

Wosnesenski Island Range Survey

July 2014

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The Natural Resources Conservation Service (NRCS) Alaska's State Conservationist Bob Jones was contacted with a request from two Alaska Soil and Water Conservation Districts (Homer and Kodiak) and the US Fish and Wildlife Service Alaska Maritime National Wildlife Refuge Manager (FWS) Steve Delehanty, for a Range Survey to be completed on two federally owned and managed Islands; Chirikof and Wosnesenski. The data will be used as part of an Environmental Impact Study being conducted by the Alaska Maritime National Wildlife Refuge concerning unmanaged cattle on the islands.

This assessment includes the development of several range condition maps that will address all aspects of the island's range condition, and include current year's utilization, apparent trend, and similarity index. These assessments are all standard range measurements used throughout the United States, by Federal Agencies including the USDA - Forest Service, the USDI - Bureau of Land Management as well as the USDA - NRCS. The assessments were ocular due to time

constraints, and the methodologies are all documented in the NRCS's Range and Pasture Handbook.¹

During July 15 through 25, NRCS Rangeland Management Specialist Karin Sonnen and Range Technician Katie Schmidt traveled to both islands via the USFWS Research Vessel Tiglax, to conduct the surveys at each island. This report will focus on Wosnesenski Island.

The crew had two days (July 21 and 22) to assess as much of the island as possible. Weather, including wind direction, speed, and ocean conditions (as well as the terrain around the island and just under the water's surface) dictated where crews could be dropped off. The island is small enough that good coverage of Wosnesenski was achieved in those two days. The crew traveled around on foot for the two day assessment, covering the southern half on the first day and the northern half on the second day.

Wosnesenski Island General Description:

Wosnesenski Island is an approximately 7,500 acre, tree-less island located about 11 miles south of the Alaska Peninsula and 45 miles east of Cold Bay.



The terrain on Wosnesenski varies, but is primarily rolling low ridges in the north with a couple of high elevation, rocky and steep buttes. Alpine communities cover the shoulder ridges at higher elevations in the southern part of the island. The shores of the island are not sandy beaches

with just two exceptions of short stretches in the north eastern part of the island. The two buttes are so steep that cattle cannot access the sides or tops of them, but the southern-most one sits atop a ridge that cattle can and do get over to access the southern-most part of the island.

Elevation for much of the island is below 400 feet, with the buttes reaching a maximum of about 1,400 feet.

The island has six main vegetation communities. The dominant two are a mossy wet sedge meadow and a crowberry lowland community. Additionally a diverse forb community is found in the uplands and an alpine dwarf shrub community in the highest elevation areas of the island. The minimal areas of sandy dunes are covered with Beach Wild Rye, and patches of willow thickets are common throughout the island.

RANGE CONDITIONS (by plant community):

The range conditions of Wosnesenski closely follow the plant communities of the island.

The most heavily impacted community is the Crowberry Lowland community, and the use is dominantly from the hooves of the cattle. The cattle are using trails consistently on this island, and are especially using this plant community to travel through. The underlying soil of this plant community is well drained and firm, thus has good footing for them to walk on. The bulls are pawing and creating rutting pits in these areas, resulting in large polygons of exposed soil. The average amount of exposed soil was ocularly estimated to be between 10 and 15% of the site, and up to 25% in some areas.



Crowberry Lowland site (top right) and effects of pawing on the Crowberry Lowland sites (right). The exposed soil from the cattle pawing in this site is about 10 to 15% of the site's area.

The mossy, Wet Meadow sites showed very little forage use, but some trailing was evident. The cattle have established certain trails through these areas, and do not look like they are venturing off them very much, probably due to poor footing when the ground is not frozen (the cattle would certainly sink down into the peat, and could even become bogged down in areas). The vegetation was for the most part ungrazed, as of July 21. It is expected that the animals do make more use of these areas when the ground is frozen and the unstable footing is not an issue.



Lichen Wet Meadow (above) is a common site of Vosnesenski. Diverse Herb Meadow (below) is one of the more productive sites for cattle grazing and forage production.



The Upland Diverse Meadow sites did show very light use, and had some trailing through them, but overall the plants looked vigorous with the ground well covered. The plant community has probably shifted to one more tolerant of grazing, with the vegetation shorter and having a higher

percentage of grasses.



The Alpine community had some cattle use, with exposed soil and trailing in saddles from traveling over the ridge between the northern and southern parts of the island. Their concentrated walking has caused some severe erosion along certain areas of the trails close to the ridgeline, where it is likely that snowmelt and rainfall as well as wind are causing

Typical Alpine community (above) composed primarily of dwarf shrubs, moss, lichens, and small forbs. This site is fragile and susceptible to the effects of hooves when cattle congregate, as seen in the photo (below). This area is at the ridgetop where the cattle have developed a trail from one side of the ridge to the other. Photo at right- The roots and branches of this willow show where the soil once covered but has since been eroded away.



significant erosion along the trails.

The largest of these gullies has areas that are 3.5 to 4 feet deep and 10 feet wide. The vegetation in higher elevation areas is more fragile and susceptible to hoof action, but the cattle do not appear to be spending much time in these areas.



The Beach Dune and Ridges areas showed very little grazing of the existing vegetation, but did have some areas of exposed and eroding sand, showing the results of past heavy grazing and the resulting plant community that has developed.

In one area the dunes have been exposed in the past and caused sand to be blown toward the interior of the island, into the large lake in the



Beach Wild Rye growing on the sandy dunes are ungrazed as of July 21 (photo above). Some of the dunes and their vegetation is intact, and some have the scars of over-grazing and shifting sands resulting from the removal of their vegetation (photo below).



north-eastern section of the island. The moving sand has smothered the vegetation in front of it (toward the interior island and the lake), causing more area to be covered with exposed sand. Some pioneering and hardy species remain, including horsetail (*Equisetum arvense*), and are increasing, working to cover these exposed areas. It appears that the cattle

population was higher and has dropped a significant amount in the last 5 years or so. It is likely

the cattle will use these areas more heavily in the winter to have access to the beach and any kelp that might wash up on the shores.



The thickets of willow are dense and difficult to walk through, and the cattle don't appear to be using them during the summer months. They may browse on them during the winter, but in July the plants looked vigorous and healthy.

Willow thickets prove to be difficult for cattle and humans to walk through on Wosnesenski (above). Cattle trailing over the saddles of the main ridge on Wosnesenski has allowed for erosion to create this gully on the south side of the ridge (below).

Additional cattle impacts:

As the cattle move across the island they appear to be using the trails consistently. This is likely due to the poor footing of the mossy sedge meadows and the difficulty of walking through the shrub thickets. In a few areas where the trails crossed a stream, the banks on either side had been trampled, but those areas are limited due to the consistent trail use.

The current grazing pressure on the plants was well within prescribed grazing standards, and the majority of the cattle impacts were cumulative and made with hooves. The forage present is not being overgrazed as of 2014, but the unmanaged grazing is allowing for the impacts of hooves to take a toll on the island's



vegetation communities which are susceptible to erosion. These communities include the Crowberry Lowland sites, the Beach Dunes and Ridges, and the Alpine sites.

Cattle and Range of Wosnesenski

Good winter range on islands in the Aleutian Chain would have several desirable characteristics. One would be high grass production. Another would be accessibility by the cattle, which would include gentle slopes and low elevation so as not to be covered by deep snow for long stretches of time. Wosnesenski does not have many ecological sites that have high grass production (more than 2,000 pounds per acre). The highest producing forage sites on the island are the Beach Dunes and Ridges sites, which produce approximately 5,500 pounds per acre. The Beach Dunes and Ridges are limited in size, however. The Upland Diverse Meadow sites certainly will provide some winter forage also, as will the Wet Meadow sites, which are likely used more in the winter when the ground is frozen and footing is better. Overall, the limiting factor for the number of cattle on Wosnesenski Island is the available winter forage.

The population probably fluxuates from year to year, and is kept at a somewhat low number, for a few reasons. Some of the cattle are believed to be harvested each year by the people living in Sand Point. More influential, however is that the island does not have a lot of high producing range sites that could be used in the winter months. Based on the range conditions and plant communities present on the island, it appears that the cattle population was considerably higher in the last 10 to 15 years, and has dropped since then.

The cattle count done on foot by USFWS employees while we were on the island resulted in 110 animals, and an aerial count done later in the summer resulted in a count of 124 animals.

Option for including cattle:

The carrying capacity for the island is based on the production of the different ecological sites, and their current condition and production rates. Acreages of each and their winter accessibility were factors used to determine the forage available to the cattle through the winter. The total production of each ecological site was estimated and fifty percent of the annual production was used as available to the cattle without exceeding prescribed grazing standards.

Using these parameters, an initial stocking rate of 150 head of cattle is a number that will allow the range to recover. This also assumes a bull to cow ratio of 1:20.

The initial stocking rate recommendation was calculated based on the vegetation available in the winter months. However if the cattle population continues to have a high percentage of bulls, the erosion and exposed soil that is occurring (to create rutting pits- done by the bulls) will continue. A bull to cow ratio close to 1 to 20 would be optimal for both the cattle and the range. The trailing through the alpine areas along the ridgeline where concentrated erosion is occurring may continue to occur regardless of the number of cattle on the island.



Shifting sands from the exposed dunes have made their way inland and into the large lake in the north-eastern corner of the island (above).

It is not recommended to keep any more cattle on this island than is necessary for the local people to have a sustainable harvest. The number of animals harvested each year is unknown, but assumed that the herd number needed to sustain the harvest is less than the initial stocking rate that the forage will support. Using this lower herd number will provide the cattle needed, while allowing the range to recover and improve sooner. If at a later date it is determined that more cattle are needed, the range will be healthy and able to support a larger herd. For example, a balanced herd of 50 would easily provide 20 cattle for harvest each year and replacement heifers and bulls to be incorporated into the herd for sustainability.

Future Monitoring

Photo points were set up on the north eastern parts of the island where the beach dunes and ridges have been impacted. These sites have relatively easy access and can be periodically monitored to watch for changes over time. These photo points are described in detail and attached to the end of this report, so they can be revisited when other trips are planned to Wosnesenski in future years.

References:

1. National Range and Pasture Handbook. 1997 Natural Resources Conservation Service Grazing Lands Technology Institute (GLTI), Fort Worth, Texas.

Wosnesenski Island Initial Stocking Rate Calculation

Ecosite	Acres	Forage	# Forage Avail/ac	Total # forage avail	Number of animals
Alpine Dwarf Shrub	570	n/a	0	0	
Beach Dunes and Ridges (poor)	146	1500	0	0	0.0
Beach Dunes and Ridges	147	5000	2500	367,500	32.9
Crowberry Lowland	1481	n/a	0	0	0.0
Diverse Herbaceous Meadow	448	1800	900	403,200	36.1
Lichen Wet Meadow	1643	900	300	492,900	44.2
Coastal Slopes/Vegetated Cliffs	497	n/a	0	0	0.0
Sedge Drainage	283	1700	510	144,330	12.9
Shrub Drainage	424	n/a	0	0	0.0
Steep Rocky Upland	250	n/a	0	0	0.0
Water	526	n/a	0	0	0.0
Wet Meadow	467	1700	510	238,170	21.3
Willow Shrub	933	n/a	0	0	0.0
				Total 1,000# animals:	147.5
Totals	7815		4720	1,646,100	

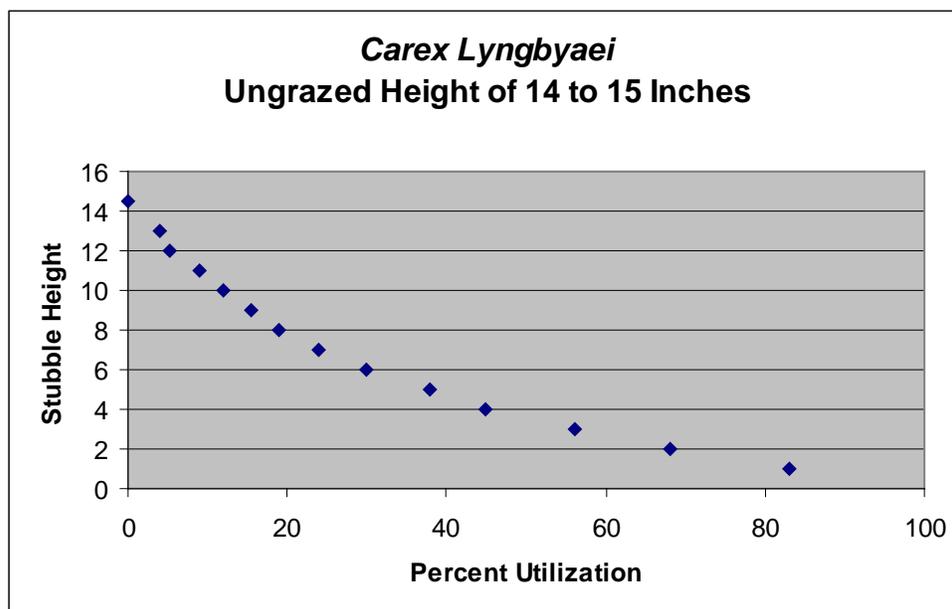
140 cows, 10 bulls - 150 animals in a balanced herd

The island produces, on average, 3,200,000 pounds of forage per year. Following the take half and leave half for the grasses and the take 30% leave 70% for the sedges, that means a forage amount available of 1,600,000 for the cattle to consume. Using the average weight of 1,000 pounds per head of cattle and 3% of their body weight consumed per day, the herd of approximately 125 would consume 116,250 pounds of forage per month. That extrapolates to 1,395,000 pounds of forage per year, which is within the amount of forage allotted. Using these calculations, the island of Wosnesenski could support approximately 150 head of cattle. This is an initial stocking rate, and may need to be adjusted based on management and on the ground monitoring.

Utilization:

Utilization is a measure of how much of the plant's current year's growth has been removed by the grazing animal. This includes not only the amount consumed, but also damage to plants from trampling and hoof action as well. This is an ocular estimation made by an experienced range conservationist.

The following graph shows the utilization curve of *Carex lyngbyaei*, as sampled at the head of Kachemak Bay in Homer, Alaska. This example shows that the utilization percentage is not a direct reflectance of the stubble height of the remaining grass. Grasses have more of their biomass at the base of the plant than at the tips. Therefore, when a plant is grazed to 50% of its height, it does not equal 50% of the plant's biomass removed.



Apparent Trend:

The apparent trend determination looks at the entire site as a whole and compares it to the ungrazed site, or the desired plant community. Plant decadence, soil condition, species composition of the plant community, and vigor of the plants are all considered. A rating is assigned of "positive" for moving in a direction toward the desired plant community, "negative" for moving away from the desired plant community, or "not apparent" for a trend which is not discernable.

Similarity Index:

This is a rating of how similar the existing site is to what would be present without grazing (or the desired plant community, which may be different from the climax plant community). This takes into account not only the species present that would also be in the desired plant community, but also the production of these species. For example, if the site without grazing would be expected to have the following:

Beach Wild Rye 4,000 #/ac
Beach Pea 500#/ac

But the plant community on the site actually had the following:

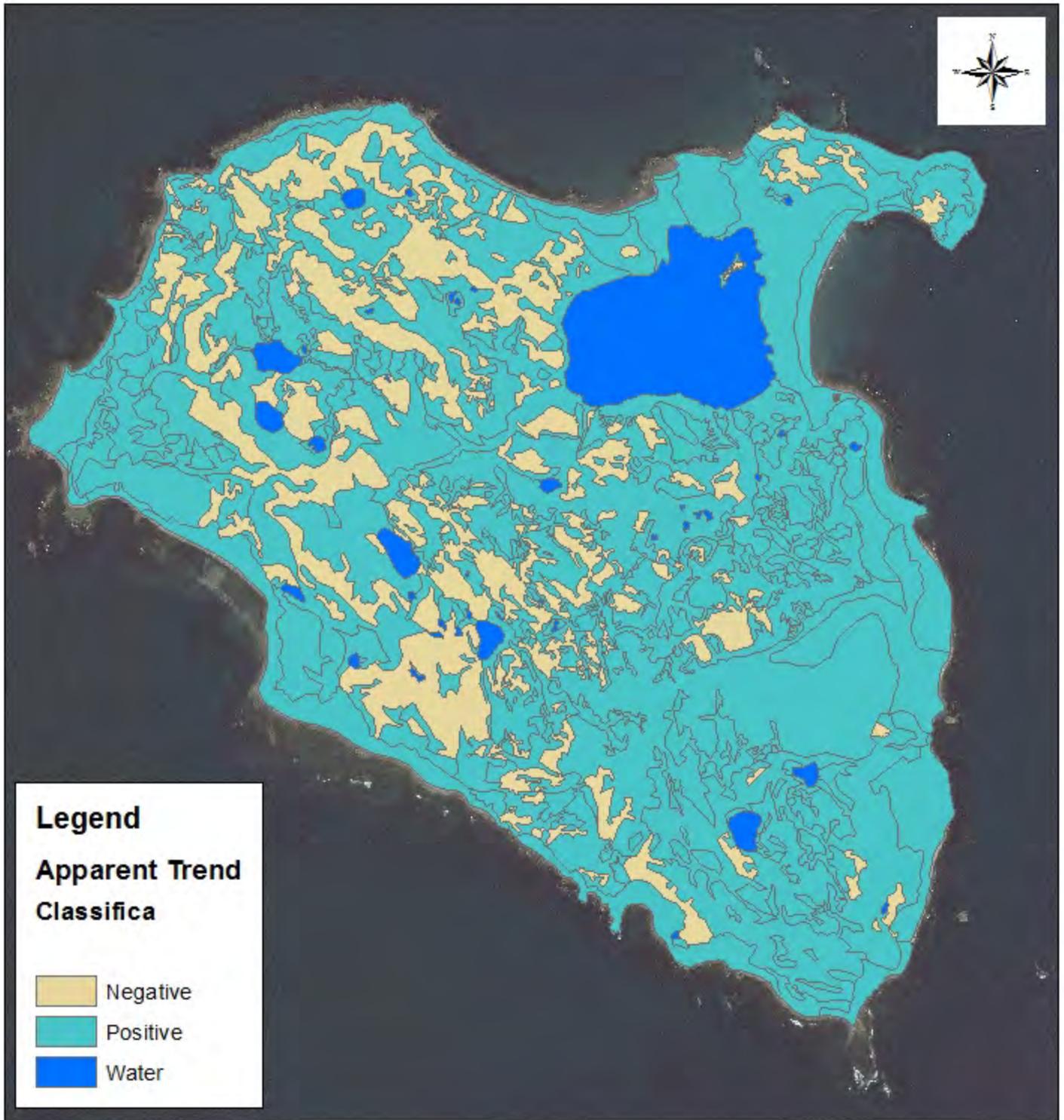
Beach Wild Rye 1,000 #/ac
Beach Pea 100 #/ac
Yarrow 600 #/ac

The Similarity Index would be calculated as follows:

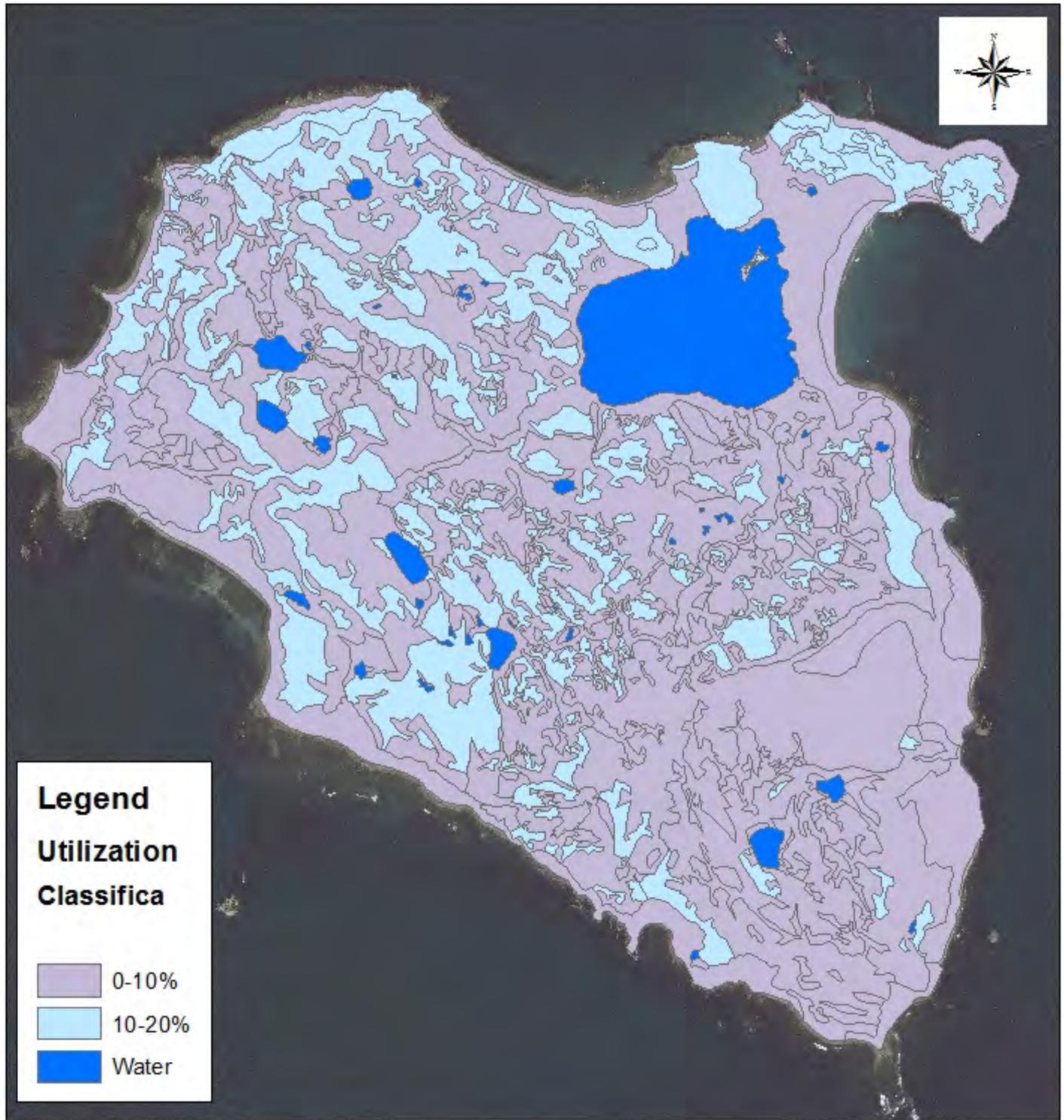
<u>Species</u>	<u>#/Ac expected</u>	<u>#/ac actual</u>
Wild Rye	4000	1000
Yarrow	0	600 (doesn't count toward total)
Beach Pea	500	100
Sum	4,500	1,100

1,100 actual / 4,500 expected = 0.24 or 24% Similarity Index

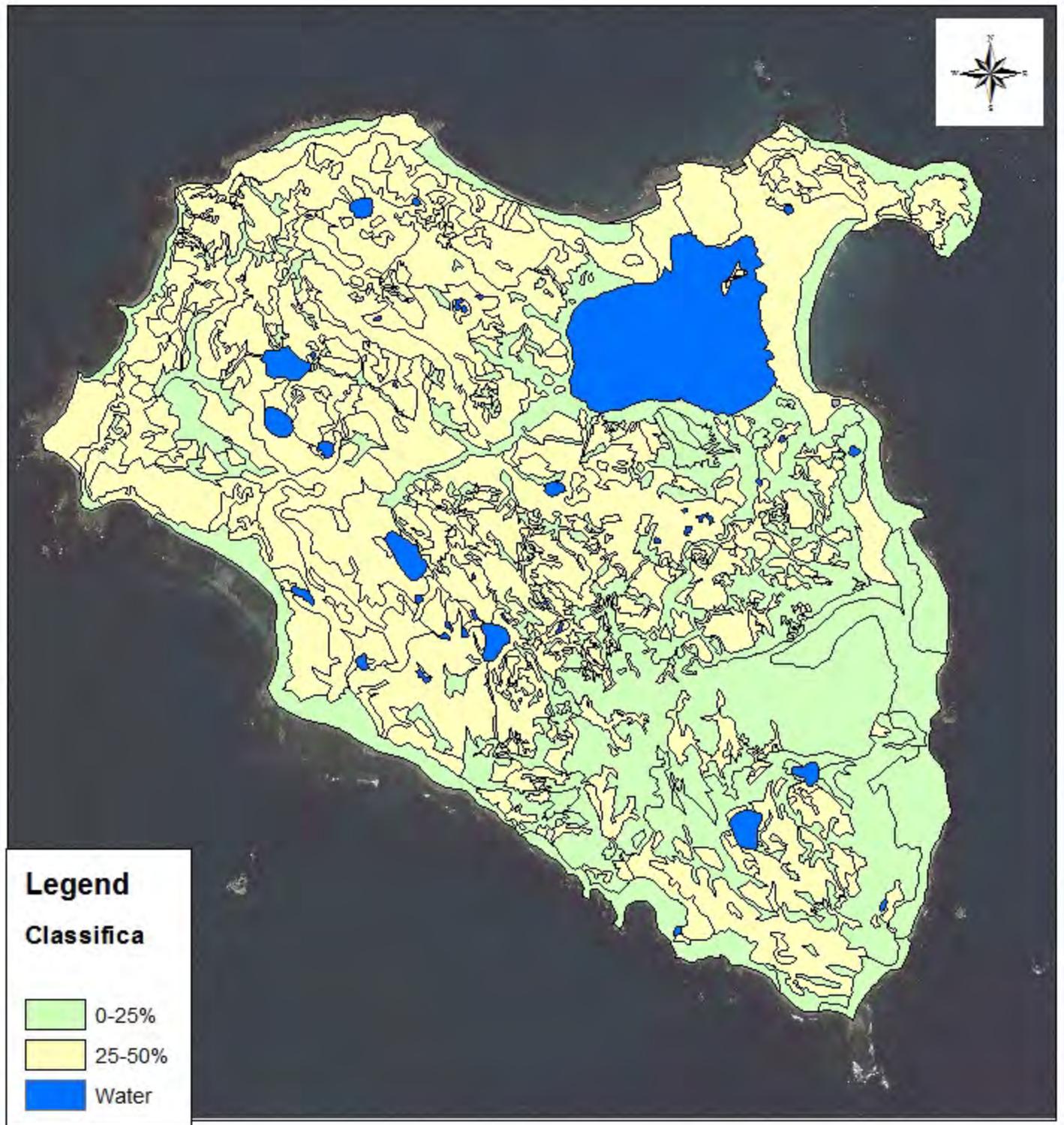
Wosnesenski Island Apparent Trend July, 2014



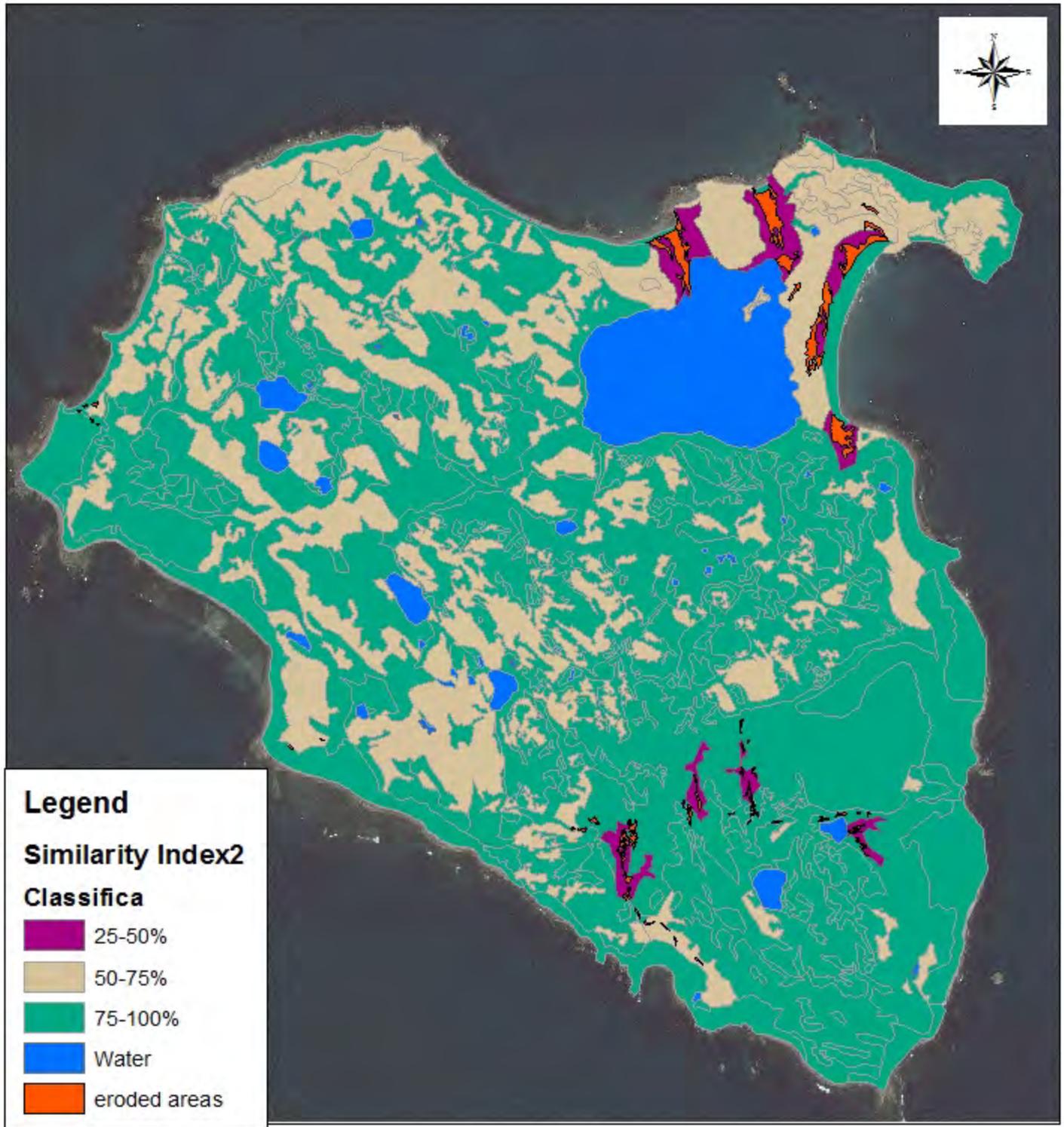
Wosnesenski Island Current Year's Utilization July, 2014



Wosnesenski Island Expected Late Winter Utilization (Before Green-Up) 2015



Wosnesenski Island Similarity Index July, 2014



Wosnesenski Photo Points



Photo Point # 1 Island: Wosnesenski Date: 21 July 2014

Datum WGS 84

N 55 degrees 12.977 minutes

W 161 degrees 21.333 minutes

Observers: K. Sonnen / K. Schmidt

General Location Description: On the top of a dune which is surrounded by bare sand, overlooking the lake and the two buttes of the island.

Veg Description: Sparse Elymus Mollis, Erigeron peregrinis, Camerion angustifolium, Lathyrus maritimus, Solidago sp., Achillea millefolium, Equisetum arvense, Angelica lucida.

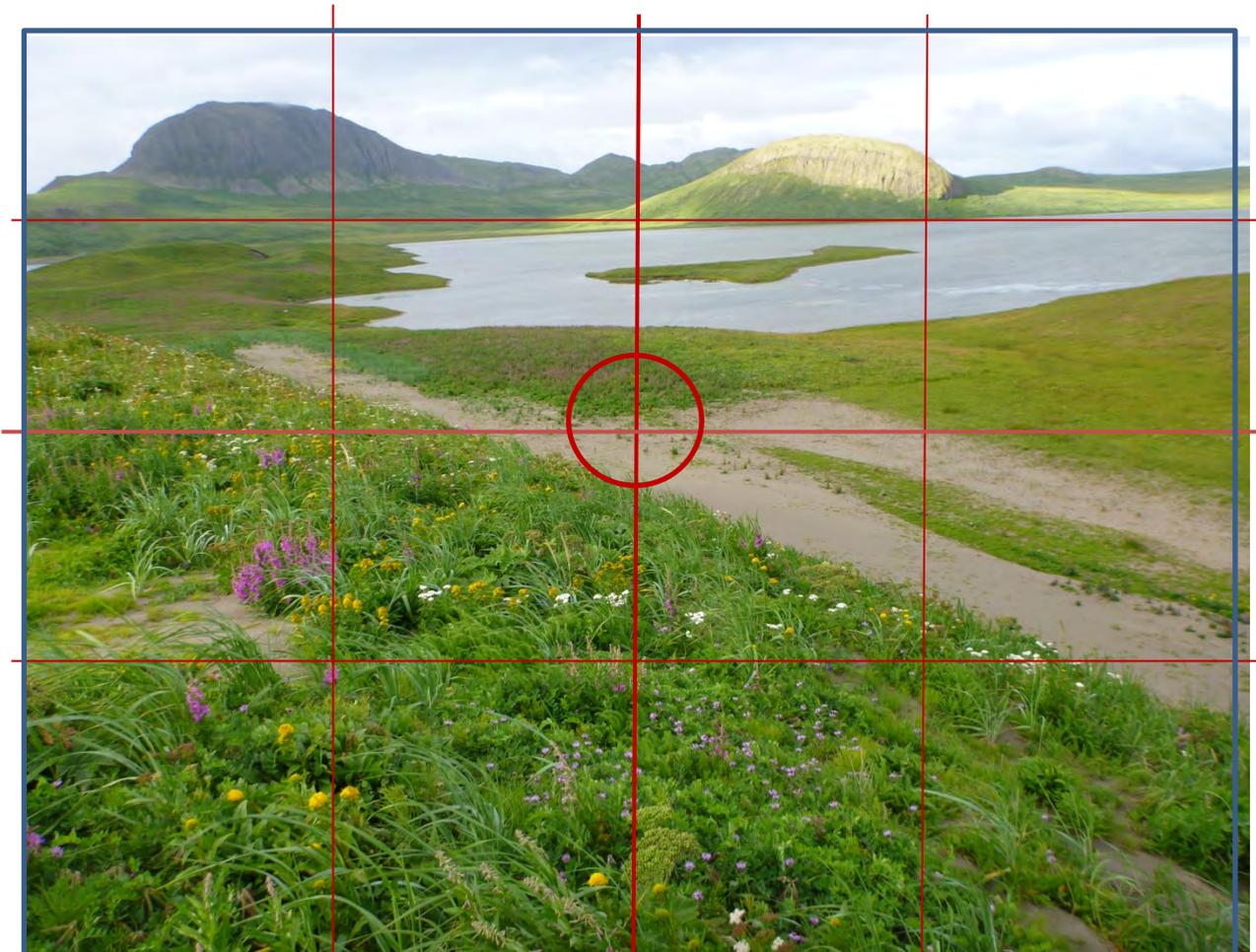
Stressed plant community with exposed sand composing 30-40% of the ground. First photo taken in 2006 by Steve Ebbert. This photo point was formally established in 2014.



The Photo is taken looking : S

Correlates with another photo point taken in an earlier year? Y year: 2006

Photo Aim



This is a photograph taken in early spring, and vegetation quality and amounts cannot be equitably compared to mid- summer growing season photos. However, overall trends of exposed soil can be compared for large changes.



July 21, 2014



Photo Point # 2 Island: Wosnesenski Date: 21 July 2014

Datum WGS 84

N 55 degrees 12.964 minutes

W 161 degrees 21.9463 minutes

Observers: K. Sonnen / K. Schmidt

General Location Description: On a hillside, east of the stream that goes from North beach to the large lake.

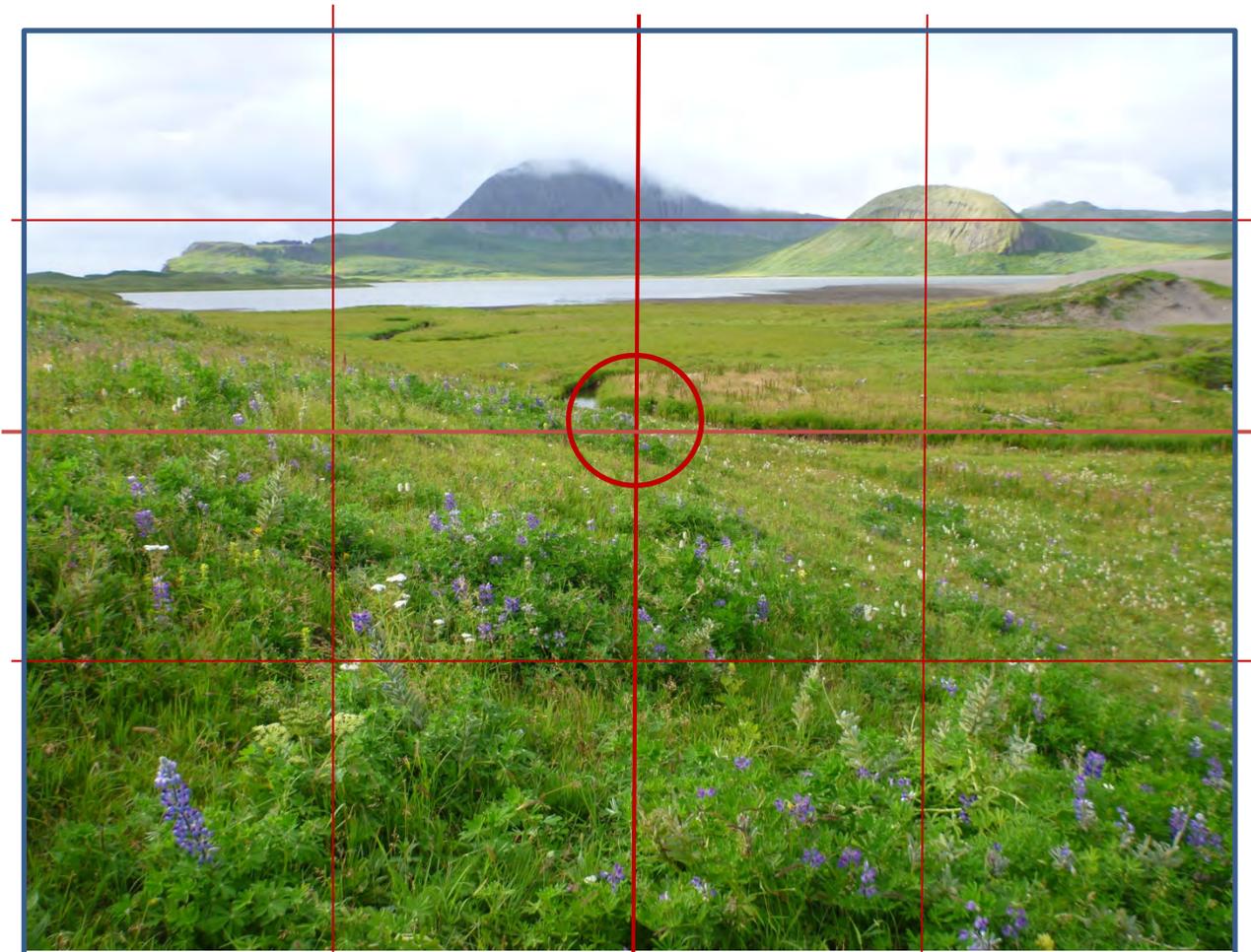
Veg Description: Lupinus nootkatensis, Sanguisorba Canadensis, Camerion angustifolium, Poa sp., Hordeum brachyantherum, Solidago sp., Achillea millefolium, Casteleja, Rhyantes minor. First photo taken in 2006 by Steve Ebbert. This photo point was formally established in 2014.



The Photo is taken looking : SE

Correlates with another photo point taken in an earlier year? Y year: 2006

Photo Aim



This is a photograph taken in early spring, and vegetation quality and amounts cannot be equitably compared to mid- summer growing season photos. However, overall trends of exposed soil can be compared for large changes.

May 15, 2006



July 21, 2014



Photo Point # 3 Island: Wosnesenski Date: 21 July 2014

Datum WGS 84

N 55 degrees 13.012 minutes

W 161 degrees 21.978 minutes

Observers: K. Sonnen / K. Schmidt

General Location Description: At the remains of the old ranch house site near North Beach.

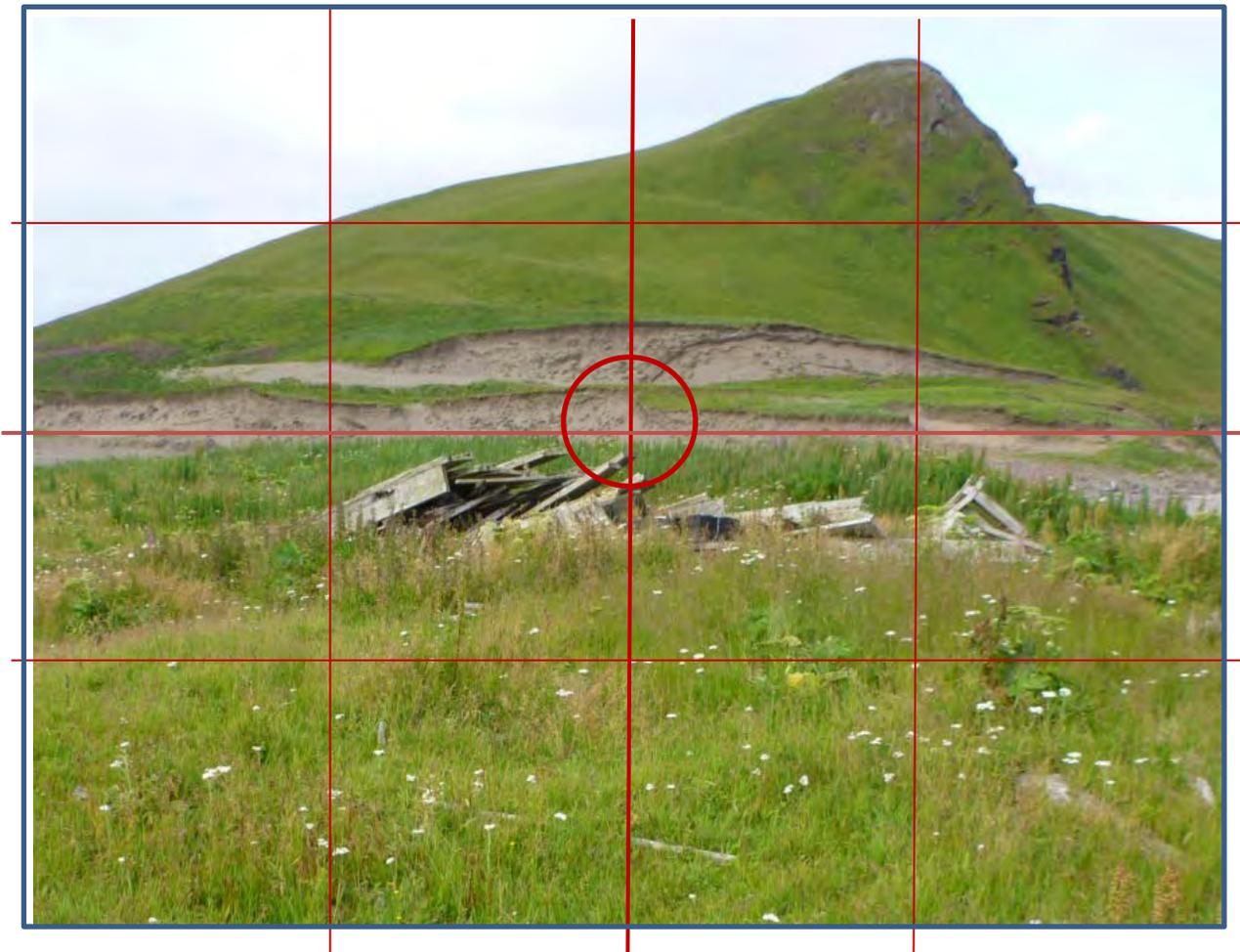
Veg Description: Poa sp., Festuca sp., Achillea millefolium, Plantago sp., Stellaria sp., Geum macrophyllum. First photo taken in 2006 by Steve Ebbert. This photo point was formally established in 2014.



The Photo is taken looking : W

Correlates with another photo point taken in an earlier year? Y year: 2006

Photo Aim



May 15, 2006



This is a photograph taken in early spring, and vegetation quality and amounts cannot be equitably compared to mid-summer growing season photos. However, overall trends of exposed soil can be compared for large changes.

July 21, 2014

