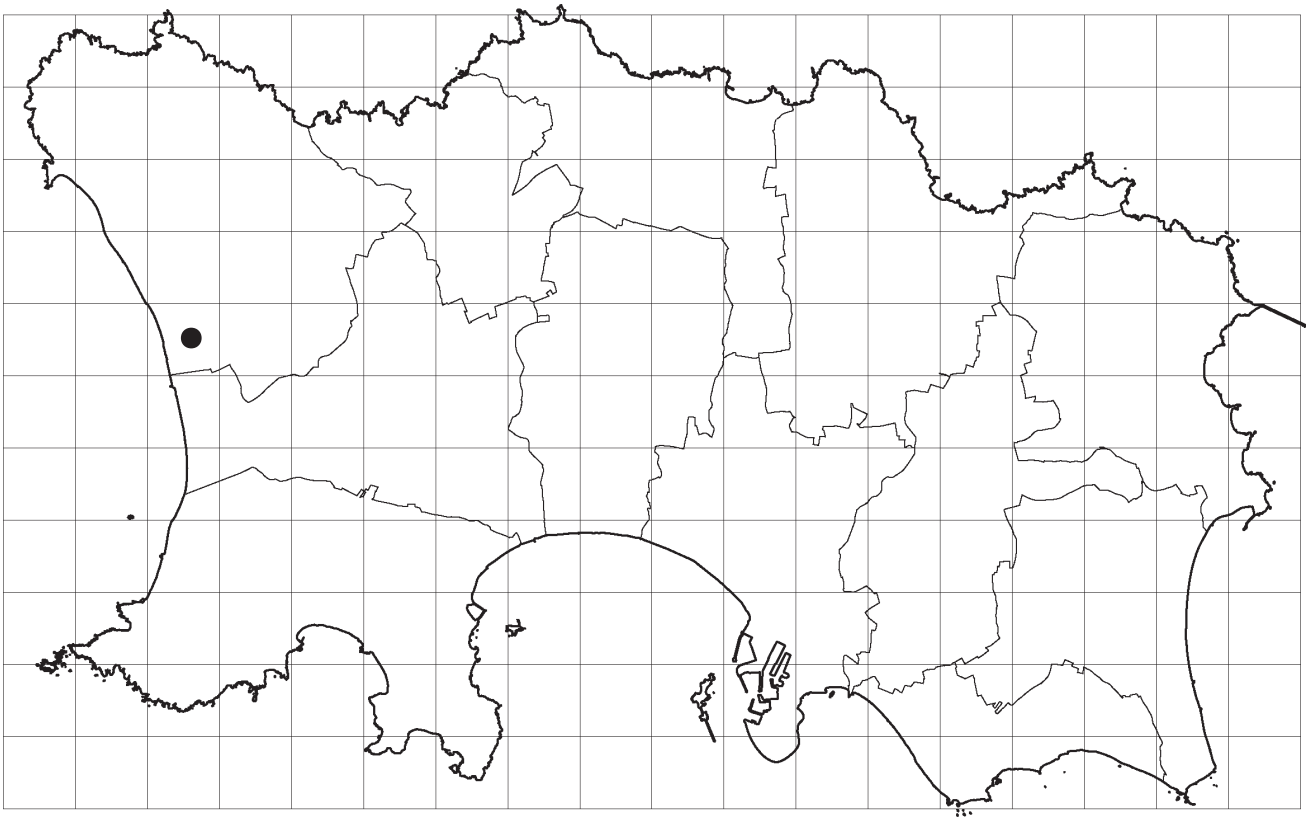


Photo Credit: Roger Long

Bio Diversity

Round-leaved Sundew

(Drosera rotundifolia)

Action Plan

States of Jersey

1. Current status

1.1 *Drosera rotundifolia* has always been rare in Jersey but was distinctly more widespread a century ago than it is now. Lester-Garland (1903) lists it from between La Moye and La Corbière, Bouley Bay, Bonne Nuit Bay and Giffard Bay. A few plants were still present above Giffard Bay in the 1960s (Le Sueur, personal records) but since then it has only been recorded from Égypte (see site description, below). A brief description is also given of the former site at Giffard Bay.

1.2 In 1997, *Drosera rotundifolia* could not be found at this site. However, due to the difficulties of searching such an impenetrable area, it is possible that a small number of plants may still exist. The species was still present in 1996 (Long, pers. comm.) although only in small numbers.

1.3 The site is at the foot of a steep, north-facing slope, approximately 200m north of Les Camps du Chemin. The area in which *Drosera rotundifolia* was present is marked, on site, by a series of stakes. The staked area, about ten metres across, is within an area of mire where, in July 1997, the water table was at or just below the surface throughout. The mire is fed by a freshwater spring further up the slope. The water is comparatively base-rich, despite flowing through Trinité soil with a fairly low pH (Anon, 1988).

1.4 Currently the staked area is dominated by large tussocks of *Molinia caerulea*, around which *Drosera rotundifolia* used to grow. These tussocks are surrounded by large quantities of surface-lying litter. *Rubus* sp. has invaded the area with *Angelica sylvestris* and *Juncus effusus* also frequent. Very little *Sphagnum* sp., a constant associate of *Drosera rotundifolia* in the UK (Crowder *et al.,* 1990), is present. Immediately surrounding the staked area, the vegetation is dominated by two metre high stands of *Eupatorium cannabinum*, with *Urtica dioica, Pteridium aquilinum* and *Rubus* sp. all also frequent. A small number of Sycamore *Acer pseudoplatanus* seedlings have also become established and the surrounding area has been colonised by Willows *Salix* sp.

1.5 In previous years, the area of *Molinia caerulea* was much larger, 30x30m in 1992 (Baker, 1992), and apparently even larger than this in the early 1980s (Anon, 1988). *Eriophorum angustifolium*, a frequent associate of *Drosera rotundifolia* (Crowder *et al.,* 1990), was also common at the site in the early 1980s, it is very rare or absent in 1997. Additionally, species such as *Eupatorium cannabinum* and *Rubus* sp., which are abundant now, were only noted as occasional in 1988 (Anon, 1988) and on the whole the site is now far more overgrown than it was in the past (Long, pers. comm.).

1.6 Égypte is also the only known site in the Channel Islands for the Large Chequered Skipper *Heteropterus morpheus*, although this butterfly may now reasonably be thought to be extinct as none have been seen here since 1996. Numbers were also very low in the years prior to these, for example, a maximum of nine in 1993 (Denny & Curry, 1993). In Jersey this species is dependent on *Molinia caerulea*, upon which its larvae feed (Baker, 1992).

1.7 *Drosera rotundifolia* was formerly present alongside a flush of freshwater running down a steep hillside into Giffard Bay (Long, pers. comm.). In 1997 a two metre wide strip either side of the flush was dominated by a two metre high stand of *Eupatorium cannabinum.*

1.8 *Molinia caerulea* is restricted to very small quantities alongside a footpath running parallel to the flush. In the 1960s suitable habitat for *Drosera rotundifolia* existed here and the state of the site now may provide a good indication, if left unmanaged, of how Égypte will be in 30 years time.

2. Current factors causing loss or decline

2.1 An increase in nutrient availability at the site, caused by eutrophication of its water supply would lead to invasion by competitive species and the consequent shading out of *Drosera rotundifolia*. The site has been invaded by tall, competitive species in the past few years and the species involved, *Urtica dioica*, for example, have a high requirement for mineral nutrients (Grime *et al.,* 1990), indicating that high levels of nutrients now exist. Previous work at Égypte has identified the soakaway drains of nearby houses as a potential source of nutrients. However, water samples taken from the site in 1994 and 1995 gave a figure for total coliforms of 736 per 100ml, a quite low figure for Jersey (Tangy, pers. comm.). Runoff, in the form of nitrates is thus suspected to be the main source of nutrient enrichment.

2.2 A reduction in the quantity of water present at the site could directly affect *Drosera rotundifolia* as it requires a high water table due to the shallowness of its rooting system.

2.3 *D. rotundifolia* could also be affected indirectly by the invasion of species such as *Acer pseudoplatanus* and *Salix* species following a drop in the water table. These would contribute to further drying out of the site as well as leading to shading out of the *Drosera rotundifolia* plants. Previous studies (Anon, 1988) have identified a threat to the water supply at Égypte from water abstraction by residents at nearby houses, none of which are served by mains supply. However, the water table in July 1997 was at or very close to the surface throughout the staked area, indicating that at present water quantity is still sufficient for the continued existence of *Drosera rotundifolia*.

2.4 Curtailment of previous management practices - Bracken *Pteridium aquilinum*, on the slope above the site, was cut for cattle bedding until the late 1960s (anon, 1988). *Molinia caerulea* also may have been removed in the past as its tussocks were used for making milking stools (Le Sueur, 1976). The cessation of Bracken cutting has been instrumental in the spread of the species at the site, which has led to the exclusion of species such as *Molinia caerulea* and to a build up of nutrients through litter deposition. Additionally, the build up of Molinia litter around the Molinia tussocks, which has destroyed some of the habitat for *Drosera rotundifolia*, may in part be due to lack of site management.

3. Current action

3.1 *Drosera rotundifolia* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

3.2 Some management work has been undertaken at the Égypte site in 1997; since then the site has had annual management.

3.3 The site is currently owned by the States of Jersey, on condition that it remains under conservation management (Freeman, pers. comm.). It is also a proposed SSI.

4. Action plan objectives and targets

4.1 To establish a viable population of *Drosera rotundifolia* at its one known site by 2008.

5. Proposed actions with lead agencies

5.1 Policy and legislation

5.1.1 None proposed.

5.2 Site safeguard and management

5.2.1 Active management is essential, especially whilst the underlying factors causing the species' decline are still in existence, in order to restore a viable population of *Drosera rotundifolia*.

5.2.2 *D. rotundifolia* has a known seed dormancy period of up to four years (Crowder *et al.*, 1990). Égypte is a very complex site and management to retain *Drosera rotundifolia* will only be successful if management is maintained.

5.3 Species management and protection

5.3.1 None proposed.

5.4 Advisory

5.4.1 None proposed.

5.5 Future research and monitoring

5.5.1 Arrange for water samples to be taken annually. (Action: ED)

5.5.2 Survey for the presence of *Drosera rotundifolia* annually, recording the number and location of plants. (Action: ED - Countryside Manager)

5.6 Communications and publicity

5.6.1 Publicity should be made of the programme to restore *Drosera rotundifolia* to the Égypte site, highlighting the damage to Jersey's native wildlife from agricultural runoff if tests confirm high levels of nitrates at the site. (Action: ED)

5.7 Links with other Plans

5.7.1 None proposed.

Round-leaved Sundew *Drosera rotundifolia*

○ records 1984 - 1998

Distribution of Round-leaved Sundew in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

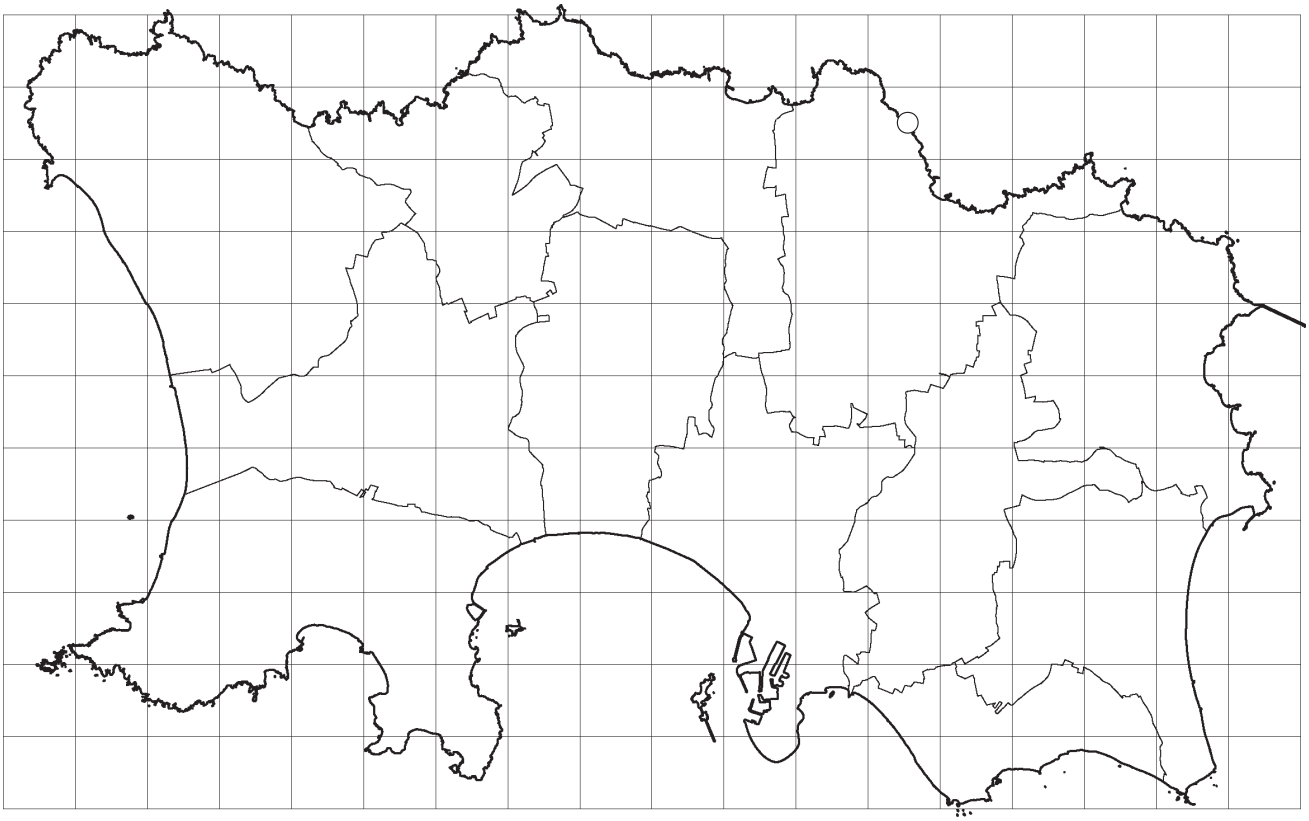


Photo Credit: Roger Long

Bio Diversity

Jersey Cudweed

(Gnaphalium luteoalbum)

Action Plan

States of Jersey

1. Current status

1.1 In 1997 *Gnaphalium luteoalbum* was found only at one site in Jersey, Les Mielles, St Ouen's Bay. Over the past 50 years the species has been found in most years in St Ouen's Bay where suitable habitat existed. For example, in 1955 it was plentiful in the sandpits north of St Ouen's Pond after an absence of some years (Le Sueur, 1984), in 1972, 22 plants were found in the fields east of St Ouen's Pond (Le Sueur, personal records) and in 1996 two plants were found on the golf course (Freeman, pers. comm.). It has also been found in recent years in La Mielle de Morville (Long, pers. comm.).

1.2 *G. luteoalbum* grows in a small, dried-up pond along the course of a stream running south-west through Les Mielles, some 200m south-east of the Frances Le Sueur Centre. The species has been known from this site since at least 1982 (Banks, pers. comm.), although it has not been seen in the past two or three years as the pond had become overgrown with *Phragmites australis*.

1.3 An area of approximately seven metres in diameter was cut and removed in May 1997 (Pinel, pers. comm.), in the hope that *G. luteoalbum* would return. On 30th July 1997, 180 plants were found, mostly around the edges of the cut area. The plants were mostly single-stemmed with a small cluster of unopened flowers at the top, indicating that they were still very young (Bichard & McClintock, 1975). Thus a later visit may have located more plants.

2. Current factors causing loss or decline

2.1 In 1689 when *G. luteoalbum* was first discovered in Jersey it was described as 'common' (Lester-Garland, 1903; Le Sueur, 1984). One possible explanation is that, at this time, naturally operating dune systems were present, not only at St Ouen's Bay, but along much of the south coast (Le Sueur, 1984). There would therefore have been plenty of suitable habitat in the form of dune slacks - the habitat of *G. luteoalbum* in England (Beckett, pers. comm.). The south coast dunes have since been lost to development and the St Ouen's Bay system stabilised by the construction of a seawall along the length of the bay. The species is therefore largely reliant on the artificial creation of suitable habitat, either inadvertently as a consequence of activities such as sand extraction or by direct conservation management. The failure to create suitable habitats is eventually likely to lead to the species extinction in Jersey.

2.2 At the single, currently known site, *Phragmites australis*, allowed to grow unchecked, led to the exclusion of *G. luteoalbum* over the past two or three years (Banks, pers. comm.). The ability of *Phragmites* to survive waterlogging, in addition to the fast accumulation of persistent stem litter frequently leads to it forming a monoculture (Grime *et al.*, 1990). Furthermore, *Phragmites* spreads vigorously by means of rhizomes and thus, unmanaged, would quickly lead to the loss of suitable habitat for *G. luteoalbum* at the site.

2.3 Although there is no direct evidence that the water table has fallen in this part of St Ouen's Bay, Cowlishaw *et al.*, (1993) noted that total groundwater take in Jersey is more than twice what is considered sustainable in the UK. This, combined with changes in rainfall patterns in relation to climate change, may lead to a fall in the water table. If this was to occur and winter flooding of sites became less frequent, *G. luteoalbum* might be excluded by more competitive species previously unable to colonise because of winter water logging.

3. Current action

3.1 *G. luteoalbum* is on the proposed list of species to be covered by the Conservation of Wildlife (Jersey) Law 2000.

3.2 The site is currently under the management of the Countryside Management Team.

3.3 The site is within an area of Les Mielles owned by the States of Jersey although there are no plans to designate the site as an SSI.

4. Action plan objectives and targets

4.1 To maintain a viable population of this species at its one known site.

4.2 To create suitable habitat for the species at a minimum of two sites by 2008.

4.3 To determine the status of the species across St Ouen's Bay as a whole by 2008.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site safeguard and management

5.2.1 Continue to manage the species' one known site. Phragmites should be cut annually during summer as this reduces its competitive advantage (Burgess *et al.*, 1995), preferably in late May or early June before *G. luteoalbum* seedlings appear. At present *G. luteoalbum* seems to prefer the Phragmites-fringed edges of the pond. Thus, a similar-sized area to that cut presently should be kept clear. If future monitoring reveals plants growing in more open

areas, a larger area of Phragmites can be cut each year. (Action: ED - CMT)

5.2.2 If winter water levels fall the pond could be dug out to lower it to the water table. (Action: ED - CMT)

5.2.3 Create potentially suitable habitat for *G. luteoalbum* by clearance of Phragmites on the east side of St Ouens Pond. Phragmites is due to be cut in the area of the 'Inner Pond', by the National Trust for Jersey, within the next year (Banks, pers. comm.). The National Trust ranger should be made aware of the management requirements of *G. luteoalbum* and these requirements taken into account during any management work at this site. (Action: ED, National Trust for Jersey)

5.3 Species management and protection

5.3.1 Discourage access to the site. At present there is no footpath access to the site and it is effectively screened by a bank of *Populus alba*. This situation should be maintained to prevent damage to the plants from trampling. (Action: ED - CMT)

5.4 Advisory

5.4.1 Inform sandpit owners/managers of the habitat requirements of the species. Encourage owners/managers to manage sections of their land in a manner conducive to the establishment of *G. luteoalbum*. They should be advised of the value of positive publicity should the species be found on their land. (Action: ED)

5.5 Future research and monitoring

5.5.1 Monitor the number and position of plants at the one known site annually in August/September. If changes occur in the plants' distribution, management should be adjusted accordingly. (Action: ED - C MT)

5.5.2 Make an extensive search of suitable habitat in the St Ouen's Bay area annually in August/September. Access to the private sand workings to be arranged and these areas to be included in the survey. (Action: ED - CMT, Société Jersiaise)

5.5.3 Encourage further research into the autecology of the species. Very little has been written on *G. luteoalbum* to date - in English language journals at least. Increased knowledge of the species' ecological requirements would be very useful in ensuring management for the species is carried out in the most effective way. (Action: ED)

5.6 Communications and Publicity

5.6.1 Publicity on the species existence and habitat requirements to be included in interpretative material in Jersey's dune systems. Emphasis can be placed on the species' rarity in the UK and the presence of the word Jersey, in its English name. (Action: ED)

5.6.2 Update Plantlife on the status of *G. luteoalbum* in Jersey, annually. (Action: ED)

5.7 Links with other Plans

5.7.1 None proposed.

Jersey Cudweed *Gnaphalium luteoalbum*

● records 1984 - 1998

Distribution of Jersey Cudweed in Jersey (by 1 Km square).

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

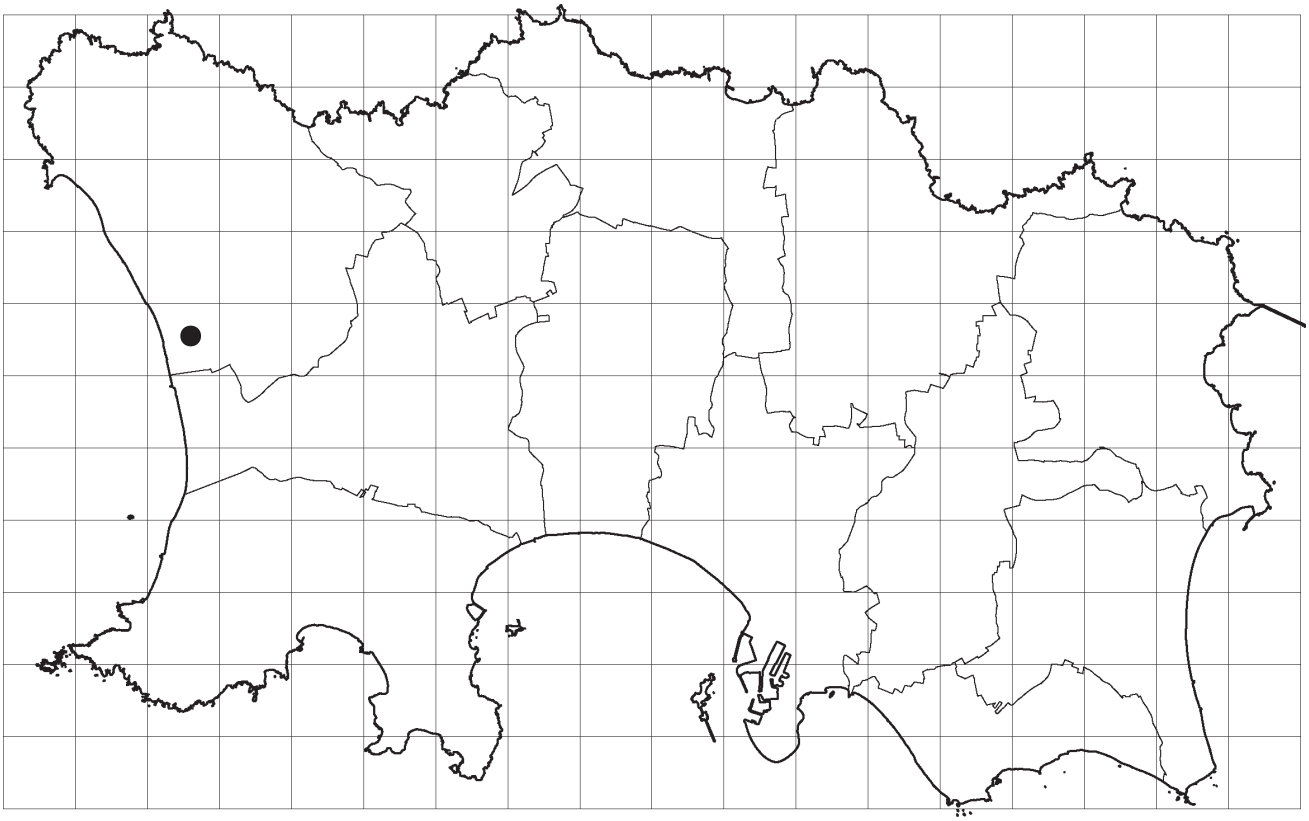


Photo Credit: Roger Long

Bio Diversity

Lizard Orchid

(Himantoglossum hircinum)

Action Plan

States of Jersey

1. Current status

1.1 *Himantoglossum hircinum* was rediscovered at Les Quennevais in the late 1980s having been absent from Jersey since 1970 (Banks, pers. comm.). In 1997 one flowering spike was present (see site description, below). Previously to 1970 appearances of the species were sporadic, one to 'several' (Le Sueur, personal records) present at Les Quennevais from 1918 to 1946 and up to sixteen between Le Chemin de Moulin and La Grande Route des Mielles, St Ouen between 1961 and 1970, when the site was destroyed by sand extraction.

1.2 Most of the known plants are on a small, south-facing ridge in a fairly stable area of dune. The surrounding area has been fenced off in order to prevent disturbance. Visits to the site were made between flowering and seeding so an assessment of the plant's seed production could not be made.

2. Current factors causing loss or decline

2.1 *H. hircinum* does not tolerate grazing - in the UK one population of 60 plants was eliminated within ten years by grazing by ponies (Rich, 1996). Rabbits graze the plants during winter and spring when just a rosette of leaves is present, and where this occurs flowering is prevented. There have been several instances where this is known to have occurred at Les Quennevais. Furthermore, rabbits are likely to graze off young plants before they are even recognisable (Rich, 1996). Thus, at Les Quennevais where rabbits are currently abundant, grazing is likely to be a major limiting factor on the population's survival and expansion.

2.2 *H. hircinum* requires an open habitat and thus cannot tolerate invasion by potentially dominant species. At Les Quennevais, Bracken *Pteridium aquilinum* is present in the immediate area of the single known plant. If Bracken became dominant it would almost certainly lead to the extinction of *H. hircinum* at this site. However, bracken is a poor tolerator of calcareous soils and can only spread where there is a large quantity of surface-lying litter (Grime *et al.,* 1990). It should therefore be relatively easy to keep under control.

2.3 Heavy trampling may damage seedlings (Rich, 1996). However, from personal observations it is clear most people stay out of the fenced area at Les Quennevais. This is therefore a minor factor.

3. Current action

3.1 *H. hircinum* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

3.2 The area is fenced off to prevent human disturbance.

3.3 The site is owned by the States of Jersey and also forms part of Les Blanches Banques SSI.

4. Action plan objectives and targets

4.1 To establish and maintain a viable population at the site.

4.2 To establish the location of any further plants, away from the immediate vicinity of the one known site, by 2008.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site safeguard and management

5.2.1 Maintain fence to exclude public access.

5.3 Species management and protection

5.3.1 None proposed.

5.4 Advisory

5.4.1 None proposed.

5.5 Future research and monitoring

5.5.1 Monitor scrub invasion and the openness of the turf by fixed-point photography. Baseline photographs for 1997 were taken during the course of this study. This process should be repeated annually and photographs compared to assess the extent of invasion by Bracken or closing of the turf. (Acton: ED - Countryside Manager)

5.5.2 Make an extensive search for *H. hircinum* rosettes at Les Quennevais between January and April annually. (Action: ED - CMT, Société Jersiaise)

5.5.3 Consult the biological flora for *H. hircinum*. Any new information pertinent to the species' conservation in Jersey should be added to this action plan. (Action: ED)

5.6 Communications and publicity

5.6.1 Place a notice, explaining the need for fencing, on or near the fence. The notice should, however, strongly discourage access to the enclosure. (Action: ED - CMT)

5.6.2 Use the media to publicise the successful recovery programme for the species if the number of flowering plants increases in future years, highlighting the importance of Les Quennevais for rare plant species. (Action: ED)

5.6.3 Update Plantlife on the status of *H. hircinum* in Jersey annually. (Action: ED)

5.7 Links with other Plans

5.7.1 None proposed.

Lizard Orchid *Himantoglossum hircinum*

● records 1984 - 1998

Distribution of Lizard Orchid in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

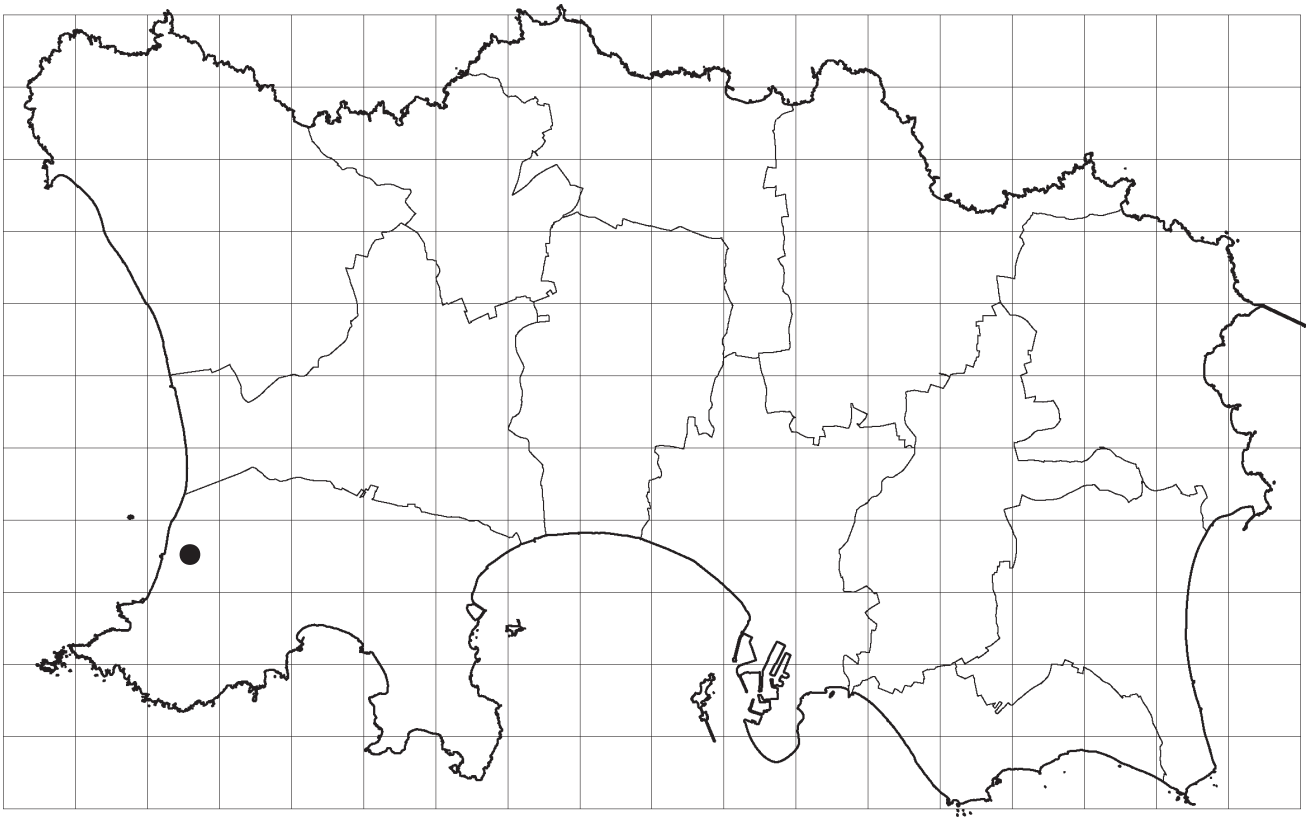


Photo Credit: Michael Troy

Bio Diversity

Toadflax-leaved St John's-wort

(Hypericum linariifolium)

Action Plan

States of Jersey

1. Current status

1.1 In the past, *Hypericum linariifolium* was recorded from Bouley Bay, St Catherine's Bay, Gorey, Noirmont and the cliffs between Beauport and La Corbière (Lester-Garland, 1903; Le Sueur, 1984).

1.2 *H. linariifolium* or 'intermediate' between *H. linariifolium* and *Hypericum humifusum* based on mounted specimens determined by Dr N.K.B. Robson in 1992 (held by Mrs Joan Banks). Note however that introgression between the two species, confirmed by genetic studies, may remain unsuspected and morphologically not apparent in the field (Kay & John, 1995), thus not ruling out a hybrid origin for all the Jersey plants.

1.3 Since 1996 *H. linariifolium* has been recorded in several bare areas on the steep, rocky, south to south-west facing slopes above L'Étacq amongst *Ulex europaeus* and *Erica cinerea*. Most plants appear to be *H. linariifolium* in its 'pure' form. Typical measurements are consistent with this i.e.; stems 15-25cm, leaves 17-18mm, petals 11-13mm, sepals 3-4mm. *H. humifusum* is however present in small quantity (<50 plants) on the clifftop and 'intermediate' plants were also observed.

1.4 *H. linariifolium* has been known at Noirmont for many years (Lester-Garland, 1903). It is found on a gentle slope, facing 30° west of south, at the top of the cliff, immediately west of the pond. *Ulex gallii* and *Erica cinerea* are dominant at the site with just a few small patches of rocky, bare ground where all the *H. linariifolium* plants are located. All the plants at this site appear to be 'intermediates', measurements support this i.e.; stems 7-15cm, leaves 7-10mm, petals 8-10mm, sepals 3-5mm. *H. humifusum* is present in the same area.

1.5 *H. linariifolium* was not known at this site prior to 1997. Plants are located on a steep, rocky slope, facing 20^{0} west of south, just south of the northern end of the wall dividing Portelet Common from the cliffs. Most of the site is made up of bare ground and rocks although a few seedlings of *Quercus ilex* have recently become established. All the plants at this site appear to be 'intermediates', typical measurements support this i.e.; stems 8-10cm, leaves 7-14mm, petals 10mm, sepals 3-4mm. *H. humifusum* is common on the clifftop, just the other side of the wall.

1.6 *H. linariifolium* was discovered at White Rock in 1988 (Banks, pers. comm.). Currently plants are found in two main areas; one an area of short turf to the south-east of the car park on a gentle, south-east facing slope, surrounded by a dense low scrub made up of *Ulex europaeus*, *Rubus* spps. and grasses such as *Dactylis glomerata*; the other an area of very closely grazed turf to the north-west of the car park on a gentle, south-west facing slope. Both 'pure' and 'intermediate' forms appear to be present in approximately equal numbers. Indeed, in the first area, over a ten metre strip 'pure' *H. linariifolium* can be found at one end with 'pure' *H. humifusum* at the other and 'intermediates' in between. Little obvious difference in conditions between each end of the strip was observed. Typical measurements of 'pure' plants are; stems 10-22cm, leaves 13-15mm, petals 10-13mm, sepals 4-5mm.

2. Current factors causing loss or decline

2.1 Hybridisation with Hypericum humifusum - From a genetic viewpoint this factor is the greatest threat to the persistence of the species (Kay & John, 1995). Indeed, with *H. humifusum* present close to all known populations of *Hypericum linariifolium* in Jersey together with the fact that hybrids are not always morphologically distinct, it may be that 'pure' populations no longer exist in Jersey. Furthermore, as 'intermediates' have been known in Jersey since at least 1872 'pure' populations may not have existed for many years.

2.2 Scrub encroachment - At several sites in England and Wales, gorse *Ulex* spp. has become dense and dominant destroying the micro-habitat for *Hypericum linariifolium* by increasing shade and raising soil fertility through nitrogen fixing (McDonnell, 1995). *Ulex europaeus* or *Ulex gallii* is present in large quantities at three of the four sites in Jersey and, unmanaged, may in time reduce the extent of suitable habitat for *H. linariifolium*. At the other site, Portelet Common, the presence of numerous *Quercus ilex* seedlings may have similarly detrimental effects on the species.

2.3 Trampling - Kay and John (1995) state that it is easy to damage *Hypericum linariifolium* plants and their micro-habitat by trampling. In Jersey, no members of the public were observed during the course of site visits at L'Étacq, Noirmont or Portelet Common. At La Tour de Rozel, there is heavy human usage although no damage was observed to any of the plants. Trampling is therefore regarded as only a minor threat to *H. linariifolium* in Jersey.

2.4 Small population effects - Plantlife (1997) identify 200 plants as a minimum viable population size for *Hypericum linariifolium*. Three of the four Jersey populations are considerably smaller than this therefore small population effects, such as genetic erosion, can be expected. Reduction in genetic diversity as a result of small population size may not be such a great threat however. Kay and John (1995) found there to be no significant difference in genetic diversity between plants from the Noirmont and La Tour de Rozel sites and those in South-west England, many of which have much larger populations.

3. Current action

3.1 *Hypericum linariifolium* is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

3.2 The sites at Noirmont, Portelet Common and La Tour de Rozel are all owned by the States of Jersey. The sites at Noirmont and Portelet Common are also within proposed SSIs. The L'Étacq site is not currently protected, although the southern boundary of Les Landes SSI lies approximately 200m to the north.

4. Action plan objectives and targets

4.1 To establish and maintain viable populations of the species at all known sites.

4.2 To establish the genetic status of the species in Jersey by 2010.

4.3 To ensure protection of all known sites by 2008.

4.4 To establish, by 2010, a complete picture of the species distribution in Jersey.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 None proposed.

5.2 Site safeguard and management

5.2.1 Remove gorse *Ulex* sp from a small area around the *Hypericum linariifolium* plants at Noirmont. *H. linariifolium* formerly occurred in good quantity at this site and its decline is likely to have been caused by gorse encroachment. Gorse clearance should be by cutting, the cut material should be removed and the stumps treated with glyphosate (Roundup) (Dolman & Land, 1995). Monitor for success (see 9.6.3) and extend the area cut if *H. linariifolium* benefits. Such management would also benefit other clifftop species such as *Tuberaria guttata*. (Action: ED - CMT)

5.2.2 Continue the practice of removing selected *Quercus ilex* at the Portelet Common site. (Action: ED - CMT)

5.3 Species management and protection

5.3.1 None proposed.

5.4 Advisory

5.4.1 Identify the landowners at the L'Étacq site and inform them of the presence of the species. As this is currently the most important site for the species in Jersey, draw up an agreement concerning future management. (Action: ED)

5.4.2 Inform TTS of the presence of the species at La Tour de Rozel. Future management at this site should only be carried out after consultation with the Countryside Manager. (Action: ED - Countryside Manager)

5.5 Future research and monitoring

5.5.1 Encourage research into the genetic status of the species in Jersey, for example through the funding of a PhD studentship. Consultation with experts on the species in the UK is essential before any projects are proposed. (Action: ED)

5.5.2 Monitor scrub encroachment by fixed-point photography. Such a scheme is already operating at Portelet Common and baseline photographs for the Noirmont and La Tour de Rozel sites were taken during the course of this study (chrome copies held by the Countryside Manager). Photographs should be taken annually and scrub encroachment assessed by comparison with photographs from previous years. Management work should be carried out if a combination of scrub encroachment and a decline in population is identified. Fixed-point photographs were not taken at L'Étacq due to the lack of a suitable location from which to position the camera. (Action: ED - Countryside Manager)

5.5.3 Monitor the size of all known populations annually. Monitoring should take place during the flowering period, between mid-June and mid-July. Management should be considered if significant declines in population size are consistently identified over a three year period, thus ruling out changes due to natural fluctuations. (Action: ED - Countryside Manager, Société Jersiaise)

5.5.4 Make an extensive search of dry, south-facing slopes where suitable habitat for *H. linariifolium* may exist. (Action: ED - CMT, Société Jersiaise)

5.6 Communications and publicity

5.6.1 Update Plantlife on the status of *H. linariifolium* in Jersey annually. (Action: ED).

5.7 Links with other Plans

5.7.1 None proposed.

Toadflax-leaved St John's-wort *Hypericum linariifolium*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Toadflax-leaved St John's-wort in Jersey, by 1 Km square.

Source: 'Flora of Jersey', Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey', Watson, 1997.

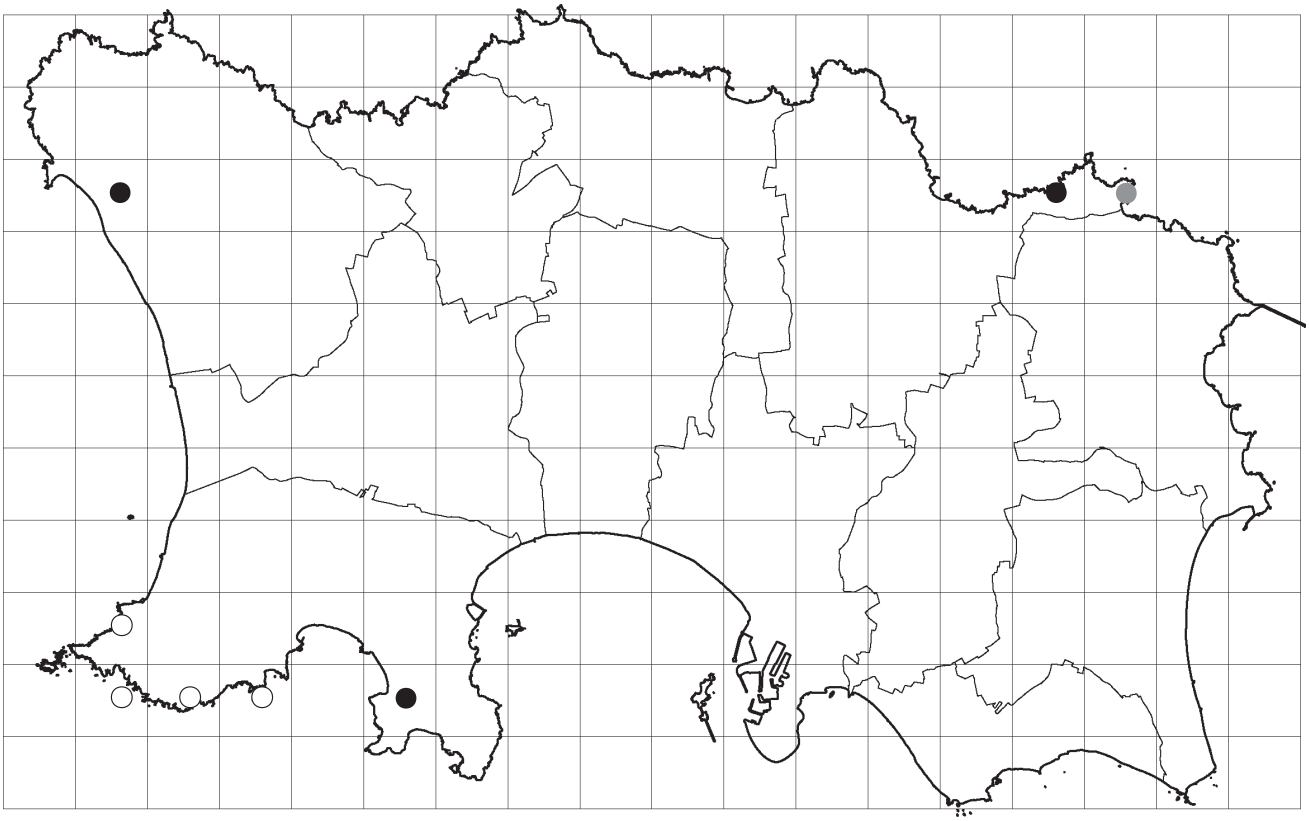


Photo Credit: Roger Long

Bio Diversity
Shore Dock
(Rumex rupestris)
Action Plan

States of Jersey

1. Current status

1.1 The status of *Rumex rupestris* in Jersey in 1997 is not yet known, due to the difficulty in identifying plants with certainty. The species was formerly known at Le Pulec, St Ouen; Petit Port, St Brelade and St Aubin's Bay (Banks, pers. comm.). However, these sites were all lost to the building of sea walls or the diverting of fresh water sources.

1.2 Several *Rumex* plants are present between boulders and on shingle to the west of the slipway at Le Grouet. Many are *R. crispus* but several possible *R. rupestris* plants are also present. At the head of the beach is a low grassy bank and a wall, on top of which are situated several houses. Freshwater runs down the wall or percolates through the bank in at least eight places, at five of these, water comes directly from pipes draining the houses. *Rumex* plants are all situated by these freshwater seepages. The site is very close to the road and thus could be at risk from human disturbance.

1.3 Several *Rumex* plants are present amongst large boulders, mostly within one metre of the foot of the low cliff between La Coupe and Le Saie. A minimum of 11 freshwater seepages are present at the cliff base, with several more dried-up seepages seen. Possible *R. rupestris* plants were found at five of these and at most seepages *R. crispus* was also present. The site is fairly undisturbed due to limited car parking space at either end of the beach.

1.4 Several *Rumex* plants are located at the foot of an east-facing cliff at the head of the beach. A small stream flows into the sea through Petit Port, Trinity the northern fork of which passes through the area in which the *Rumex* plants are found. Some of these plants were possibly *R. rupestris*. The site is relatively undisturbed due to its location, over a mile away from the nearest road.

2. Current factors causing loss or decline

2.1 Exceptionally high tides can pose a threat to the species. Plants at Le Grouet were lost during a high spring tide in 1996 (Banks, pers. comm.) and in the Scilly Isles, entire populations have been wiped out in this way (Parsloe, pers. comm.). This process is probably a normal part of the species' cycle of extinction and recolonisation, but with remaining populations very small and suitable habitat for recolonisation becoming more scarce it is now a serious threat to the species long-term survival. Possible sea level rise as a result of global warming is likely to exacerbate this threat. Additionally, a rise in sea level will force the species to retreat up the beaches at which it is found. At all Jersey sites however, beaches are backed by cliffs or sea walls making retreat impossible and thus sites for *Rumex rupestris* will be lost.

2.2 Kay and John (1995), suggest that heavy oil pollution, produced by the cleaning out of ships tanks before they reach port, has played a crucial role in the decline of the species by intercepting, trapping and killing the floating fruits upon which *Rumex rupestris* relies for dispersal. Other driftline species such as *Euphorbia peplis* have undergone similar declines in recent years, possibly for the same reason.

2.3 Three former populations of *Rumex rupestris* have been lost in Jersey due to the construction of sea walls. Although no sites are threatened by this factor at present, the species, which naturally undergoes periodic extinctions and recolonisations, will suffer from a loss of potential habitat for colonisation by the construction of sea defences at other sites. Furthermore, alteration of the coastline, can intensify erosion pressures further along the coast and thus may indirectly affect populations of *R. rupestris*.

2.4 Small populations are subject to increased risk of elimination by chance events, spring tides, for example, disease or seed predation. They can also be susceptible to genetic erosion, although King (1989) suggested that large amounts of genetic variation existed even in small populations of *Rumex rupestris*.

2.5 Disturbance and water shortages pose a threat to populations in the Scilly Isles (Parsloe, pers. comm.), although neither pose an immediate threat to current sites in Jersey. They should be monitored.

3. Current action

3.1 The species is on the proposed list of species to be protected by the Conservation of Wildlife (Jersey) Law 2000.

3.2 All current and recent sites are visited annually by the Botany Section of the Société Jersiaise, although in 1995 and 1996 exact counts of plants were not made.

3.4 All sites are thought to be owned by the Crown (Syvret, pers. comm.). None are included in the list of proposed SSIs.

4. Action plan objectives and targets

4.1 To maintain a minimum viable population at all currently known sites. (A minimum viable population is thought to be a total of six seeding plants).

4.2 To ensure protection of all currently known sites by 2008.

4.3 To restore viable populations to two former sites by 2015 if research in the UK finds that reintroduction is feasible.

4.4 To establish a monitoring programme whereby the size of all populations is monitored annually.

5. Proposed actions with lead agencies

5.1 Policy and legislation

5.1.1 Consideration of the habitat requirements and threats facing the species should be made when drawing up the forthcoming Integrated Coastal Zone Management Plan. (Action: ED)

5.2 Site safeguard and management

5.2.1 Do not allow planning permission for any development that may disrupt freshwater sources at existing *Rumex rupestris* sites. (Action: ED)

5.3 Species management and protection

5.3.1 Reintroductions of the species to be considered at La Saline and Le Sauchet if a trial reintroduction programme in the UK is successful. A reintroduction has a greater chance of success if donor plants/material are collected from as similar a habitat as possible to that at the reintroduction site (Kay & John, 1995). Therefore, for reintroductions to La Saline and Le Sauchet, La Coupe/Le Saie would seem to be the most suitable donor site. (Action: ED, Countryside Manager)

5.4 Advisory

5.4.1 Inform residents above the site at Le Grouet of the species' presence and requirements. Their co-operation is required if the population is to be successfully maintained at this site. (Action: ED)

5.5 Further research and monitoring

5.5.1 Monitor all current and recent sites annually in September when the species is most easily identified. The exact number, location and fruiting status of all plants should be noted. Additionally, any potential threats to each population should be monitored. (Action: ED - Countryside Manager, Société Jersiaise)

5.6 Communications and publicity

5.6.1 Maintain contact, established during the course of this study, with individuals involved in an experimental reintroduction programme in England. They should have a reasonable idea of the programme's success or failure. (Action: ED)

5.6.2 Maintain contact with staff at PLANTLIFE in order to keep up to date with current research into the species' autecology and genecology. (Action: ED)

5.6.3 Update PLANTLIFE on the status of *Rumex rupestris* in Jersey annually. (Action: ED)

5.7 Links with other Plans

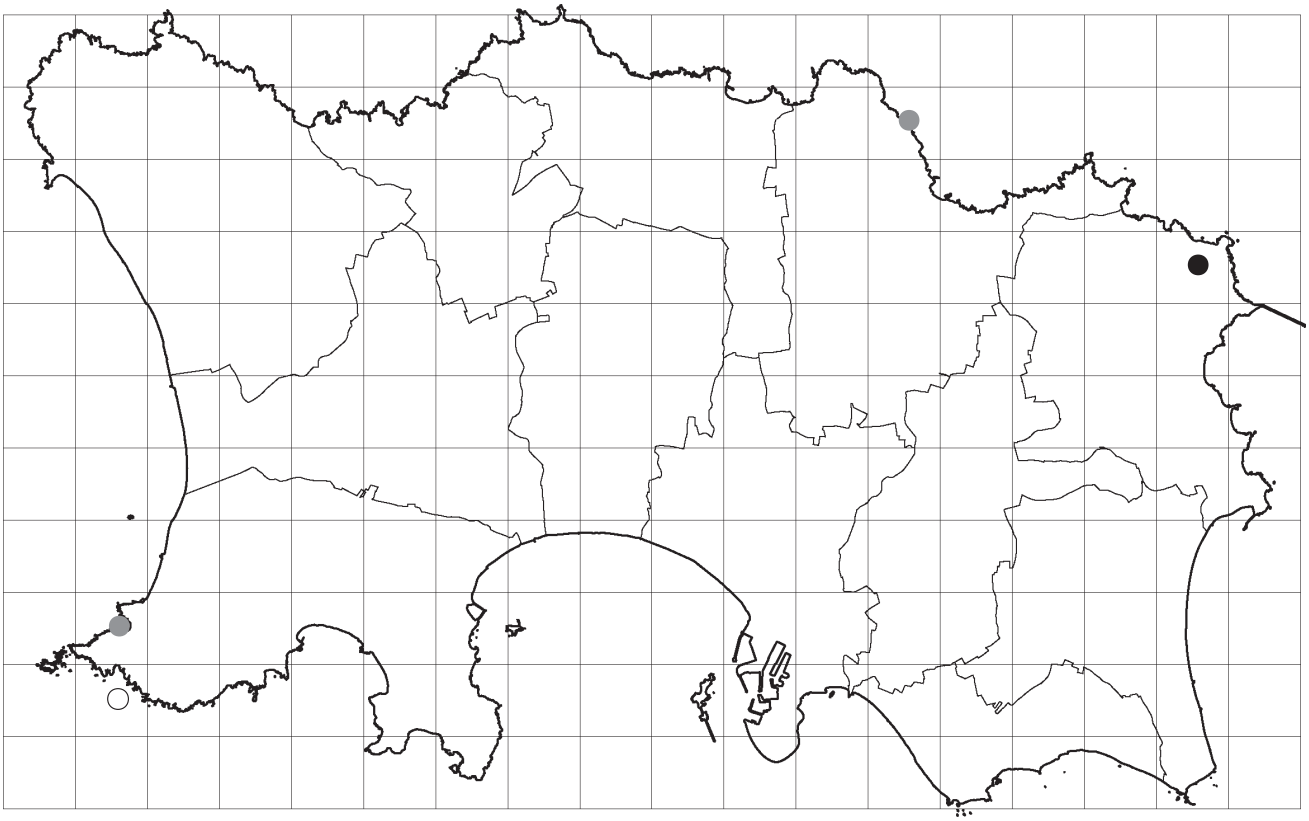
5.7.1 None proposed.

Shore Dock *Rumex rupestris*

○ records pre 1984 ● records before and after 1984 ● records 1985 - 1998

Distribution of Shore Dock in Jersey, by 1 Km square.

Source: 'Flora of Jersey' Le Sueur, 1984 & 'Species Action Plans for Threatened Plants in Jersey' Watson, 1997.



Bio Diversity

Eelgrass beds

(Zostera spp.*)*

Action Plan

States of Jersey

1. Current status

1.1 Eelgrass beds are found in muds, sands, intertidal and shallow coastal areas. There are 3 types, Dwarf Eelgrass - *Zostera noltii* found high on the shore, *Zostera angustifolia* found on the mid to low shore and *Zostera marina* found predominantly in the sublittoral zone (UK Biodiversity, 1995). All three species populate Jersey waters. Sites recognised to support Eelgrass beds include Rozel Bay (east Jersey), Bouley Bay (north coast of Jersey), St Catherine's Bay and Belcroute Bay. Other nursery areas which accommodate Eelgrasses are La Conchière, St Ouen's Bay (where *Zostera noltii* has been observed) and St Brelade's Bay (Meyer, 1993).

1.2 *Zostera* has many important functions in the ecology of intertidal locations. It supports high levels of juvenile species, such as bream and spider crabs, which seek protection whilst developing (Jackson *et al*., 2001). Eelgrass shoots provide a surface attachment for some species, whilst their roots stabilise the sediment, preventing movement from tidal flow and currents. Eelgrass meadows are also an important source of organic matter (UK Biodiversity, 1995).

1.3 There are a number of microhabitats that Eelgrass provides, these include the Eelgrass itself, sessile epifauna, infauna and free swimming species. Tidal exposure, salinity and the density of microhabitats dictates the diversity of species found in *Zostera.* However, diversity is generally highest in subtidal, perennial species (UK. Biodiversity, 1995). Sogard & Able (1991) compared two types of marine fauna habitats (*Zostera* beds and alga *Ulva lactuca*) rather than trying to compare a fauna rich habitat to that of sand. The study wanted to discover which supports epibenthic fish to a higher level. Though *Ulva* did provide refuge from predation *Zostera* was found to be superior.

1.4 Species inhabiting Eelgrass beds are numerous. Established sublittoral beds are often colonised by diatoms and algae such as *Enteromorpha spp* and *Rhodophysema georgii*. The soft sediment infauna includes amphipods, polychaete worms, bivalves and echinoderms.

1.5 Le Foll (1993) reports that juvenile spider crabs (commercially important in Jersey waters) are omnivorous, eating bivalves, echinoderms, gastropods, and polychaetes. They also feed on a variety of marine algae, including *Corallina*, *Griffithsia*, *Ceramium* and *Polysiphonia*, species of which maybe epiphytic on *Zostera*. This shows that *Zostera* is directly related to the sustainability of other species, which are commercially important to Jersey (Jackson *et al*., 2001).

1.6 Intertidal *Zostera* is also an important source of food for wildfowl, particularly Brent Geese and Wigeon which feed on intertidal beds (Jackson *et al*., 2001, UK Biodiversity, 1995). Adult fish frequently seen in *Zostera* beds include pollack, two-spotted goby and various wrasse. There are also two species of pipefish entirely restricted to Eelgrass. These are *Entelurus aequoraeus* and *Syngnathus typhie (*UK Biodiversity, 1995).

1.7 Areas of Eelgrass in Jersey are included in the south-east coastal RAMSAR sites, but no other protection has been established other than for *zostera* species growing in mobile gear prohibited zones(Sea Fisheries (Inshore Trawling), Netting and Dredging (Jersey) Regulations 2001). In the UK, Eelgrass beds are protected under SSSIs, SPAs (under the EC Birds Directive), voluntary MPAs (marine protected areas) and within Marine Nature Reserves (UK. Biodiversity, 1995).

2. Current factors causing loss or decline

2.1 Disease: In the 1930s a wasting disease (a fungus and slime mould) caused the decline of Eelgrass in the UK and Channel Islands (UK Biodiversity, 1995). Le Sueur (1967)) reported a decline in the numbers of Straight-nosed Pipefish (*Nerophis ophidion*) in Jersey, corresponding to the 1930s *Zostera* devastation (Rasmussen, 1977).

2.2 Natural cycles: Natural factors that effect the abundance of Eelgrass include: exposure to the air, storms, temporal patterns (may effect Eelgrass bed structure and composition of their fauna), seasonal patterns, day lengths, tidal amplitude and turbidity (effecting photosynthesis). All of these could have a negative effect on the diversity and abundance of *Zostera (*Jackson *et al.,* 2001*)*. Caddy (1986) discovered that climatic change influences primary production, which could be a concern because of the continuous increase in sea temperatures. Invasive species also need to be monitored to avoid competition on local species.

2.3 Physical disturbance: Dredging from commercial fishing vessels, trampling, coastal development and land reclamation are all factors which can reduce or destroy Eelgrass beds and the species which rely on them.

2.4 Nutrient enrichment: The impact of sewage outlets and agricultural run-off at low levels may increase production in *Zostera.* However, high nitrate concentrations have resulted in the decline of mature *Z. marina* Phytoplankton blooms. It also reduces *Zostera* biomass and its ability to penetrate to depth and increases the dominance of macroalgal organisms (UK Biodiversity, 1995).

2.5 Marine pollution: Tributyl tin and organic pollutants have been proven to reduce nitrogen fixation in *Zostera* and subsequently the health of the beds. As a consequence food chains often become saturated with the metal and organic pollutants (UK Biodiversity, 1995).

3. Current action

3.1 The ecological significance of Eelgrass beds is being realised and is being pushed to the forefront of the conservation and governmental agencies action and management plans (Leadbitter *et al.*, 1999). This interest has led to world-wide mapping of Eelgrass habitats and the need to understand human and natural impacts (Short and Wyllie-Echeverria, 1996).

3.2 Mapping of Eelgrass around Jersey has been developed over a number of years, (see map). However, a complete map of the exact location in all areas of the intertidal zones has not been established. A review on the importance of subtidal Eelgrass beds as a habitat for fisheries species was carried out by Jackson *et al.*, (2001).

3.3 Past research has shown significant evidence that Eelgrass beds are part of important inshore nursery areas. IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) published information on the fisheries of North Finistère (Jackson *et al.*, 2001). This is relevant to Jersey because it includes the Normano-Breton Gulf, where Jersey is situated (Rodwell, 1996). The guide provides information on species which are important to commercial fishery. These species include the Cuttlefish (*Sepia officinalis*) which is known to lay its eggs on *Zostera* (Jackson *et al.*, 2001). It also mentions the wet fish Sea Bass (*Dicentrachus labrax*) and Sole (*Solea vulgaris*) which are thought to utilize shallow inshore nurseries and potentially Eelgrass beds (Rogers *et al.*, 1998; cited in Jackson *et al.*, 2001).

3.4 Ronald Le Sueur (1967) developed a report on the marine species around Jersey with particular reference to commercially important types. Turbot, Brill, Plaice, Flounder, Pollack, Sea Bass, Red Mullet and Sea Bream, have been found to utilize shallow inshore nursery areas where Eelgrass is prominent (Rogers *et al.*, 1998; cited in Jackson *et al.*, 2001). The report also mentions that juveniles of the Grey Gurnard (*Trigla gurnardus*) are often seen in pools among *Zostera* on the South coast of the island. The Broad-nosed Pipefish (*Entelurus aequoraeus*) is reported to be restricted to Eelgrasses (Davidson, 1997). Le Sueur (1967) also recorded an abundance of juvenile Greater Pipefish (*Syngnathus acus*) in the *Zostera* in St Aubin's Bay.

4. Action plan objectives and targets

4.1 To accurately map all varieties of Eelgrass distribution with the aim to maintain and if necessary extend Eelgrass beds in Jersey's coastal waters.

4.2 Promote a feasibility study into the current status of Eelgrass in Jersey waters and establish whether there is a need to activate a programme to restore degraded or damaged Eelgrass.

4.3 Compile a cost analysis of all proposed project work.

5. Proposed actions with lead agencies

5.1 Policy and Legislation

5.1.1 Consider increased awareness of inshore Eelgrass beds by extending RAMSAR sites (an area that has been designated a 'Wetland of International Importance' as defined by the 'RAMSAR Convention' of 1971) (RAMSAR website, 2003) or create Marine Protected Areas to cover significant areas of Eelgrass. (Action: ED)

5.1.2 Ensure that relevant fisheries legislation and port/harbour regulations protect Eelgrass in vulnerable locations.

5.2 Site safeguard and management

5.1.4 A current area of concern is boats mooring in and around St Catherine's Bay. It is thought that mooring boats in or near Eelgrass beds may adversely affect the Eelgrass itself and inhabiting species. This impact could be reduced with the introduction of fixed mooring lines, preventing boats from dropping mooring in vulnerable areas.

5.3 Species management and protection

5.3.1 Ensure that Eelgrass beds are protected from damage arising from commercial and recreational activities.

5.4 Advisory

5.4.1 Assess whether Eelgrass is appropriately protected by existing legislation and if not develop appropriate protection

5.5 Future research and monitoring

5.5.1 Accurately map the location of all species of Eelgrass in Jersey waters. Establish which of the sites fall within protected areas. If required the protected sites could be expanded or new ones introduced. It is essential that a sufficient amount of each Eelgrass species is represented within these protected areas.

5.5.2 Assess the ecological role of *Zostera* around Jersey for all species.

5.5.3 Map Eelgrass beds by acoustic surveys (Munro *et al.,* 1998), satellite sensors, aerial photography, compact Airborne Spectrographic Imager or remote sensing via non-commercial satellite (Green, 2000).

5.5.4 Discover if high nutrient loads from agricultural sources are adversely affecting Eelgrass areas. If negative run-off is discovered sites

could then be protected by nitrate vulnerable zones and an expectable level of nutrient rich run-off be published (UK Biodiversity, 1995).

5.5.5 Ensure that coastal zone management plans incorporate the conservation needs of Eelgrass, integrating them with the management of other habitats and species (UK Biodiversity, 1995).

5.5.6 Discover and monitor the cause of any degradation to Eelgrass beds, e.g. mooring lines, and establish a solution, e.g. introducing static mooring lines in vulnerable areas.

5.5.7 Develop a strategy with a standardised procedure to monitor Eelgrass beds (Jackson *et al.,* 2001).

5.5.8 Discover the feasibility of a regeneration programme for areas which have seen a decline in Eelgrass abundance and areas which would benefit from the introduction of Eelgrass.

5.5.9 Discover the optimal depth for the most productive Eelgrass nurseries and whether patch size and shoot density effect population abundance (Jackson *et al.,* 2001).

5.5.10 Investigate the overall value of Eelgrass beds for all species locally as part of an ecosystem approach.

5.6 Communication and Publicity

5.6.1 Actively promote awareness to coastal users, providing information on what damage they could be causing and how they could stop or reduce their impact. This could be achieved by providing a detailed report, describing how to minimise the impact on Eelgrass and the value of Eelgrass. This report should be distributed to local authorities, fishermen, recreational boat-owners and fishermen. It is essential to enlist public support to successfully protect *Zostera*. (Action: ED)

5.6.2 Use a variety of research institutes and coastal managers as a source of information and data exchange to develop conservation strategies for Eelgrass beds (UK Biodiversity, 1995).

5.7 Links with other Plans

5.7.1 None proposed.

Eelgrass Beds *Zostera* Spp.

● records from 2003

Distribution of Eelgrass Beds in Jersey, by 1 Km square.

Source: 'Importance of Eelgrass beds as a habitat for fishery species around Jersey', Jackson, 2003 & Pers. Comms. Fisheries Section.

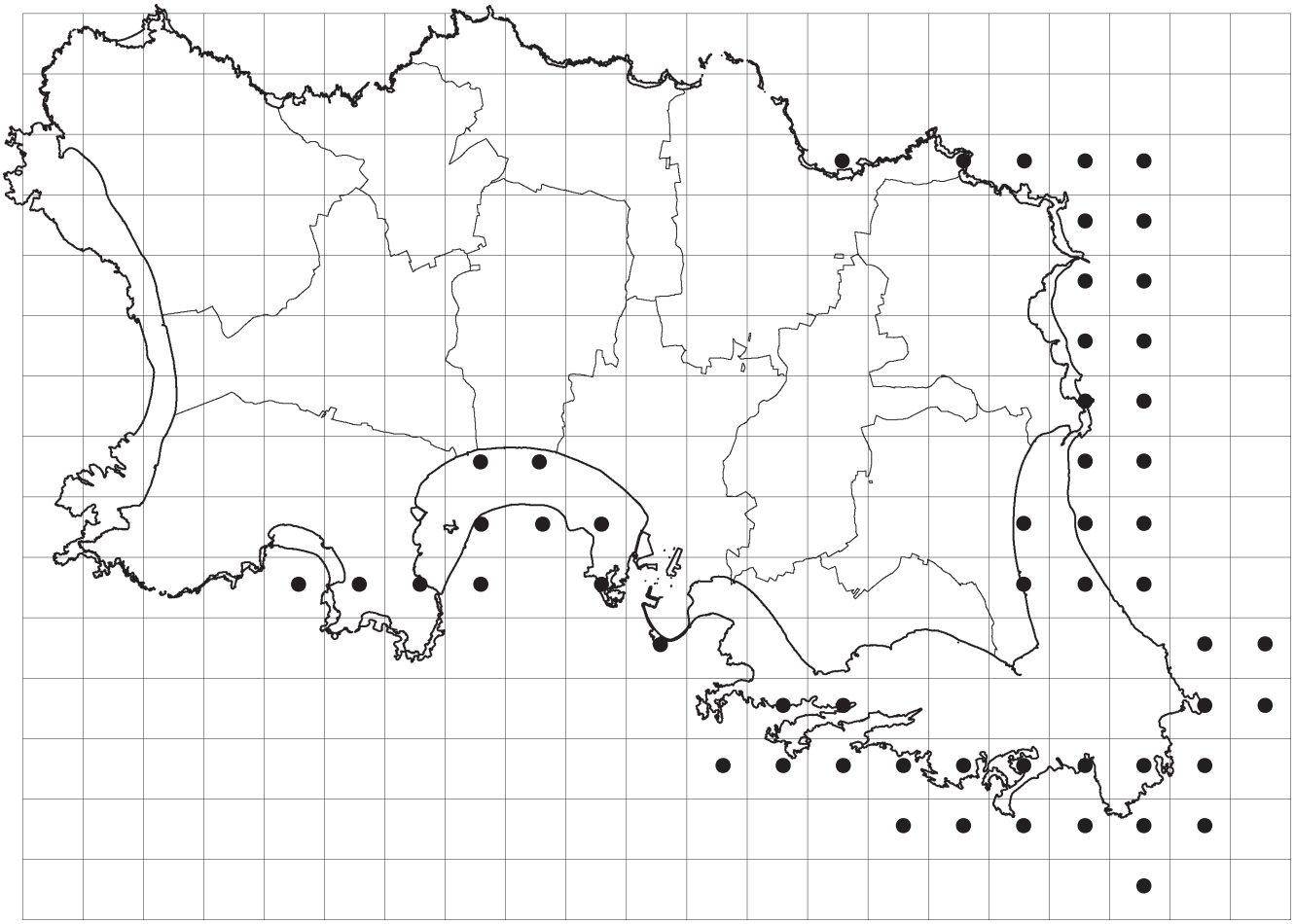


Photo Credit: Sue Daly