Restoring Coastal Sand Ecosystems for Species at Risk in Gulf Islands National Park Reserve:
an opportunity for partnerships and collaboration

Introduction

Sidney Spit in Gulf Islands National Park Reserve provides habitat for provincially-listed ecosystems and provincially- and federally-listed wildlife and plant species. Native ecosystems are disappearing and the park reserve's restoration team, led by Pippi Lawn, is executing a restoration project to remove the primary threat: non-native plants. Restoration is expected to benefit all species at risk on the spit, including common nighthawk. Rebecca Tranmer (MSc ER 2017) conducted a study on nighthawk to **(i) document nest-site attributes and nest success** prior to restoration, **(ii) inform future restoration** prescriptions, and **(iii) fill knowledge gaps** related to nighthawk's use of sand spits.

Methods

- Annual nest search
- Measured nest-site attributes at nest sites and at random sites using 1-m^2 plots:
  - % open sand cover
  - % graminoid, forb, and shrub cover
  - % litter (wood and vegetation) cover
  - vegetation height
  - distance to nearest shrub, wood debris
  - distance to open water
  - presence/absence of backing object
- Nighthawk nests: **n=16** (11 in 2016; 5 in 2017)
- Random points: **n=30** (13 in 2016; 17 in 2017)
- Apparent nest success method using egg shells remains and incidental observations
- Wilcoxon rank sum tests and logistic regression used to analyze nest-site data

Study Site

Ecological Stressors

- Non-native plants (Scotch broom, European beachgrass)
- Bryophyte crust
- Large woody debris
- Trampling
- Deer browsing
- Sea level rise

Results

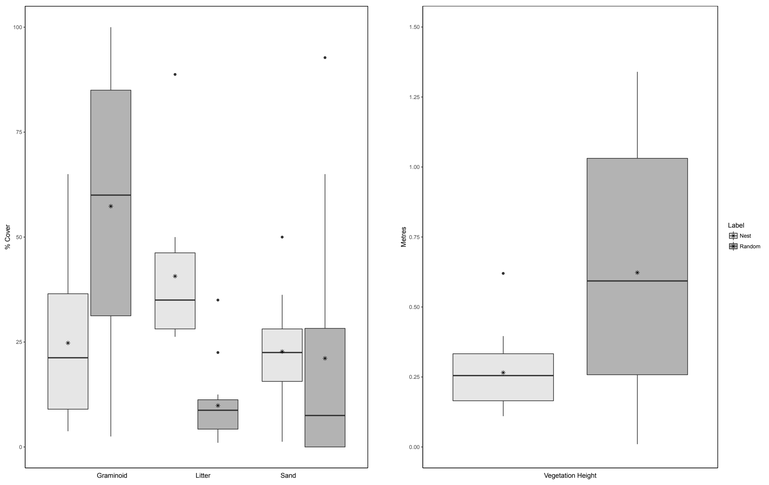

FIGURE 1
Percent cover of graminoids, litter, and exposed sand at nest sites of the Common Nighthawk (light grey, n = 16) and random locations (dark grey, n = 30) at Sidney Spit, GINPR, BC, 2016 and 2017.

FIGURE 2
Vegetation height at nest sites of the Common Nighthawk (light grey, n = 16) and random locations (dark grey, n = 30) at Sidney Spit, GINPR, BC, 2016 and 2017.

Table 6. Apparent nest and egg success of the Common Nighthawk at Sidney Spit, Gulf Islands National Park Reserve, British Columbia, 2016.

	Nest Scale		Egg Scale
No. of nests	11	No. of eggs	22
No. successful nests	9	No. hatched	17
No. infertile/abandoned	2	No. infertile/abandoned	5
Nest success (%)	82	Egg success (%)	77

Table 7. Change in percent cover of Scotch broom between 1946 and 2016 at Sidney Spit, Gulf Islands National Park Reserve, British Columbia.

	1946 to 1975		1975 to 2016		Average rate of change between 1946 and 1975	Average rate of change between 1975 and 2016
	Diff. (ha)	% diff. (ha)	Diff. (ha)	% diff. (ha)		
Scotch broom cover	+0.25	+4.0	+3.5	+54.3	+0.009 ha /year	+0.09 ha/ year

NIGHTHAWK NEST
(R. Tranmer)

FEMALE NIGHTHAWK
(P. Lawn)

Conclusion Highlights

- Litter and graminoid cover are best predictors of nest presence
- Nest success higher in areas with low human disturbance
- Scotch broom increased by 0.09 ha/yr on average 1975 to 2016

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Credits

Rebecca Tranmer, MSc, RPBio, SFU/BCIT and Stantec Consulting Ltd.

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