

Monitoring Streaked Horned Lark Habitat in the Lower Columbia River

Jacob Watts, GISP

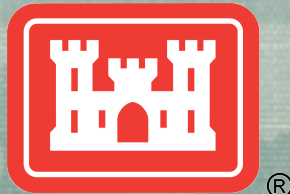
Geographer

Kris Lightner

Environmental Resource Specialist

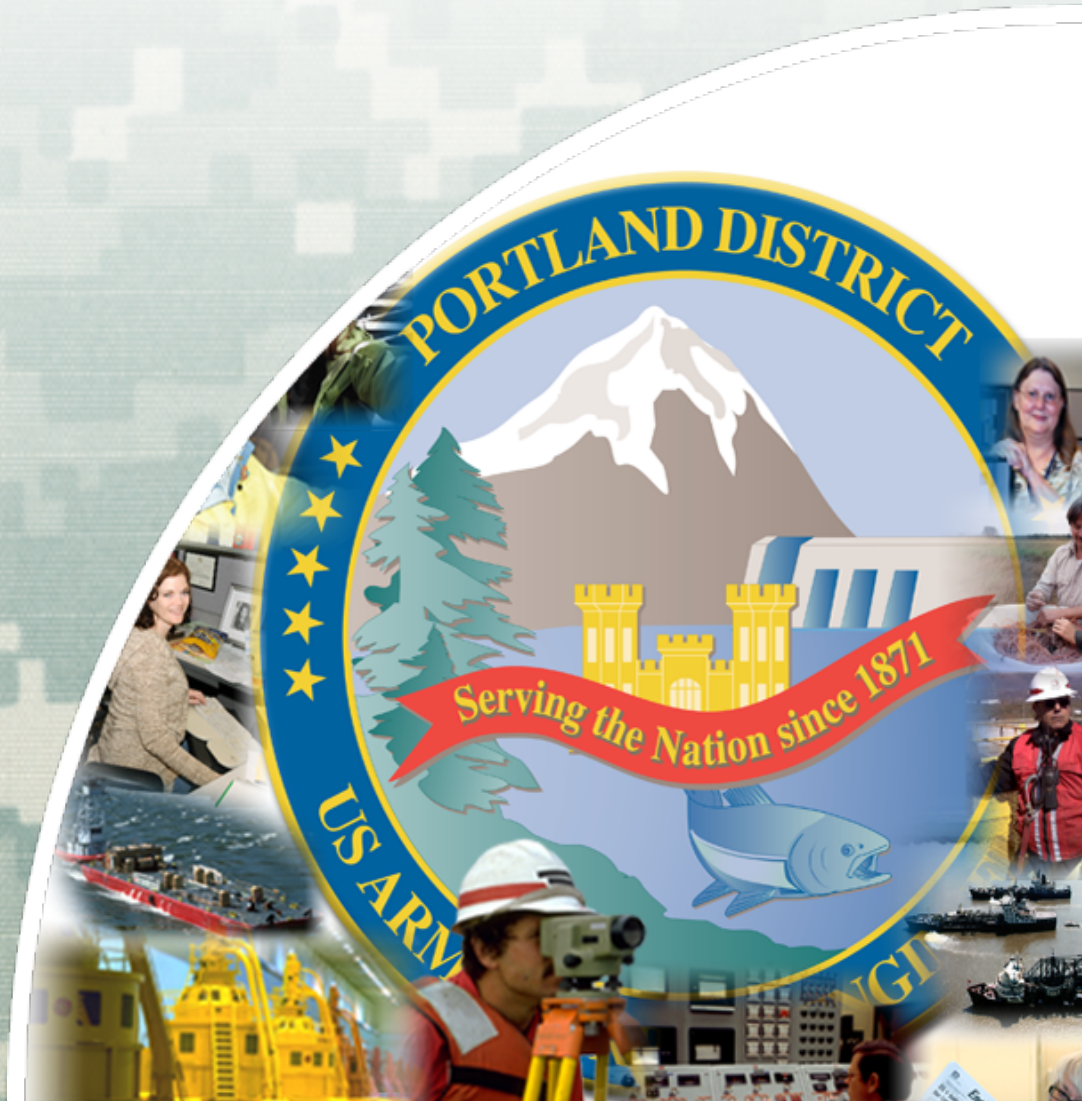
USACE, Portland District

27 October 2015



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Introduction

- Why is the Corps monitoring streaked horned lark habitat?
- Monitoring strategy
- Data requirements
- Analysis and results
- Path forward



Photo courtesy of USFWS



Streaked Horned Larks and Dredging

- Streaked horned larks listed under Endangered Species Act in October 2013
- Larks occupy sites along Columbia River year-round (breeding and non-breeding season)
- Corps' directive to maintain Columbia River navigation channel and placement of dredged materials (sand)
- Five year dredging and placement plan
- Formal consultation resulted in a biological opinion from USFWS requiring Corps to monitor lark habitat

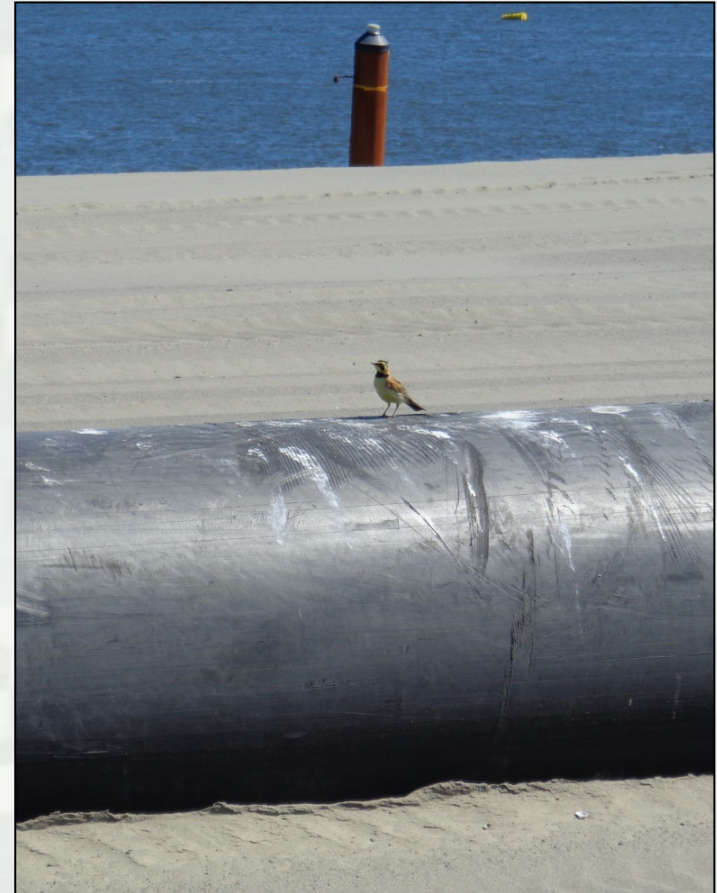
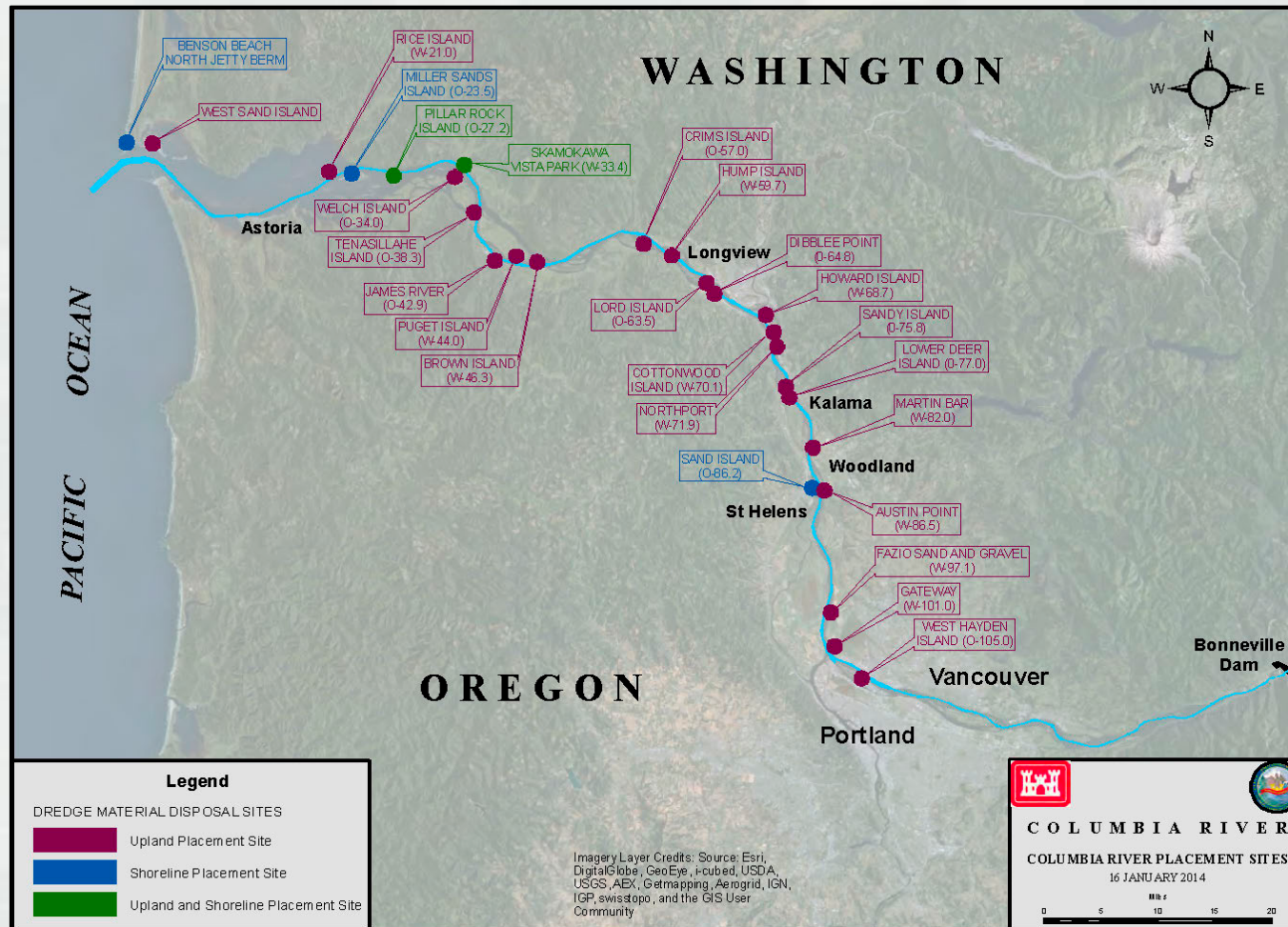


Photo courtesy of Port of Portland



Dredged Material Placement Site Network

- 25 sites, West Hayden Island (RM 105) in Portland downstream to Benson Beach (RM -1.5) on WA shore of Pacific Ocean



Dredged Material Placement



Martin Bar Dredged Material Placement Site, photo courtesy of Port of Portland



Streaked horned lark habitat

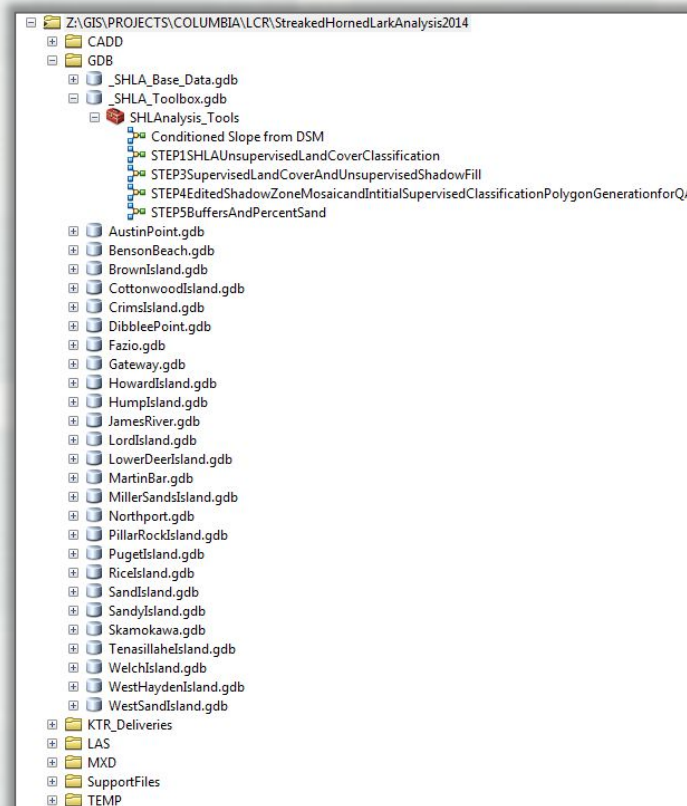


How does lark habitat transition from nesting habitat to freshly placed dredged materials back to suitable nesting habitat?



General Background

- Established (mostly) automated 5 step geoprocessing routine to generate high resolution land cover classification data categorized as Suitable, Unsuitable and Yet-to-be Suitable SHLA habitat dataset for each site.



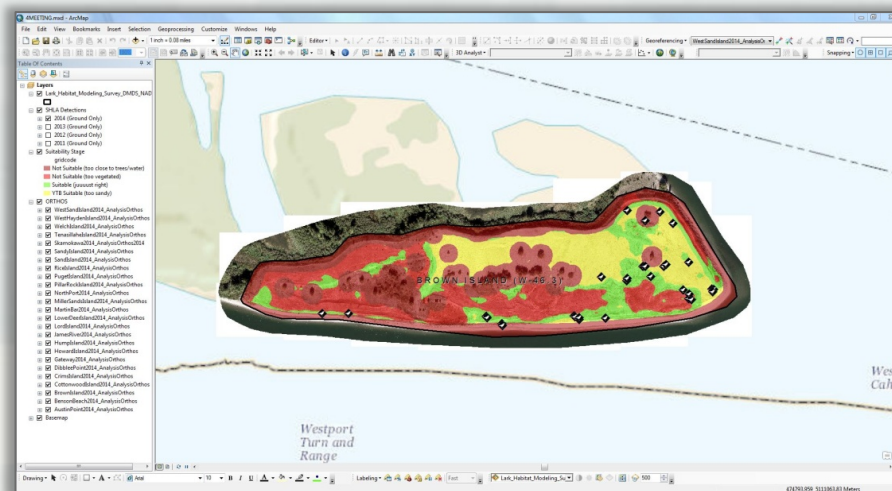
SHLA Habitat Characteristics

■ Land Cover Classification Output

- Suitable SHLA Habitat = 50% - 90% Bare Sand in 25 m Window
 - ❖ Good mix of bare sand and grass
- Unsuitable SHLA Habitat = 0% - 50% Bare Sand in 25 m Window
 - ❖ More grass than sand: good place for dredged materials placement
- Yet-to-be Suitable SHLA Habitat = 90% - 100% Bare Sand in 25 m Window
 - ❖ More bare sand than is suitable: Beginning process of becoming suitable SHLA habitat – 3-4 year cycle generally observed from dumping to suitable habitat

■ Buffer Analysis

- 25 meters from shoreline
- 25 meters from dense vegetation



Data Requirments

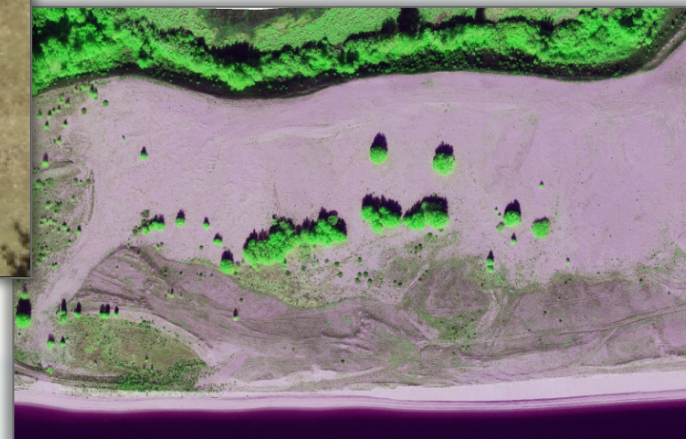
- Acquired high resolution 4-band aerial imagery & high resolution surface elevation data of the sites.
 - 5cm pixel resolution imagery
 - 100 XYZ points per square meter elevation data



Photogrammetrically Derived
3-D Point Cloud
(Brown Island, Columbia R.)



5cm pixel resolution imagery



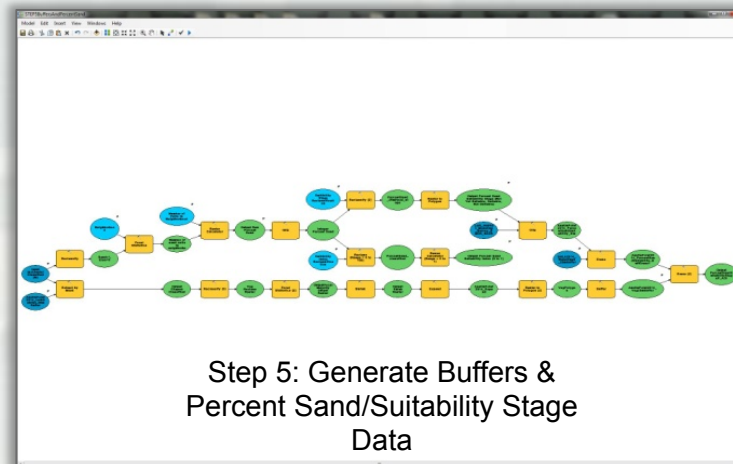
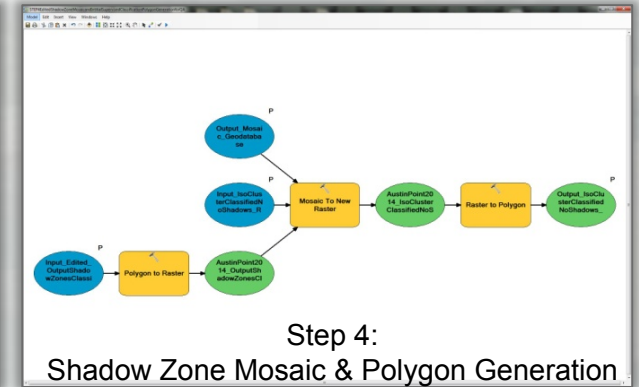
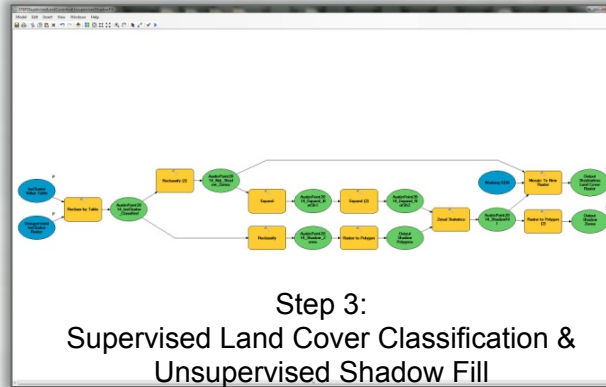
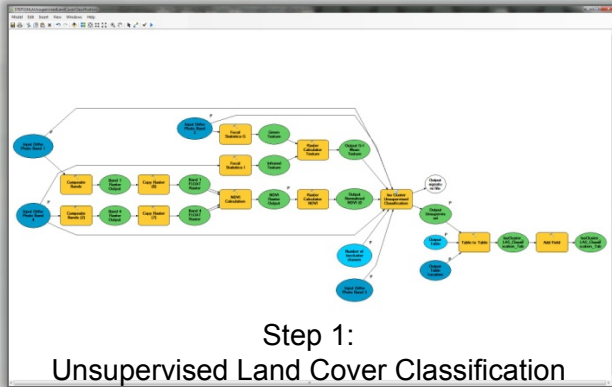
Multi-Spectral Orthophoto
-RGB+NIR-
(Brown Island, Columbia R.)



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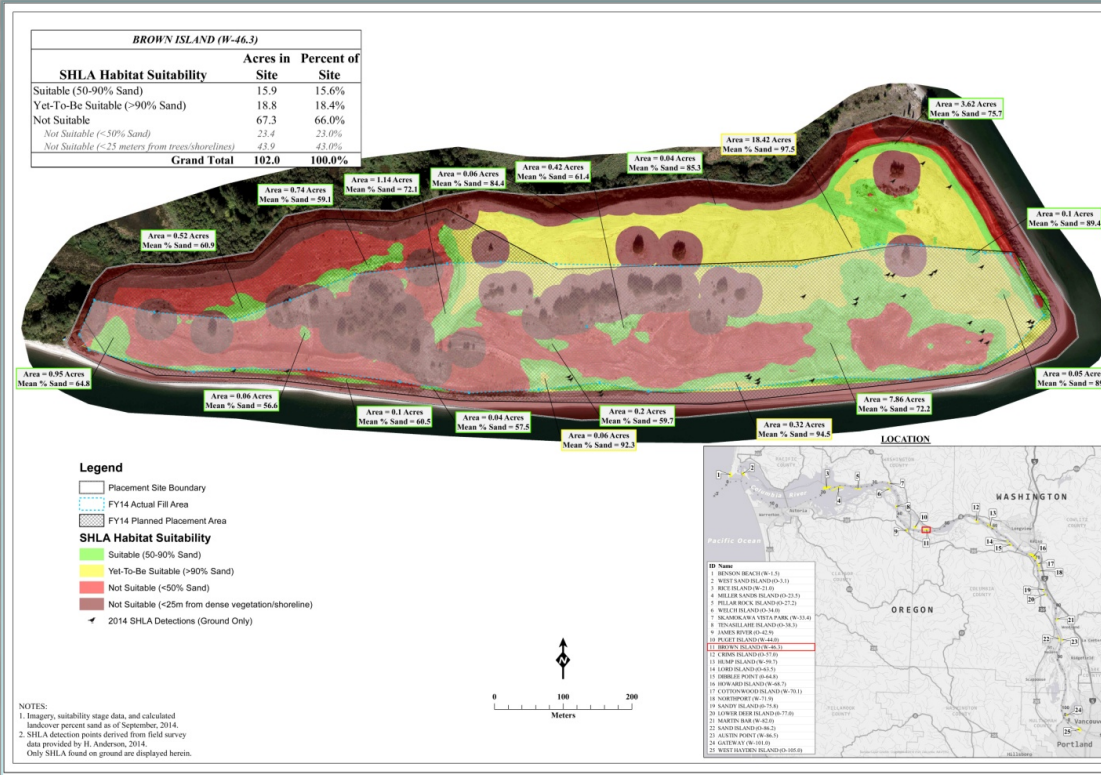
General Background

- Built several customized tools to automate the process and streamline/standardize data production.



Results

- Summarized area of each stage class and its percentage of the AOI are Final Output



❖ Cartographic Output for Every Site

BROWN ISLAND (W-46.3)		
SHLA Habitat Suitability	Acres in Site	Percent of Site
Suitable (50-90% Sand)	15.9	15.6%
Yet-To-Be Suitable (>90% Sand)	18.8	18.4%
Not Suitable	67.3	66.0%
Not Suitable (<50% Sand)	23.4	23.0%
Not Suitable (<25 meters from trees/shorelines)	43.9	43.0%
Grand Total	102.0	100.0%

Site	Total AOI (acres)	Suitable Area (acres)	Yet-to-be Suitable Area (acres)	Not Suitable Area (acres)
Austin Point	29.5	6.4	18.4	4.7
Benson Beach	124.0	0.8	21.8	101.4
Brown Island	102.0	15.9	18.8	67.3
Cottonwood Island	62.0	0.1	0.0	61.9
Crims Island	58.8	15.8	5.4	37.6
Dibblee Point	51.4	11.7	4.6	35.1
Fazio (Not Required)		0.0	0.0	0.0
Gateway	39.7	7.1	24.4	8.2
Howard Island	314.8	4.6	0.3	309.9
Hump Island	64.5	5.0	24.5	35.0
James River	53.0	5.8	4.2	43.1
Lord Island	24.4	10.7	0.1	13.7
Lower Deer Island	24.3	1.2	0.0	23.1
Martin Bar	40.2	11.3	5.0	24.0
Miller Sands	116.4	20.6	24.6	71.3
Northport	30.8	12.1	2.4	16.3
Pillar Rock Island	51.5	3.3	4.0	44.2
Puget Island	98.1	0.0	0.0	98.1
Rice Island	263.7	39.2	148.3	76.2
Sand Island	28.3	1.7	1.0	25.5
Sandy Island	31.8	7.4	11.5	12.9
Skamokawa	15.1	1.3	7.6	6.2
Tenasillahe Island	40.5	8.5	13.2	18.8
Welch Island	40.6	0.6	0.0	40.0
West Hayden Island	116.2	19.9	0.1	96.2
West Sand Island	83.3	1.3	0.1	81.8

❖ Tabular Output



Going Forward

- Replicate analysis annually
- Create Habitat Suitability Index (HSI)
 - Refine existing criteria, metrics
 - Add additional criteria (statistically relevant parameters)
 - ❖ Territory Mapping
- Use findings to inform long term placement plan



Questions?

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Photo courtesy of USFWS

