

Revisiting the Arctic National Wildlife Refuge – PRISM surveys 15 years later



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Importance of the 1002 Area of the ANWR

- Provides important habitat for thousands of nesting and migrating shorebirds
- Area is threatened by climate change and development
 - Climate change models and recent studies show drying of tundra
 - Recent legislation opened the area to oil and gas development



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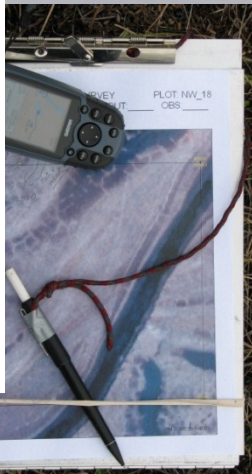
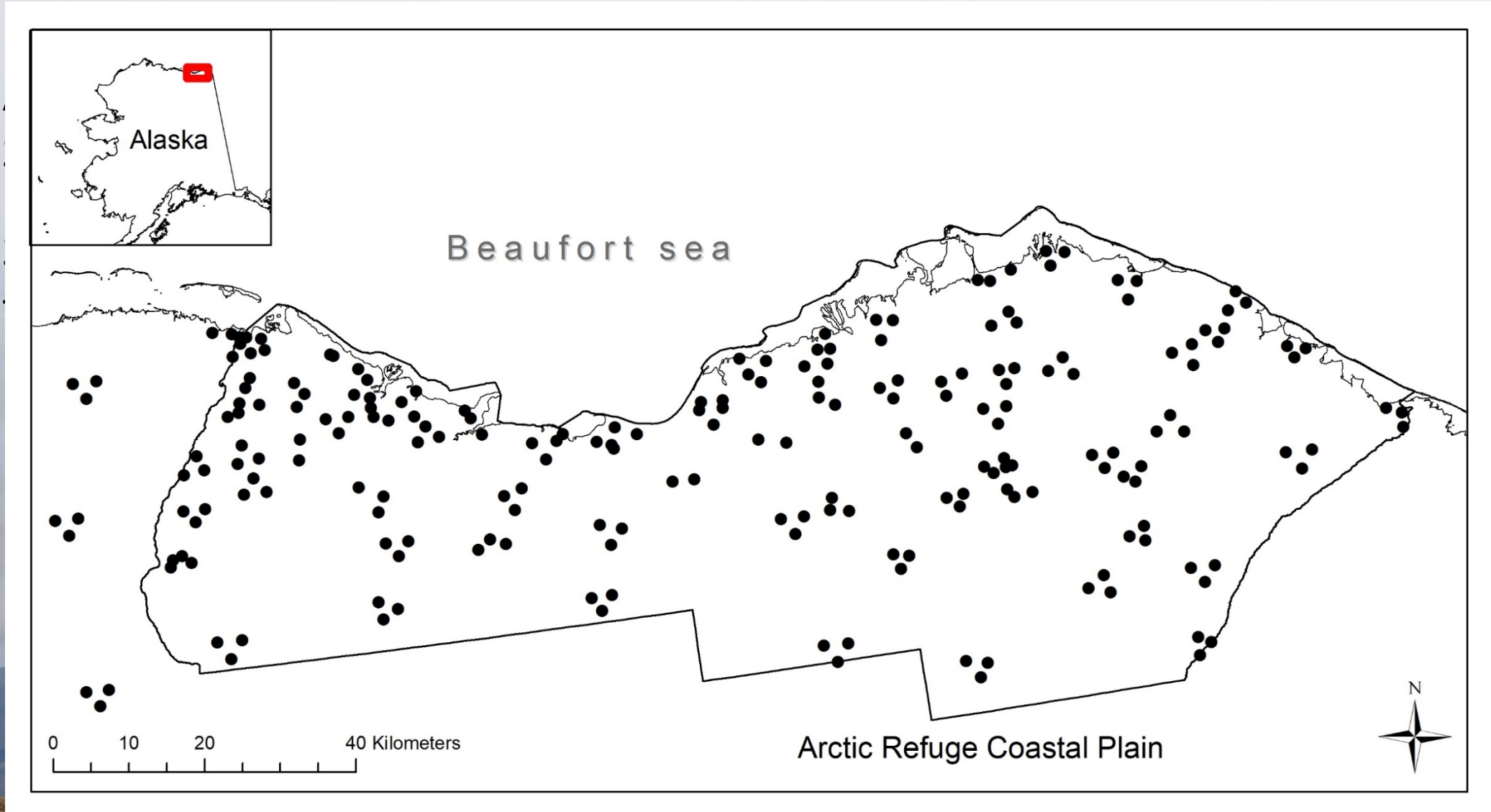


Previous surveys

- In 2002 and 2004, 197 plots were surveyed in the 1002 Area of the Arctic NWR as part of the Program for Regional and International Shorebird Monitoring (PRISM)
- Shorebirds were surveyed using a single-visit, rapid area search technique to estimate the number of breeding pairs



Previous surveys



Current study objectives

PRISM surveys within this region provide:

- First repeat assessment of shorebird population trends using PRISM
- Information for range-wide population and trend estimates
- Information on current distribution and habitat use prior to any proposed oil and gas development



Methods

- Selected plots using a spatially balanced stratified random sampling approach
 - Allocated plots to 4 habitat strata (wetland, moist, riparian, upland) based on previous densities and variances, but adjusted to include additional upland and riparian plots
 - Restricted to federally owned lands
 - Re-surveyed a portion of plots sampled in 2002 and 2004



Methods

- Helicopter-based surveys were conducted from 6 – 16 June 2019
- Each plot was surveyed by one observer for 1 hr 36 min
- Surveyors recorded all shorebirds and their behaviors to estimate the number of breeding pairs on a plot



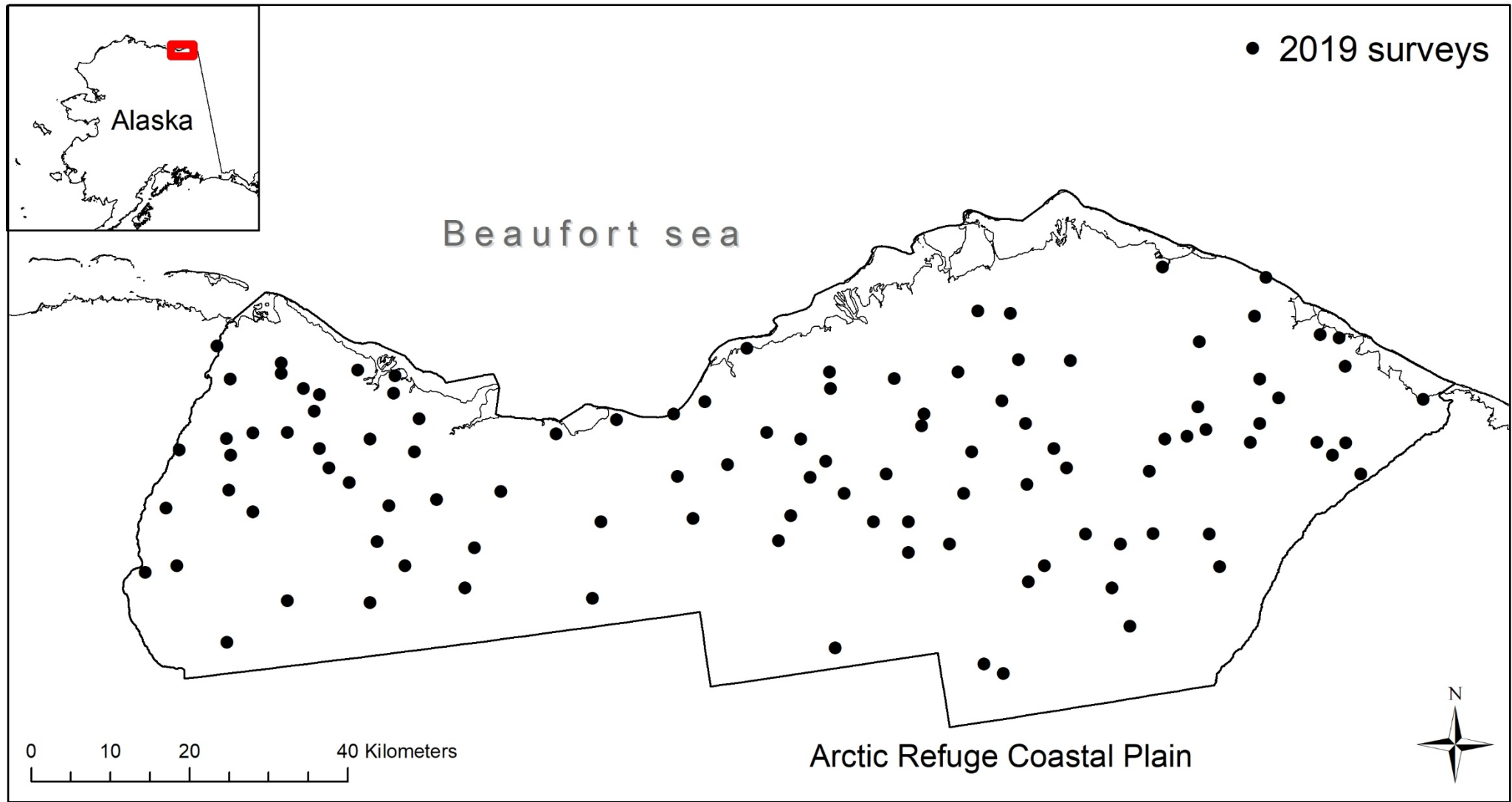
Results

- Surveyed 108 plots, 54 of which were previously surveyed



Results

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- Most numerous species:
 - Pectoral Sandpiper (37%)
 - Semipalmated Sandpiper (21%)
 - Red-necked Phalarope (16%)
 - American Golden-Plover (11%)

Population trends

species	2002/04	2019	diff
pesa	52,978	72,625	19,647
sepl	3,208	4,340	1,132
wisn	0	1,687	1,687



Population trends

species	2002/04	2019	diff
pesa	52,978	72,625	19,647
sepl	3,208	4,340	1,132
wisn	0	1,687	1,687
dunl	10,506	1,229	-9,277
sesa	49,698	32,363	-17,335
lbdo	6,848	819	-6,029
reph	23,226	410	-22,816
rnph	42,762	19,764	-22,998
amgp	15,686	14,635	-1,051
bbsa	7,684	4,492	-3,192
rutu	2,984	1,684	-1,300
stsa	6,218	5,374	-844
whim	4598	0	-4,598
wesa	252	0	-252
basa	3,312	0	-3,312
Total	229,960	159,422	-70,538



Re-surveyed plots (n = 54)

species	2002/04	2019	diff
pesa	44	63	19
sepl	5	8	3
wisn	0	1	1
sesa	35	42	7
stsa	10	11	1
bbsa	8	8	0



Re-surveyed plots (n = 54)



species	2002/04	2019	diff
pesa	44	63	19
sepl	5	8	3
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→ sesa	35	42	7
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Re-surveyed plots (n = 54)

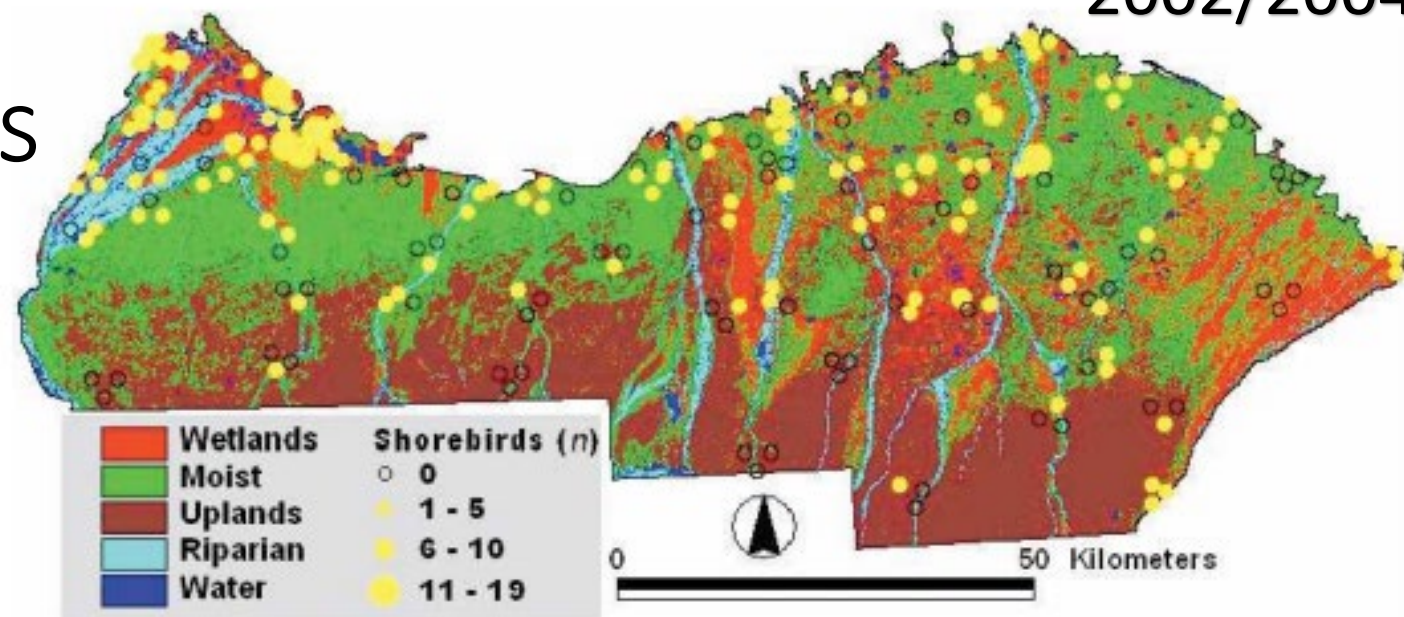


species	2002/04	2019	diff
pesa	44	63	19
sepl	5	8	3
wisn	0	1	1
→ sesa	35	42	7
→ stsa	10	11	1
→ bbsa	8	8	0
amgp	20	18	-2
dunl	8	2	-6
lbdo	5	2	-3
reph	6	2	-4
rnph	42	37	-5
rutu	4	3	-1
whim	3	1	-2
bbpl	1	0	-1
basa	1	0	-1
sand	1	0	-1
→ Total	193	198	5

2002/2004

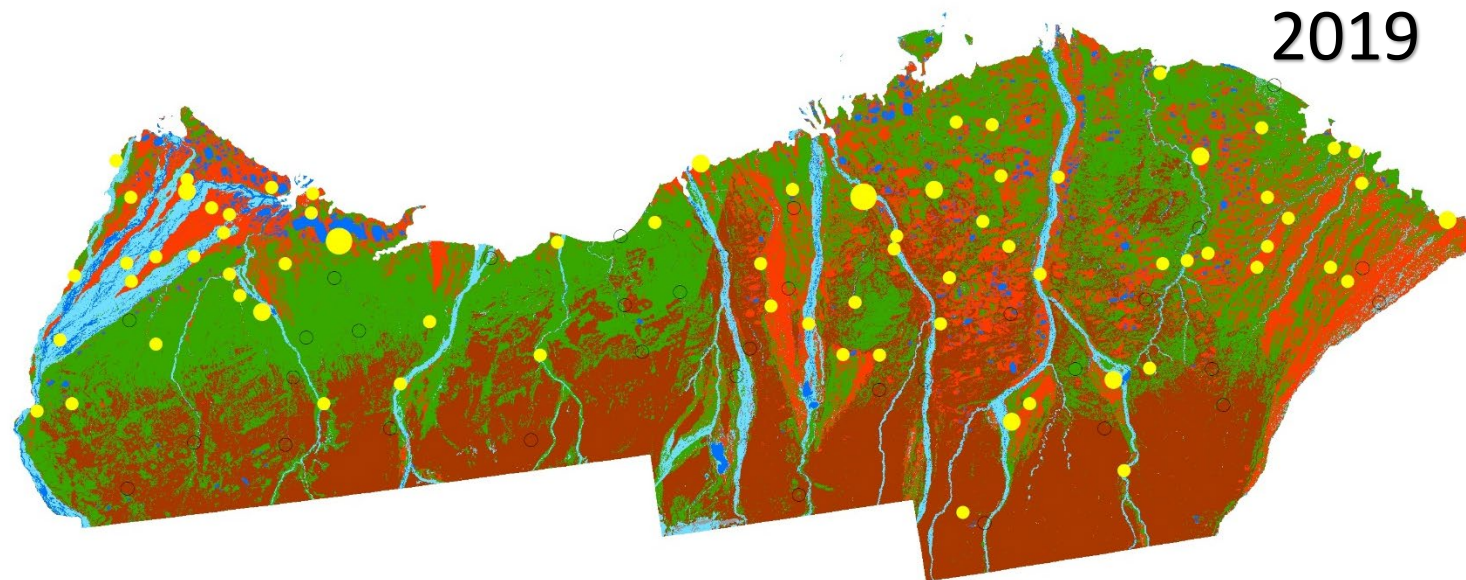
Number of Individuals

- Fewer locations in 2019 with many individuals detected
- Although fewer plots surveyed in 2019



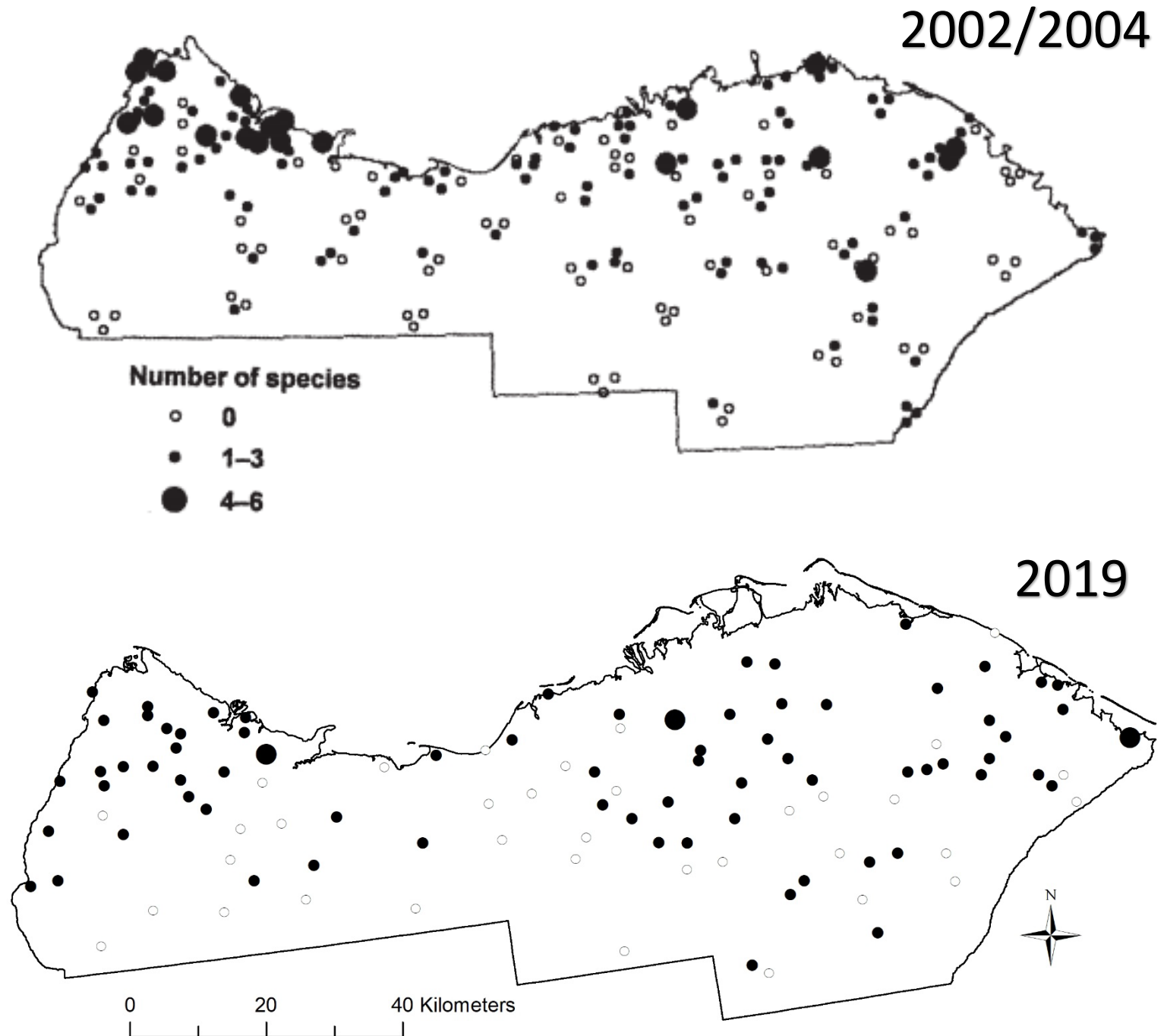
- Consistent that areas associated with wetlands especially around Canning River had greatest counts

2019



Species richness

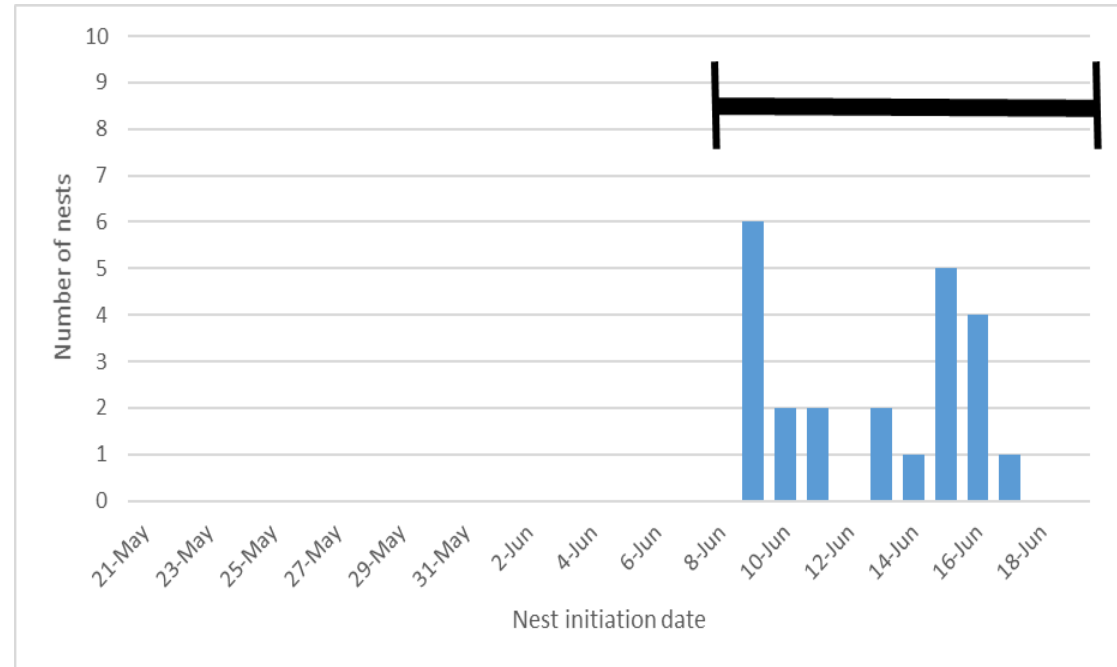
- Fewer locations in 2019 with high diversity
 - Although fewer plots surveyed in 2019
- Consistent that areas associated with wetlands had higher diversity; however, plots around Canning River showed much lower diversity



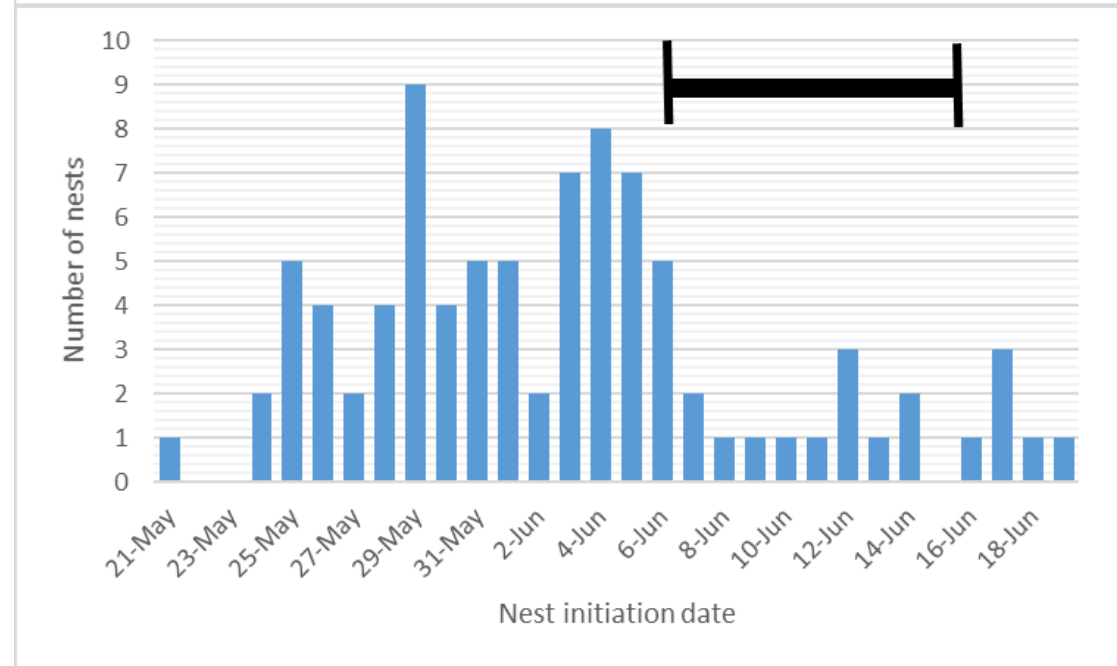
Differences in timing

- Survey timing was similar between years
- Nest initiation dates were much earlier in 2019 as compared to 2004
- Potentially resulting in decreased detections in 2019

2004



2019



Future work

- Repeat PRISM surveys in 2020 to determine if declines are real or artifact of survey timing, annual variability, etc.
 - Surveys were later than ideal given annual phenology
- Continue estimating landscape-level nest survival rates using minimally invasive techniques to provide a baseline estimate of nest survival prior to oil and gas development



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 - Migratory Bird Management
 - Arctic National Wildlife Refuge
 - Refuge Inventory and Monitoring Program
 - Science Applications



Questions?

