

Monitoring and Restoration of Rare Ecosystems Gulf Islands National Park Reserve

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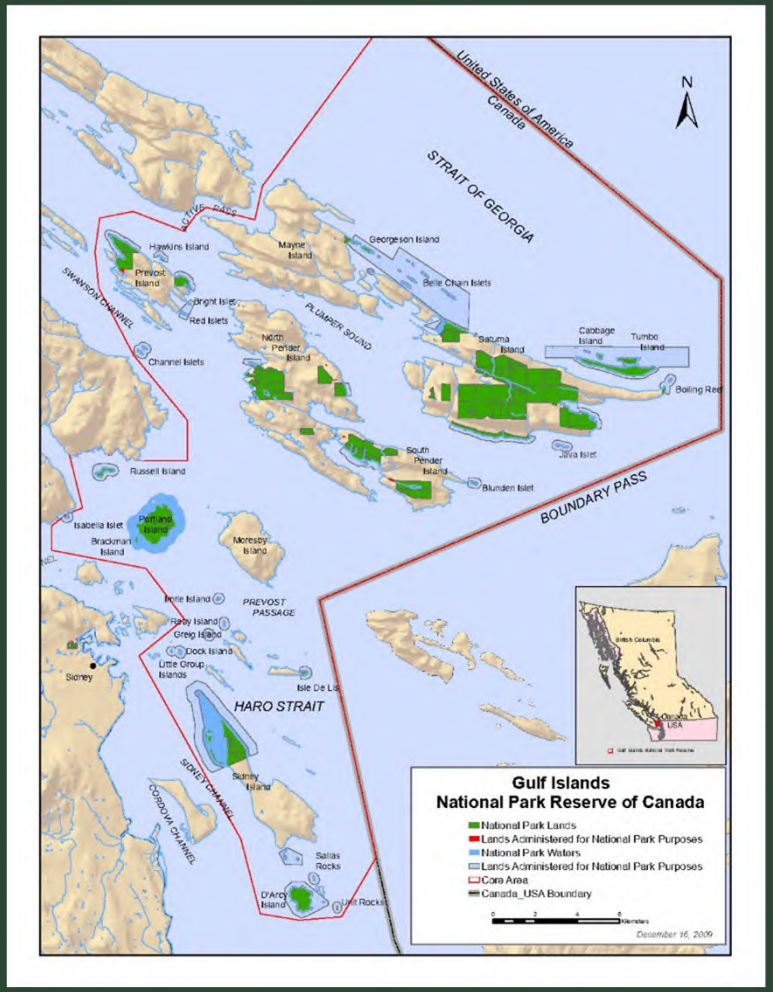
Outline

- Gulf Islands National Park Reserve
- Ecological Integrity (EI) monitoring framework
- What we are seeing
- EI monitoring and Active Management
- Case study: coastal sands and species at risk

Gulf Islands National Park Reserve

- 15 Islands and numerous islets
- 34 km² land base
- 26 km² marine area
- Fragmented
- Surrounded by urban areas
- Protection
- History of human use



What is Ecological Integrity (EI)?

Defined as:

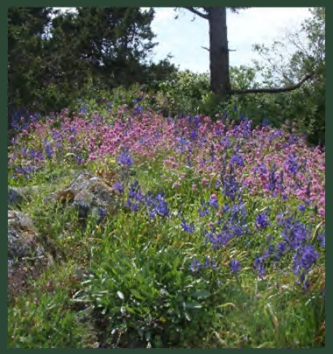
"...a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes."

Iain Reid

Ecological Integrity Monitoring

The primary objectives are to understand:

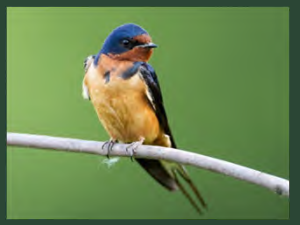
- The state of ecological integrity
- How it is changing over time
- How management activities affect ecological integrity

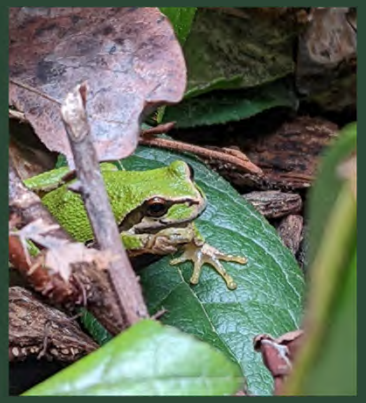


Issues That Could Threaten EI Values

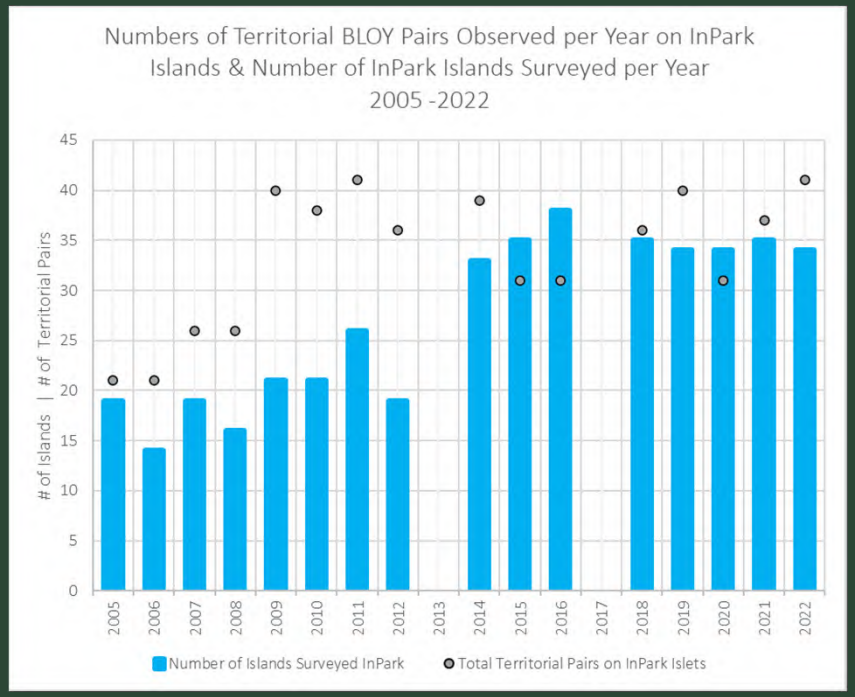
- Hyperabundant browsers
- Hyperabundant geese
- Invasive plants
- Altered/reduced fire regimes
- Legacy of land modification
- Fragmentation & adjacent land use
- Pollution/ nutrients/ turbidity
- Boats
- Climate change!

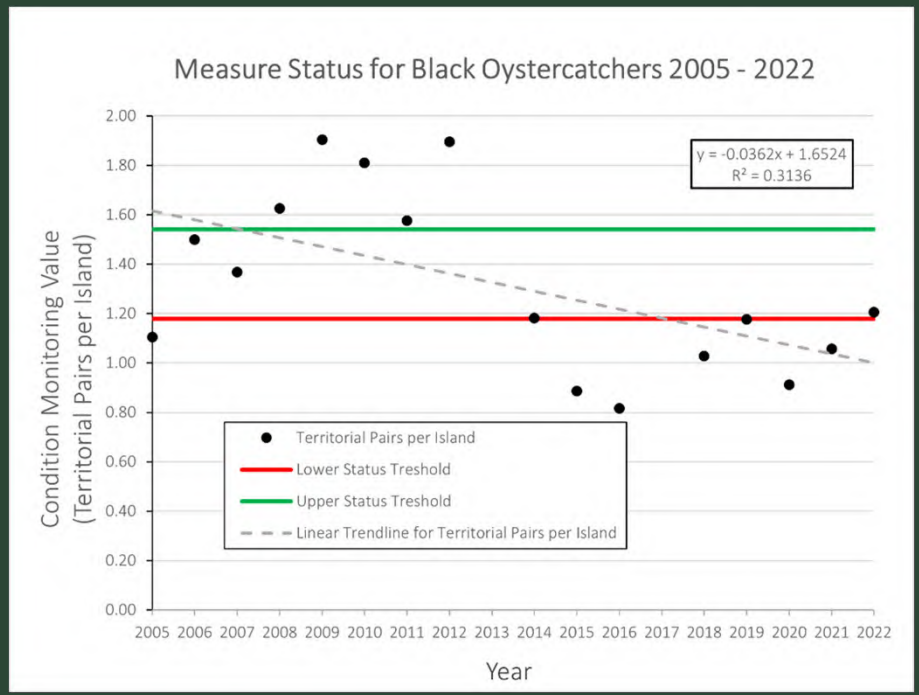
Indicator Ecosystems	Measures
Coastal\Marine	Eelgrass Bivalves (clams) Coastal Processes Black Oystercatchers Invasive Plants – islets Coastal Sands Vegetation
Forest	Songbirds Garry Oak Encroachment Deer Landscape Diversity
Freshwater	Salmonids Amphibians Water Quality Water Quantity Invasive plants





Indicator Ecosystem: Coastal/Marine
Measure: Black Oystercatchers



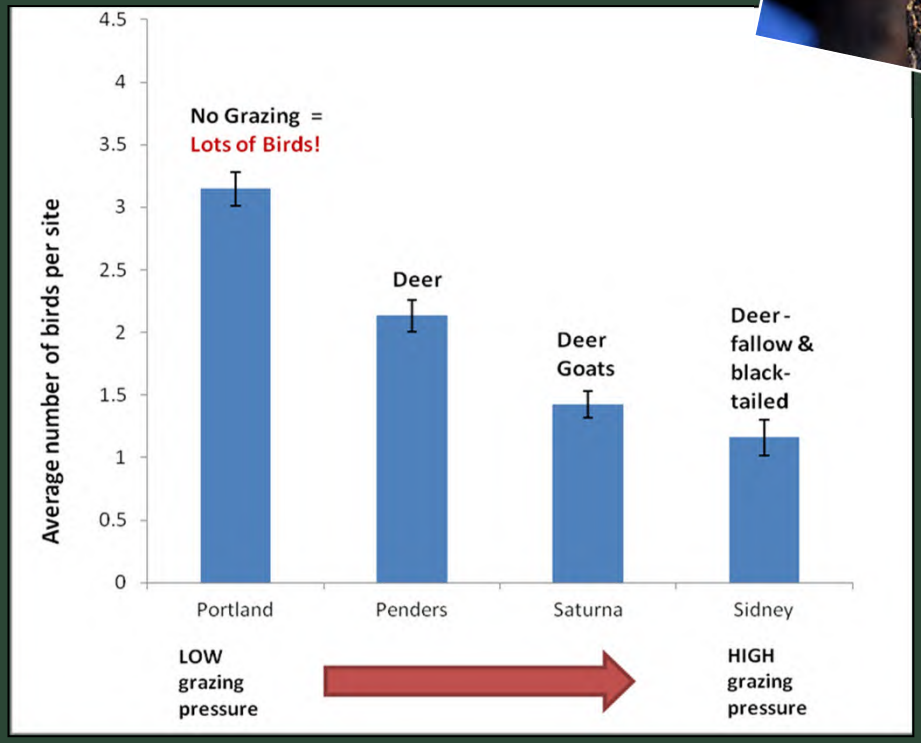


Measure: Invasive Plants on Islets

Small protected islets have high ecological value

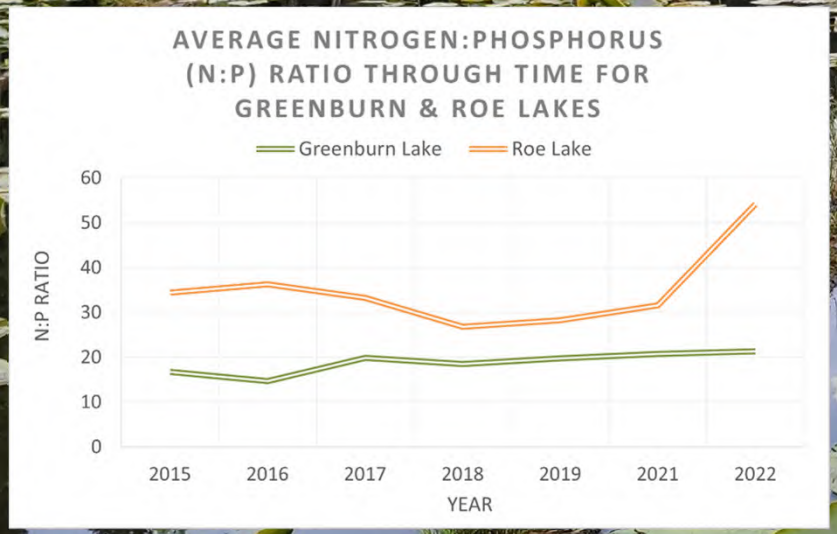
- Rare species
- High plant diversity
- Garry oak ecosystems

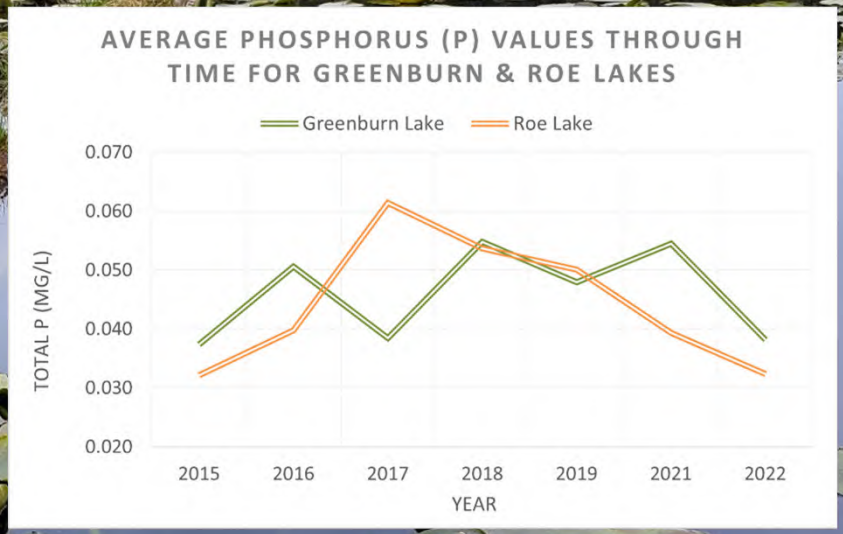
Indicator Ecosystem: Forest
Measure: Songbirds



Indicator Ecosystem: Freshwater
Measure: Water Quality

Average N:P ratio and Total Phosphorus





Measure: Amphibians

American Bullfrog (non-native)

Rough-skinned Newt

Long-toed Salamander

Pacific Treefrog

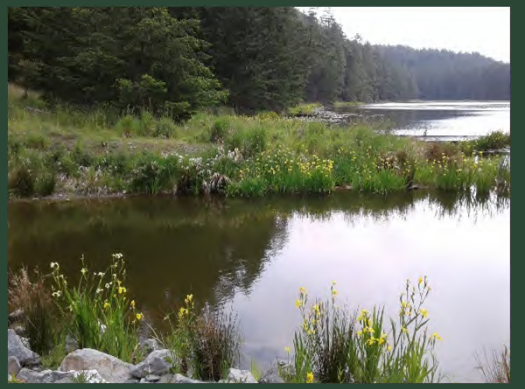
Red-legged Frog

What is the condition of our measures?

Good	Fair	Poor	In Development
Eelgrass fish	Black Oystercatchers	Eelgrass Health	Coastal Erosion
Water quality	Songbirds	CSE Vegetation	Garry Oak Encroachment
Invasive Plants (islets)	Salmonids	Bivalves (clams)	Forest Understory Health
Deer		Freshwater invasive plants	Amphibians

Active Management

- Hyperabundant deer populations and forest health – Sidney Island
- Sea Gardens – ecocultural restoration
- Coastal Sands Ecosystems – Sidney Island
- Garry Oak – associated ecosystems on islets



Conservation and Restoration (CoRe) Program

- Parks Canada's national funding program which provides short-term (1-5 years) resources for national parks, national historic sites and national marine conservation areas to undertake:

  - restoration actions to improve the status or trend of an ecosystem that is in poor or fair condition

  OR

  - recovery actions identified in action plans for species at risk

Conservation and Restoration Program

Parks Canada Parcs Canada

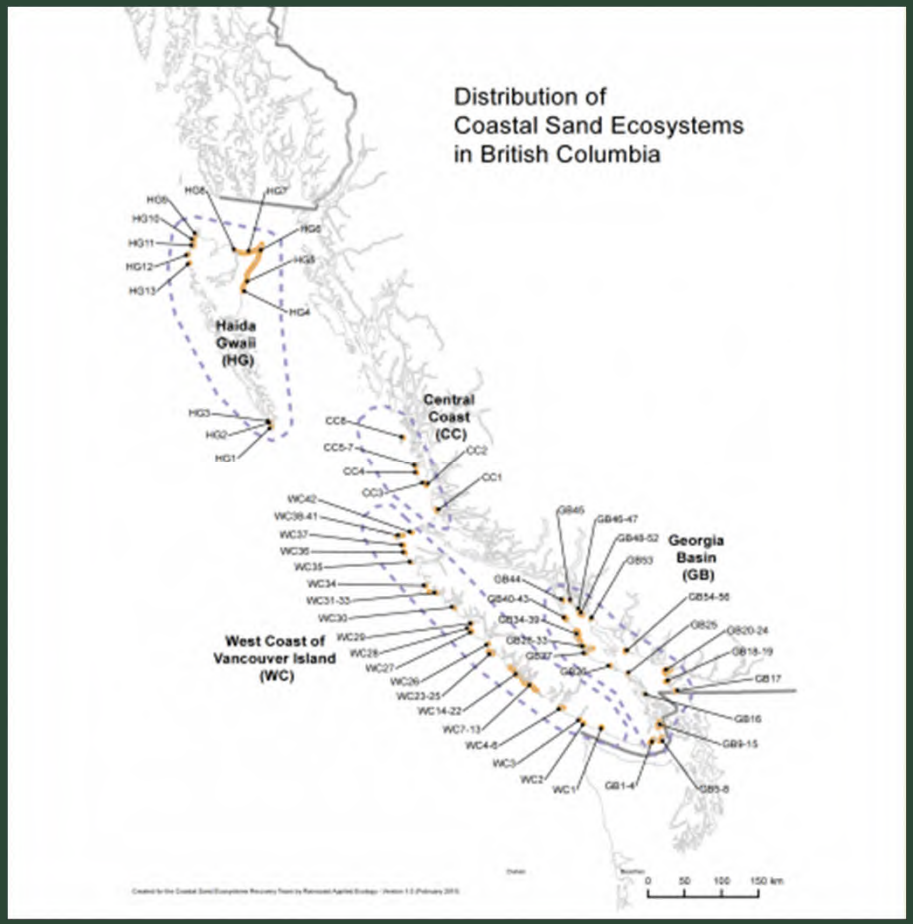
Canada

GINPR has 3 active CoRe projects:

- FOREST ECOSYSTEM
  SḴŦÁMEN QENÁŁ,ENEȻ SĆA -
  “Taking Care of Sidney Island”
- COASTAL ECOSYSTEM
  Sea Gardens
- SPECIES AT RISK
  Growing Together

Coastal sand ecosystems

- Rare in BC. Contain several red-listed ecosystems and SAR



Coastal sand ecosystems

- GINPR protects a significant example of CSE in the Georgia Basin

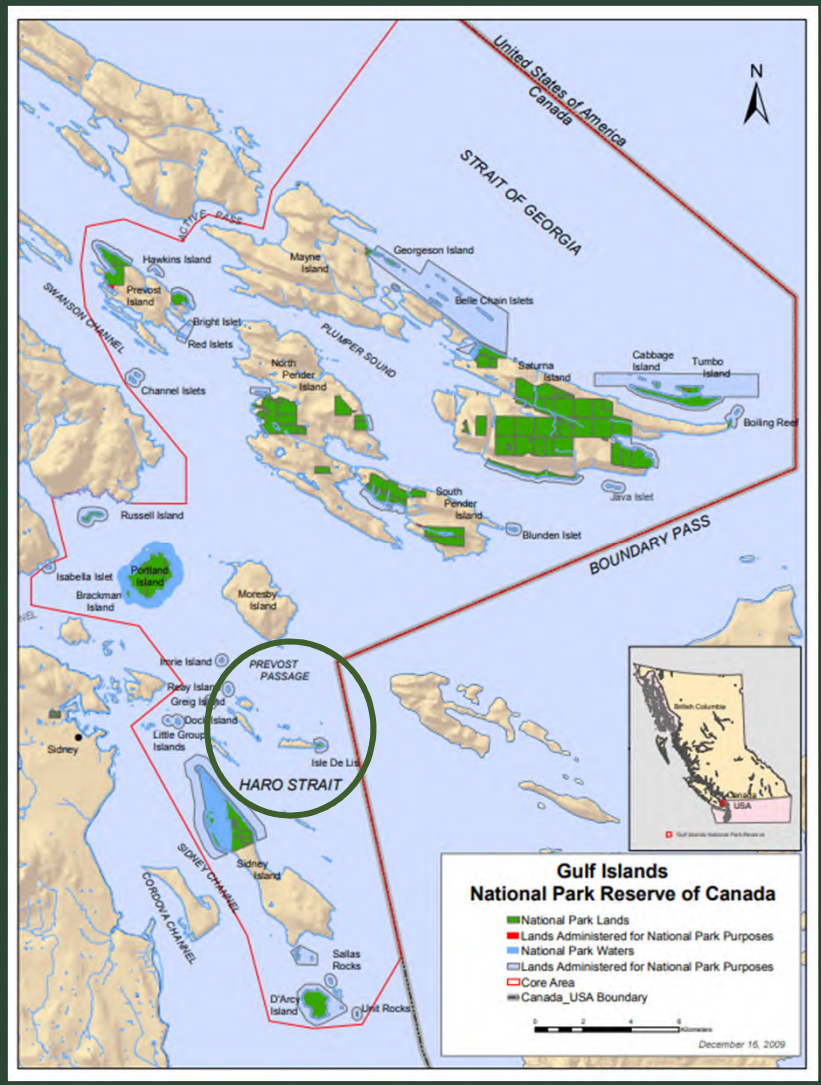
- Sidney Island (Parks Canada)
- Island View Beach (CRD)
- James Island (Nature Conservancy Canada)
- TIXEN (Tsawout First Nation)

Attributes of coastal sand ecosystems

- Beaches, spits, and dunes in which sand is the dominant substrate
- Sparsely-vegetated ecological community (bare sand common)
- Sand movement
- Foraging, nesting, and refuge habitat for shorebirds, songbirds and waterbirds
- Critical habitat for several species at risk

Coastal sand ecosystems in GINPR

SḰELŦÁMEN (Sidney Spit)



Threats to coastal sand ecosystems

1. Encroachment and stabilization
2. Loss of sand movement and bare sand

Why?

- Invasive plants
  - Scotch broom
  - European beach grass
- Bryophyte and lichen 'crust'
- Woody debris
- Trampling and other disturbance by visitors and dogs
- Deer browsing
- Sea level rise / storm surge / climate change

Invasive plant removals

Scotch broom

- All mature Scotch broom was removed
- ~3000 m^3 treated
- Biomass burned on site
- Minimal resprouting
- Seedlings from seed bank require annual treatment

Before

After

Invasive plant removals

European beach grass

- ~482 m^3 treated
- Annual repeated treatments needed as resprouts from rhizomes
- Biomass burned on site annually

Volunteer Program


Greater Victoria Green Team


UVic Field School


UBC Parks Canada Club


UVic


Camosun


CSEE Conference


Volunteer Victoria


Individuals


UVic Parks Canada Club

Species at risk recovery

- Ecosystem restoration targets 6 federally and provincially listed species at risk

Common nighthawk

Edwards' beach moth

Contorted-pod evening primrose

Silky beach pea

Yellow sand verbena

American Glehnia

Species at risk recovery

- Augmented populations of rare plants by sowing additional, nursery-grown seed or plants into prepared habitat
- Partnership with Species at Risk Nursery at Fort Rodd Hill NHS

Augmentations to date:

- Contorted-pod evening-primrose (endangered)
- American glehnia (blue listed)
- Silky beach pea (threatened, red listed)
- KEXMIN / Consumption Plant (culturally-important species)






Monitoring

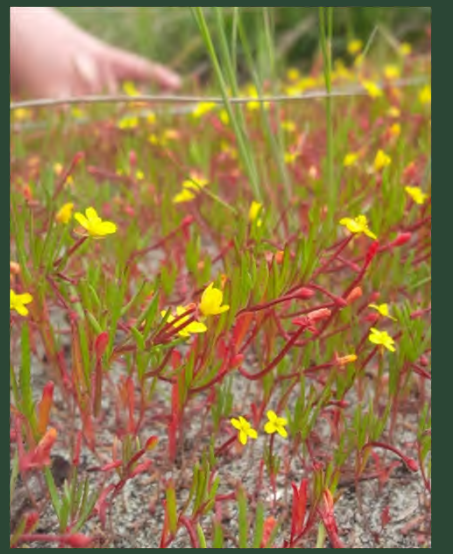
- **Vegetation monitoring**
  - Decrease in cover of invasive shrubs/trees from 59% to <1%
  - Amount of bare sand increased from 1.1% to 17.3%
- **Species at Risk monitoring**
  - Population increases for contorted-pod evening-primrose and silky beach pea
  - Stable counts for nesting pairs of common nighthawk

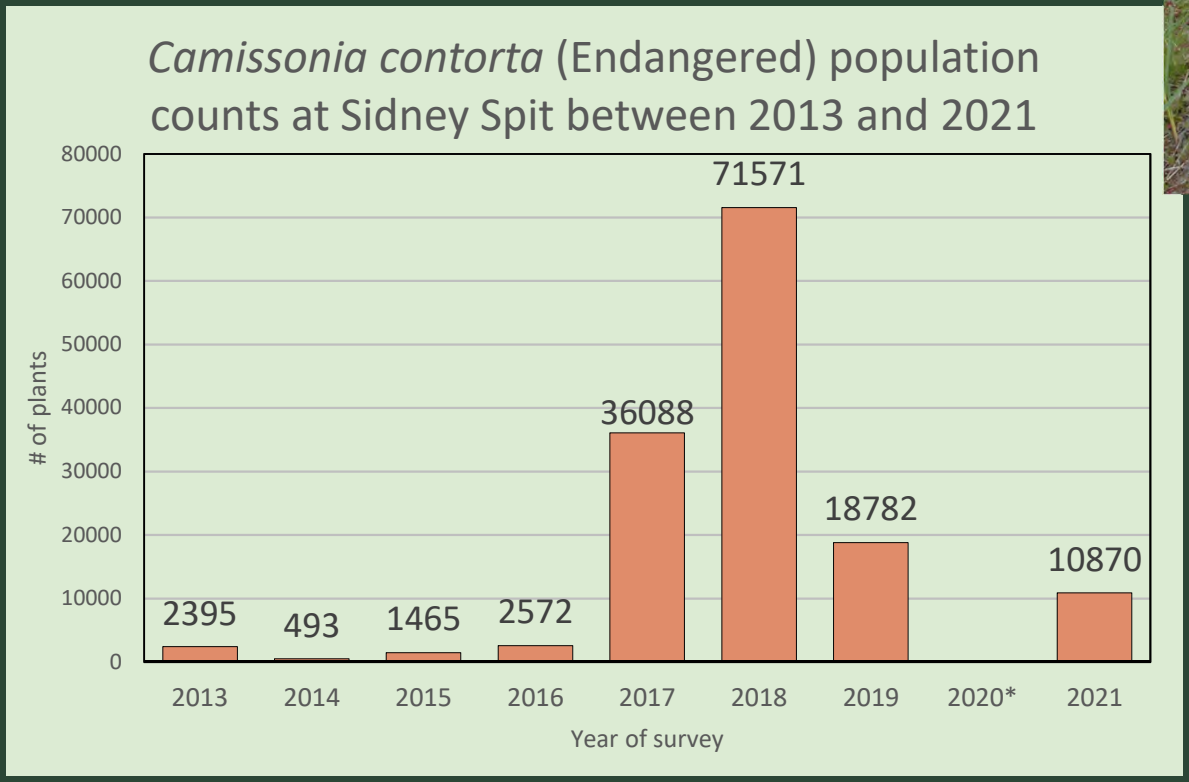
Silky Beach Pea - Before

Silky Beach Pea - After

Contorted-pod Evening-primrose

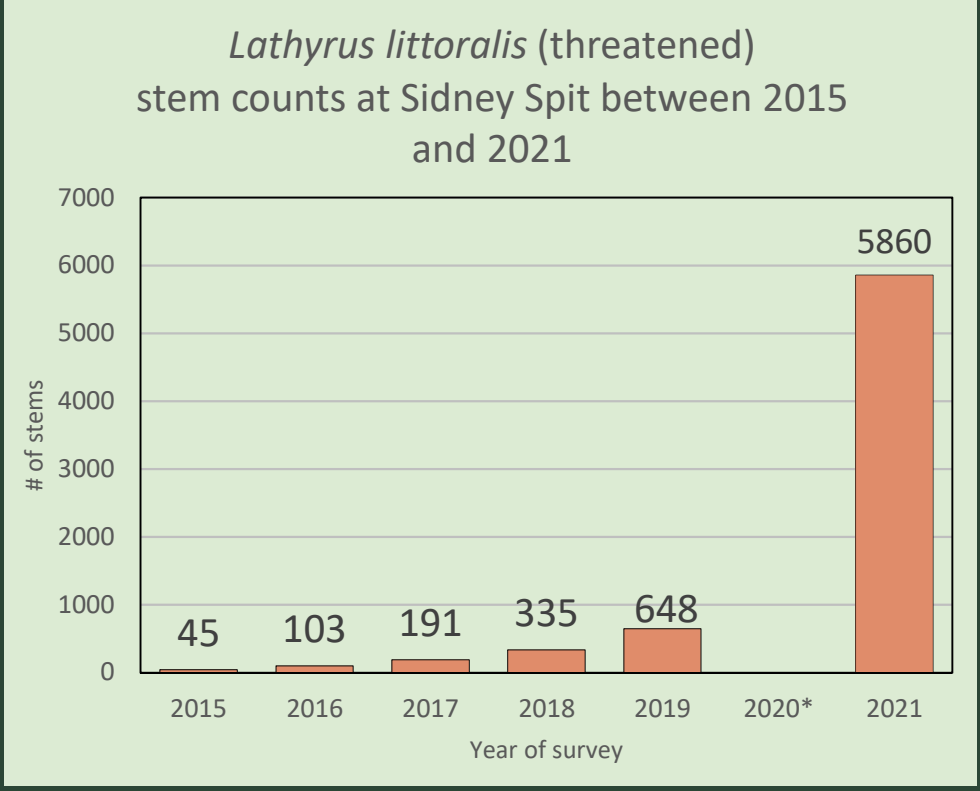
Camissonia contorta (Endangered)





Silky Beach Pea

Lathyrus littoralis (Threatened)



Other coastal sand species have benefited from habitat restoration

Yellow Sand Verbena (*Abronia latifolia*)

American Glehnia (*Glehnia littoralis*)

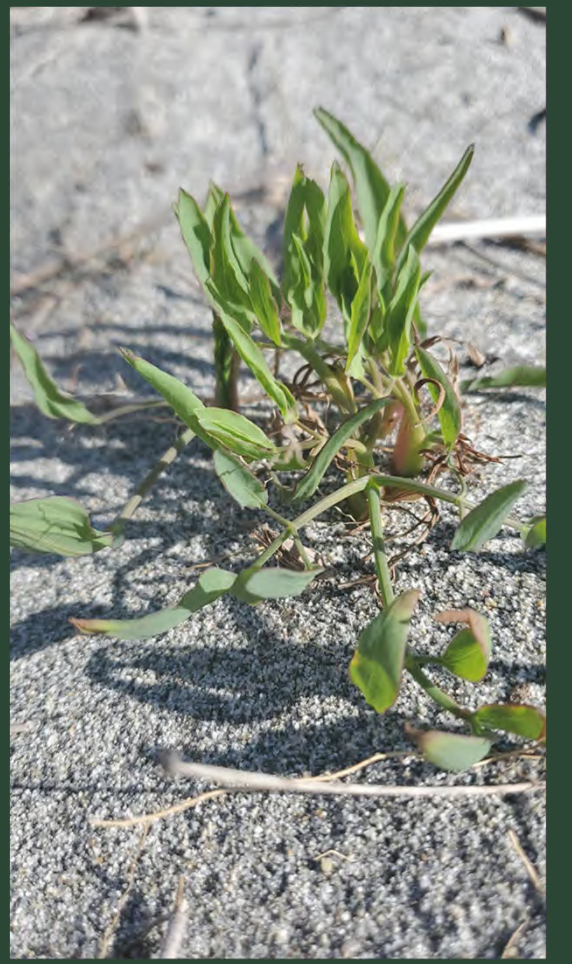
Large-headed Sedge (*Carex macrocephala*)

Collaboration with Indigenous partners

- Provided land-based education for school groups
- Collaborated with the W̱SÁNEĆ Environment Committee and Language Committee on interpretive resources

Artwork by W̱SÁNEĆ artist Sarah Jim

John-Bradley Williams sharing stories with Shoreline Middle School students

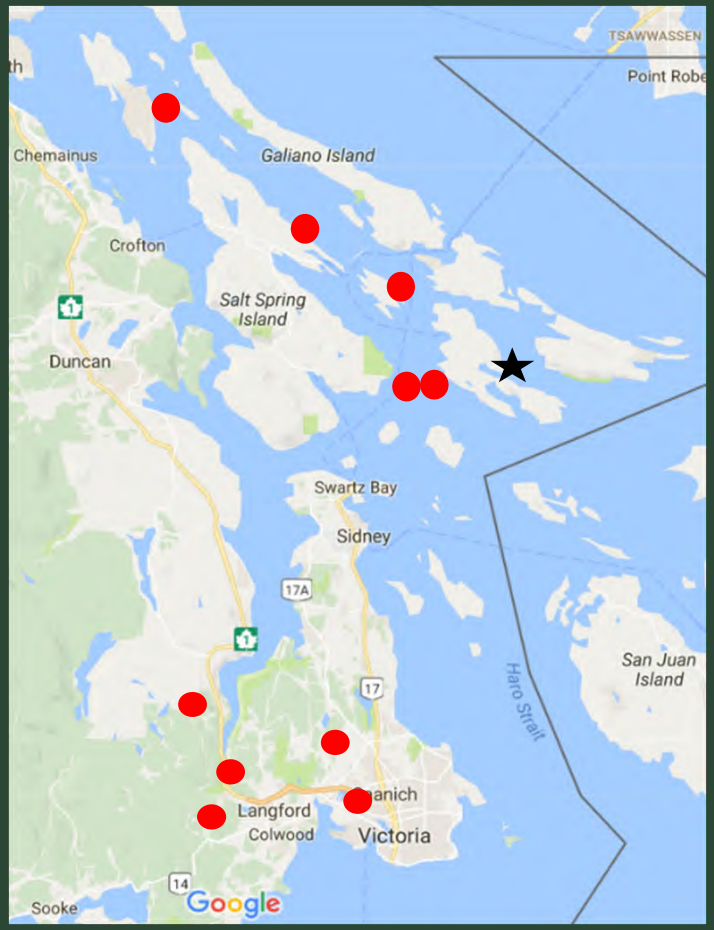


New KEXMIN plants emerging on Sidney Spit

Education / Outreach

- Closure signage and fencing installed around the perimeter of restoration site
- Interpretive panels installed at Sidney Spit, Day Use and Hook Spit
- Interpretive messaging shared in Park Reserve and at several outreach venues

Species at risk recovery in Garry oak ecosystems



Slender Popcornflower

Plagiobothrys tenellus (Threatened)

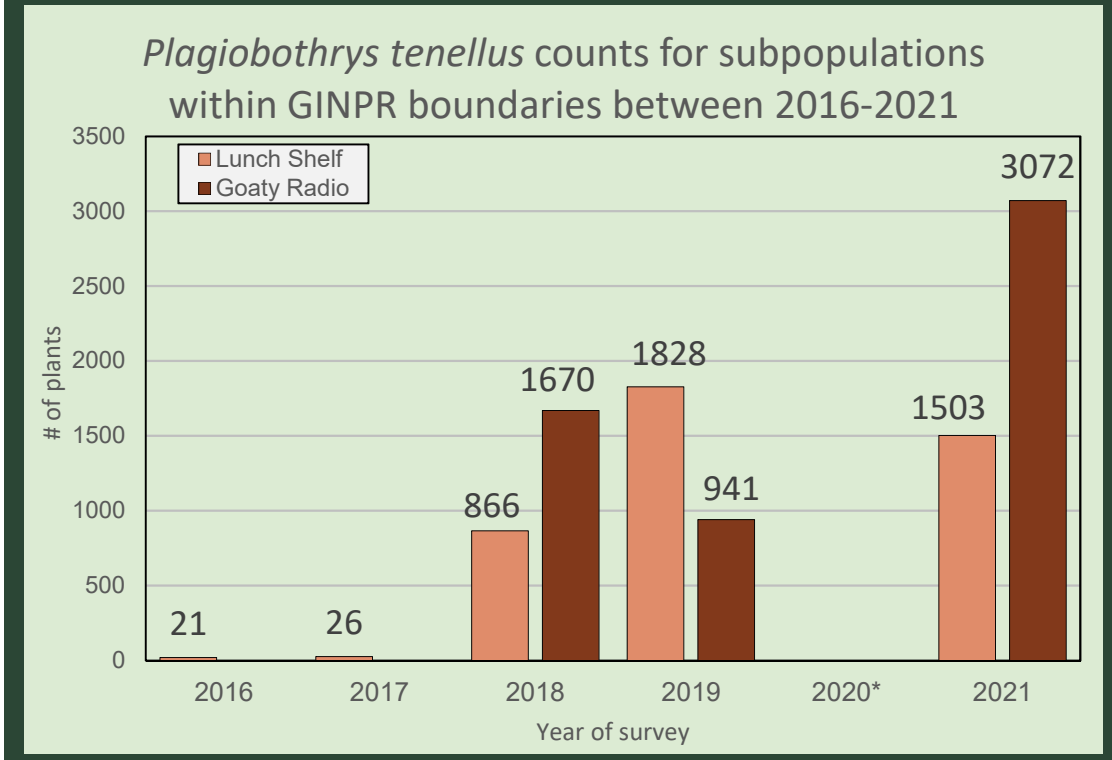
- Winter annual forb
- 1 population recently observed in Canada
- Feral goats likely maintaining habitat on Mount Warburton Pike, Saturna Island

Slender Popcornflower

Plagiobothrys tenellus (Threatened)

Slender Popcornflower

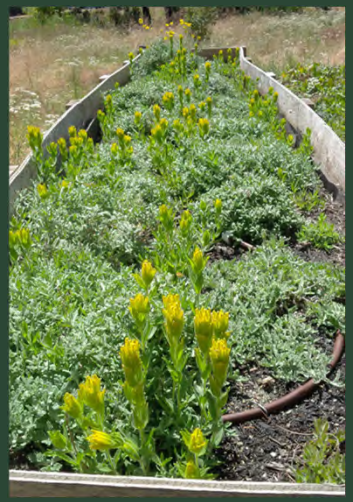
Plagiobothrys tenellus (Threatened)



Golden Paintbrush

Castilleja levisecta (Endangered)

- Failed translocation to Mini D'Arcy Islet
- Tested several translocation methods
  - Plugs, seeds, water + fertilizer addition, co-planting with host plants, prescribed burn plots



Coastal Scouler's Catchfly
Silene scouleri (Endangered)

- Failed translocation to Mini D'Arcy Islet
- Too dry?

Please complete our survey when you leave!

More Questions? Please Contact – Wendy Tyrrell

sar@islandstrust.bc.ca

Thank you!!

Pippi Lawn - seeding endangered Contorted-Pod Evening Primrose

ISLANDS TRUST CONSERVANCY