Contorted-pod Evening-primrose and Silky Beach Pea in Island View Beach Regional Park - 2014

Prepared by Aruncus Consulting July 31, 2014

Acknowledgements

Marilyn Fuchs (formerly CRD Parks) provided oversight and insights regarding the management of rare species at Island View Beach. Jenifer Penny (BC Conservation Data Centre) and Brenda Costanzo (BC Ministry of Environment) provided information on the reported occurrences of rare species in Island View Beach Regional Park.

Cover Photographs

Top: A view of habitat where Contorted-pod Evening-primrose was observed.

Bottom left: Contorted-pod Evening-primrose.

Bottom right: Silky Beach Pea..

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1 Introduction

Island View Beach Regional Park is a popular recreation area on the Saanich Peninsula. The expansive beaches, sand plains and dunes provide an attractive place to explore with a well-established walking loop much favoured by walkers and picnickers. The park, which measures approximately 52 hectares, contains relatively intact coastal sand ecosystems including beaches, dunes and sand plains. There are small internal wetlands within the coastal sand ecosystems as well as an extensive wetland area on the western edge of the park.

Coastal sand ecosystems are rare in British Columbia and provide habitat essential to numerous rare species and ecological communities. The interplay of marine and terrestrial ecological forces shape and form coastal sand ecosystems. Winds and currents combine to create a complex pattern of sand movement. Tides and tidal surges erode and redeposit sand along the beaches; they also move logs along the beaches and sometimes well inland during violent storms. Wind and salt spray, as well as the infertile and drought prone sandy soils, create a harsh environment where only a small suite of stress-tolerant plants may survive.

A number of rare plant species have been reported from Island View Beach Regional Park including:

- Contorted-pod Evening-primrose (*Camissonia contorta*)
- Silky Beach Pea / Grey Beach Peavine (*Lathyrus littoralis*)
- Yellow Sand Verbena (*Abronia latifolia*)
- Black Knotweed (*Polygonum paronychia*)
- Fleshy Jaumea (*Jaumea carnosa*)
- Beach Bindweed (*Calystegia soldanella*)

The report of Fleshy Jaumea is suspect – there is no precise information confirming its presence at Island View Beach and there is little or no suitable habitat within the regional park. It is known to occur in adjacent lands but the report for Island View Beach is probably a mapping error created by the vague nature of old records. American Glehnia is also known from adjacent lands but neither has been reported from Island View Beach Regional Park.

Silky Beach Pea had been recently reported from the regional park (Costanzo 2011); previously it had only been reported from the adjacent Indian Reserve.

The other four rare plant species have been long known to occur in Island View Beach Regional Park.

Two of these species, Contorted-pod Evening-primrose and Silky Beach Pea are listed under the federal Species-at-Risk Act (SARA). Yellow Sand-verbena, though not listed under the SARA, is, an obligate host of a SARA-listed moth present at Island View Beach thus the vigour of Yellow Sand-verbena at Island View Beach is also therefore of major conservation significance.

Proper management of SARA-listed species within the park is dependent upon accurate information and effective monitoring. The purpose of the 2014 studies reported in this paper is to update information on the abundance and distribution of Contorted-pod Evening-primrose and

Silky Beach Pea in Island View Beach Regional Park, as well as their condition and the threats they face. Information on each species is provided separately.

2 Silky Beach Pea

2.1 Background

Silky Beach Pea (*Lathyrus littoralis*) is an extremely rare plant in Canada, proposed for protection under the federal Species-at-Risk Act (SARA)[1]. It is a rhizomatous perennial herb that grows 10-60 cm tall. Silky Beach Pea has branched and densely grey-silky shoots bearing alternate and pinnately compound leaves with 4-8 leaflets and no tendrils. The pea-type flowers have smaller white lower and side petals but the larger upper petals are pink, red or purple. The pods are about 3 cm long and 1 cm wide, grey-silky, and contain 1-5 seeds. Silky Beach Pea is restricted to rapidly-drained dunes, sand plains and sandy beaches along Pacific Ocean shores. It does not tolerate shading and only occurs in open areas dominated by low grasses and forbs with little or no cover of native trees or shrubs. Since 1930, in Canada, there has been a 50-90% decline in the areal extent of the sparsely-vegetated habitats favoured by the Silky Beach Pea. Invasive alien grass species (primarily European Beachgrass, *Ammophila arenaria*) pose the greatest threat to Silky Beach Pea. Several populations of Silky Beach Pea are threatened by off-road vehicle use and/or trampling by hikers. Silky Beach Pea is threatened by habitat loss as the result of storm surges associated with climate change. In areas where deer have been introduced, or occur in high numbers as the result of human actions, Silky Beach Pea is also threatened by herbivory (Fairbarns 2012).

Silky Beach Pea has been known from Island View Beach as well as nearby areas (including Sidney Island) for many decades and has probably been present there since before European settlement. Historical records show that its distribution in the area has contracted substantially over the past few decades. By 2005 it was only known from two small fragmentary remnants, one on the Tsawout Indian Reserve and the other in Cordova Spit Municipal Park (Fairbarns 2012).

In 2006, J. Penny and M. Donovan (BC Conservation Data Centre) observed a patch of approximately 68 shoots over an area of approximately 6 m^2 in open sand, near log debris. They used a GPS unit to estimate location. Later, when transcribing the field data onto a GIS system, it appeared that the UTM coordinates recorded from the GPS unit referred to an area with evidently unsuitable habitat. Based on their recollection of the field trip CDC staff mapped a polygon along the sand flats and beaches of Island View Beach Regional Park sufficiently extensive to ensure that the patch they had observed was included. This polygon was many times larger than the 6 m^2 patch they observed and was intended to show an area which could be re-examined to determine the precise location of the Silky Beach Pea patch (J. Penny. pers. comm., June 3, 2014).

[1] The proposal is undergoing public consultation and formal protection under SARA is anticipated by September 2104

2.2 Methods

In 2014, Fairbarns revisited the area identified by Penny and Donovan to more precisely pinpoint the location of Silky Beach Pea within Island View Beach Regional Park. The site was surveyed three times between early May and early June since a single survey might not have coincided with the period during which the plants would be most visible. A side trip was made on the date of the early June survey to determine the maturity of plants in the population in the Cordova Spit Municipal Park.

During each survey, Fairbarns walked transects at approximately 5 m intervals throughout the entire area within the polygon mapped by Penny and Donovan. Extra attention was made to small areas of open sand within dense areas of beach logs.

2.3 Results and Discussion

Silky Beach Pea was not detected within Island View Regional Park during the three surveys. On the date of the final survey (June 3, 2014), Silky Beach Pea plants in the nearby municipal park could be easily detected from a distance of greater than 15 metres.

Following the June 3 survey, Fairbarns contacted the BC Conservation Data Centre and asked them to re-examine the original field notes made on May 11, 2006. When the notes were re-examined it was discovered that the UTM coordinates had been incorrectly transcribed and that the population they had examined was one that had been reported by Fairbarns in 2005, outside of the regional park (J. Penny pers. comm. June 5, 2014).

It thus appears that Silky Beach Pea has not been seen at Island View Beach Regional Park, contrary to earlier reports. Nevertheless, the regional park has abundant suitable habitat and likely supported Silky Beach Pea at one time. It would be relatively easy to establish a subpopulation within the area of the regional park currently set aside for the protection of Contorted-pod Evening-primrose without having a negative impact on the latter species or causing any significant constraints on recreational use. There are additional areas outside of the fence which have suitable habitat for Silky Beach Pea, have other rare plant community values, and could be set aside without significantly affecting recreation opportunities. The SARA recovery strategy for Silky Beach Pea has not yet been prepared but given the small size of the existing Island View Beach-Cordova Spit population it will undoubtedly call for an increase in extent and abundance and the establishment of a subpopulation within the regional park would be of great value.

2.4 References

Fairbarns, M.D. 2012. COSEWIC Status Report on Silky Beach Pea (*Lathyrus littoralis*) in Canada. Six month interim status report prepared for the Committee On The Status Of Endangered Wildlife In Canada. 32 pp.

Penny, J. 2014a. pers. comm. E-mail to M. Fairbarns, June 3, 2014 from Jenifer Penny, BC Conservation Data Centre.

Penny, J. 2014b. pers. comm. E-mail to M. Fairbarns, June 6, 2014 from Jenifer Penny, BC Conservation Data Centre.

3 Contorted-pod Evening-primrose

3.1 Background

Contorted-pod Evening-primrose (*Camissonia contorta*) is an extremely rare plant in Canada, proposed for protection under the federal Species-at-Risk Act (SARA). It is a slender, annual herb, occasionally growing to 40 cm long, arising from a slender taproot. Its stem is wiry, usually branched, peeling below and often sprawling. Its leaves are linear to narrowly elliptic, 5-30 mm long, and entire or remotely toothed. The flowers are borne on a short stalk or are unstalked. Each flower consists of four sepals and four petals. The petals are 3-5 mm long and yellow, fading to red. The flowers are often difficult to detect, opening intermittently when weather conditions are ideal. The stems, leaves and capsules are often deep red, particularly in unshaded environments (Fairbarns 2006).

Contorted-pod Evening-primrose inhabits sandy backshore habitats. It is dependent on moderate levels of sand erosion and deposition that reduce competition from, larger, less stress-tolerant plants. Contorted-pod Evening-primrose is restricted to sites that have negligible tree or shrub cover, and a sparse cover of herbs, mosses and lichens. It tends to avoid the most unstable areas of sand and is usually most numerous in semi-stable sand plains. Surprisingly, the largest plants may occur on slightly more active dune blow-outs, where it occurs in low densities but individual plants may produce flat-lying branches up to 100 cm long (Fairbarns 2006).

There are eight known populations of Contorted-pod Evening-primrose in Canada, scattered over an area of approximately 750 km^2 on southeast Vancouver Island and the Gulf Islands. Canadian populations of Contorted-pod Evening-primrose face a number of threats including loss of habitat, trampling, competition from invasive alien plants including Scotch Broom (*Cytisus scoparius*), and stabilization of sand habitats leading to the establishment of shrub-land and/or forest. Stabilization of sand habitats is often facilitated by the establishment of a barrier of European Beachgrass (*Ammophila arenaria*) along upper beach habitats which trap sand that would otherwise be blown inland, maintaining the semi-active sand plain habitats essential to Contorted-pod Evening-primrose (Fairbarns 2006).

Contorted-pod Evening-primrose has been known from Island View Beach as well as nearby areas (including Sidney Island) for many decades and has probably been present there since before European settlement (Fairbarns 2006). Fairbarns has monitored the extent of the subpopulation in 2002, 2004, 2005, and 2006; during this period the abundance and areal extent of the subpopulation within the CRD Park has shrunk steadily (Fairbarns 2004, 2006).

3.2 Methods

In 2014, Fairbarns surveyed the site three times between early May and early June since a single survey might not have coincided with the period during which the plants would be most visible. During each survey, Fairbarns walked transects at approximately 2 m intervals throughout the entire area where Contorted-pod Evening-primrose had been seen one or more times during the 2002, 2004, 2005, and 2006 surveys. The surveys were also extended into areas outside of the CRD habitat protection fence in case the population had expanded into adjacent, hitherto unoccupied habitat.

The population size had peaked by the June 3 survey, and weather forecasts at that time indicated that a warm dry spell was anticipated, which would be expected to initiate the annual population decline. On that basis, a detailed survey was conducted on June 3 to map and count the population. The mapping and population count was conducted as follows:

- Patches of Contorted-pod Evening-primrose that had been detected in the earlier (May) surveys were marked with orange flag stakes.
- The entire area where Contorted-pod Evening-primrose had been detected in one or more of the 2002-2006 surveys was divided into survey sub-units varying in size from 100 to 1,000 square metres and the subunit boundaries were marked with yellow flag stakes.
- Hands-and-knees surveys were conducted in each subunit. Each mature (flowering or fruiting) plant was temporarily marked with a bamboo skewer. When an entire subunit had been searched, the distribution of the marked plants was marked up on a high-precision air photograph using readily discernable reference objects. The maximum uncertainty associated with mapping was approximately 2.0 metres and most of the mapping was accurate to within 1 m.
- After the distribution of Contorted-pod Evening-primrose within a subunit had been mapped, the bamboo skewers were collected and counted to provide a complete count of plants within the subunit.

The marked up air photo print was used to digitize a polygon using Quantum GIS, a Geographic Information System. The polygons were saved as an ESRI shapefile and submitted separately.

3.3 Results and Discussion

In 2014, Contorted-pod Evening-primrose was found in three areas within Island View Beach Regional Park (Figure 1). All of the plants bore either flowers or fruit; no vegetative plants were found. Presumably low vigour, non-reproductive seedlings had already died. A small proportion of the plants had already started to senesce but the amount of senescent tissue did not exceed more than 10% of any of the plants. This suggests that the population was surveyed during the ideal window for establishing population size and extent in 2014.

The northern polygon contained 18 plants, all in flower and most also bearing some mature fruits. Three of the plants were growing on the most heavily trodden portion of the trail and the other 15 plants occurred on lightly disturbed areas within 3 m of the trail.

The central polygon contained 76 mature plants, all in fruit and many still with at least some flowers. Most of the plants were on moderately disturbed or lightly disturbed areas on the east-facing slopes of the dune which occupies the polygon. Fewer than 10 plants were found on heavily trodden areas within the polygon.

The southern polygon contained 55 mature plants. All of the plants bore mature fruit and most also had at least some flowers. The plants in the southern polygon were most abundant on undisturbed or very lightly disturbed soil; fewer than 10 were on moderately disturbed microsites, and none were present on the trail itself.

Figure 1. Contorted-pod Evening-primrose polygons, June 2014.

Overall, the subpopulation of Contorted-pod Evening-primrose in Island View Beach Regional Park is in moderately poor condition. The plants tend to rather small but that is equally true of the other Canadian populations. They were reproducing well considering their small stature. There was no evidence of herbivory or disease.

The habitat was in rather poor condition despite the fencing established by CRD Parks. The path along the edge of the shrub land continues to receive extremely heavy use and the higher portion of the dune where the middle polygon is shown in Figure 1 has received an unprecedented degree of trampling, precisely where the highest concentration of Contorted-pod Evening-primrose in the park formerly occurred. Some of the trampling damage may have been averted had the area been more clearly signed; several park visitors explained that they were walking through the fenced area because they were unaware of the fact that it was supposed to be off-bounds to walkers and one even explained that she thought the area was fenced off as a dog use area. As well, the fencing itself is falling into disrepair and the tumbled down remains of the fencing at the northeast corner of the protected area had collapsed in such a fashion that it now directs foot traffic into the very area it was intended to protect.

The abundance of Scotch Broom has increased and this has prompted informal broom clearing; regrettably some of the cleared broom was piled along the path between the middle and southern polygon where it may have smothered some Contorted-pod Evening-primrose. The population of Dalmation Toadflax (*Linaria genistifolia ssp. dalmatica*) has continued to expand southward from the Tsawout Indian Reserve into previously unoccupied portions of the Contorted-pod Evening-primrose subpopulation. There is no clear evidence whether or not there are changing patterns of sand movement that might affect habitat quality for Contorted-pod Evening-primrose.

3.4 References

Fairbarns, M.D. 2004. Potential Recovery Actions for Contorted-pod Evening-primrose in CRD Parks. 16 pp.

Fairbarns, M. 2006. Recovery Strategy for Contorted-pod Evening-primrose (*Camissonia contorta*) in Canada. Prepared for Parks Canada Agency. 23 pp.

4 Recommendations

- Repair broken fencing.
- Provide clear signage indicating the fragility of the habitat and the presence of an endangered plant species.
- Monitor traffic to assess the efficacy of the fencing and signs, making further changes if necessary.
- Make a small collection of seeds of Contorted-pod Evening-primrose and, in partnership with the Coastal Ecosystems Recovery Team, use it in a propagation facility to grow large plants with numerous capsules from which seed may be collected. The seed thus grown may be used to expand the area occupied by the existing subpopulation to the full extent occupied during the past 13 years. No more than one capsule should be collected from any plant and no more than 15 capsules should be collected in total.
- Collect seed from the nearby population of Silky Beach Pea and, in partnership with the Coastal Ecosystems Recovery Team, use it to grow plants in a propagation facility for

eventually out-planting into sand plain habitat within the regional park to reduce the probability of extirpation of the Island View Beach/Cordova Spit population.

5 Rare Plant Observation Form

B.C. Conservation Data Centre
FIELD SURVEY FORM (PLANTS)

Project name: Island View Beach 2014

Species: *Camissonia contorta* (Contorted-pod Evening Primrose)

Name of surveyor: Matt Fairbarns
Contact: 2130 Kings Road, Victoria BC Canada V8R 2P9; aruncus_consulting@yahoo.ca
Survey Date: June 3 2014
Specimen Collection # & Herbarium: none collected
UTM grid reference: ZONE NAD 83 see shapefile submitted separately
Did you use a GPS unit to determine this UTM point? **Y** Precision of point (+/- metres) 10 m
Habitat: sand flats above high tide line, Island View Beach Regional Park

Topographic features: **Elevation:** 2 m **Slope:** level **Aspect:** n/a

Light:	**Position:**	**Moisture:**
Open	Level	Xeric

Population Size:
Estimated Number of Individuals:
149 mature individuals in three polygons

1. North polygon: 18 mature individuals
2. Middle polygon: 76 mature individuals
3. South polygon: 55 mature individuals

Area covered by population:
About 350 m^2

1. North polygon: 153 m^2
2. Middle polygon: 126 m^2
3. South polygon: 71 m^2

Landscape context

Landscape context presents major limitations on the occurrence.
Fragmentation/Connectivity: The surrounding landscape is a heavily-fragmented shoreline. Suitable open sheet sand and dune habitats are rare and widely separated in the region.
Species Composition: On most coastal sand environments in the region, the native vegetation is too abundant to allow for open microsites suitable for *Camissonia contorta*.
Biological Structure: Species richness and species evenness are unlikely to present a problem.
Ecological Processes: Successional processes on other coastal sand ecosystems in the area are not suited to *Camissonia contorta*.
Abiotic Factors: Sand flow on coastal sand ecosystems in the area is not suited to Camissonia contorta.

Condition of Occurrence:

The occurrence itself is in moderately poor condition.
Reproduction and Health: The plants show moderate to low vegetative vigour and moderate and reproductive vigor. There was no evidence of disease or herbivory sufficient to have a significant impact on reproduction and survival.
Ecological Processes: Natural processes do not pose a significant threat to the long-term viability of the

population.

Species Composition: The species richness does not place significant limitations on the site suitability for *Camissonia contorta*. The presence of Scotch Broom (*Cytisus scoparius*) is likely to limit *Camissonia contorta* unless steps are taken to control the broom..

Abiotic Physical/Chemical Factors: At present, heavily trampling by park visitors has greatly reduced the extent of suitable habitat for *Camissonia contorta*. Otherwise, abiotic factors on site are presently unlikely to be limiting to *Camissonia contorta*. The presence of European Beachgrass (*Ammophila arenaria*) has little immediate impact but as the *Ammophila* population expands it may choke off sand movement, eliminating the habitat conditions that now support *Camissonia contorta*.

Notes: The site is on a CRD regional park