Deciding which plots to include / exclude

Plots that had rapid surveys conducted multiple times in the same year

-plots with 2 observations: timing doesn't appear to matter all that much if I look at the number of birds observed within each region.

-For the Alert plots, I wondered if the ones that were surveyed by 2 people might be better (1 might be missing birds, 3+ might be getting into weird methods that differ from later years). However, some only ever have 1, some have 2 more than once

-Are the Alert plots merged as described somewhere or separate segments of plots by habitat type, in which case, appropriate action would be to add them together? Looked at the one plot that was surveyed 7 times and the proportions don't add up to 100%

-I read one comment about some intensive plots being converted to rapid plots because they didn't have time to finish the intensive protocol

-Intensive plots that had no birds in them were excluded – definitely a bias for presence/absence

- Intensive plots surveyed using rapid methods
    - 53 plots. Why are they only in regions 3,4,8,10,12?

- Industry plots
    - 2008, Kiggarvik Mine Project, 1 plot x 2 surveys

- NOT SURE WHY – could they be intensive plots? There didn't appear to have any rows with final decisions associated with these plots. The fact that most of them were surveyed twice suggests that they could have been
    - 1995, Rasmussen Lowlands: 6 plots x 2 surveys each
    - 1997, Prince Charles Island: 2 plot x 2 surveys each
    - 2001, Alert: 1 x 7, 1 x 6, 3 x 4, 3 x 3, 7 x 2
    - 2001, Somerset Island, 3 x 2
    - 2003, Dewey Soper: 4 x 2
    - 2003, Southampton, 1 x 2
    - 2008, Mackenzie, 4 x 2

Plots that had rapid surveys conducted in multiple years

-re-surveyed plots: would it be better for me to have them as early ones to align with the population estimates, or would it better to use the new ones where survey methods might be more reliable?

-Are there any years that we know were more questionable based on weather or methods? (esp Rasmussen Lowlands

- Intensive plots
    - 25 plots, 2-6 years (Mackenzie Gas 2007-2014, North Hudson Barrens (Igloolik 2016 and 2017)
    - As long as they each have a rapid survey that was done in the same year (which isn't always the case), we can use the same intensive plots more than once to calculate detection ratios. Identical plots surveyed in different years have to be given unique IDs though (so IGL-IntB-2016 and IGL-IntB-2017 for example)

- Industry plots
    - 178 plots, 2–10 years (Meadowbank, Hope Bay, Kiggavik, Mackenzie Gas)

- Re-surveyed in 2019
    - 66 plots, Prince Charles Island and Rasmussen Lowlands

- Prince Charles Island 1996/1997 (but not 2019): 1996 was flooded, use 1997
    - 11 plots

- Rasmussen Lowlands 1994/1995
    - 10 plots

Comparing plots that were selected in different ways

-summed all birds that were observed in each survey, took the mean if they were surveyed multiple times

Comparing the total number of birds of randomly selected to non-randomly

comparison	mean_shorebirds	sd_shorebirds	n_plots
gis selected	5.6	5.6	1480
field modified gis selected	8.3	6.7	161
field selected - industry	2.6	2.4	553
field selected - intensive	7.5	5.0	68
field selected - other	11.8	12.7	278

```
Call:
lm(formula = mean_sum_birds ~ comparison + quality, data = test_sb)

Coefficients:
                                Estimate Std. Error t value Pr(>|t|)
(Intercept)                      7.4039     0.3777  19.604  < 2e-16 ***
field modified gis selected      3.2020     0.5596   5.722 1.21e-08 ***
field selected - industry       -1.7210     0.4092  -4.206 2.71e-05 ***
field selected - intensive       2.1049     0.5871   3.585 0.000344 ***
field selected - other           6.2734     0.4422  14.186  < 2e-16 ***
quality                         -1.1616     0.1912  -6.075 1.48e-09 ***

Residual standard error: 6.467 on 2017 degrees of freedom
  (73 observations deleted due to missingness)
Multiple R-squared:  0.1981,   Adjusted R-squared:  0.1961
F-statistic: 99.64 on 5 and 2017 DF,  p-value: < 2.2e-16
```

Plots that were field selected

- Intensive plots
    - 68 plots, Regions 4,5,6,8,9,10,12

- Industry plots: 533 plots. What were the methods used for field selection?
    - Amaruq & Meadowbank Mine Project: 85 plots
    - Gahcho Kué Mine Project: 25 plots
    - Hope Bay Mine Project: 111 plots
    - Izok Mine Project: 82 plots
    - Kiggavik Mine Project: 44 plots
    - Mackenzie Gas Project Affected Areas: 84 plots
    - Mary River Project: 97 plots
    - Meliadine Mine Project: 16 plots
    - Tahera Mine Project: 9 plots

- NOT SURE WHY – might be worth checking the comments on these ones
    - Eastern Foxe Basin: 89 plots (1996, 1997, 2003, 2019) 1996 due to weather – exclude?
    - Mackenzie: 83 plots (2005, 2006, 2007, 2008, 2009)
    - North Archipelago: 66 plots (2001, 2007, 2011)
    - Northwest Hudson Barrens: 2 plots (2016)
    - Queen Maud Gulf: 8 plots (2010)
    - South Archipelago: 9 plots (2001, 2011)
    - Southampton: 6 plots (2004)
    - Southwest Hudson Barrens: 15 plots (2008, 2015)

Examples:

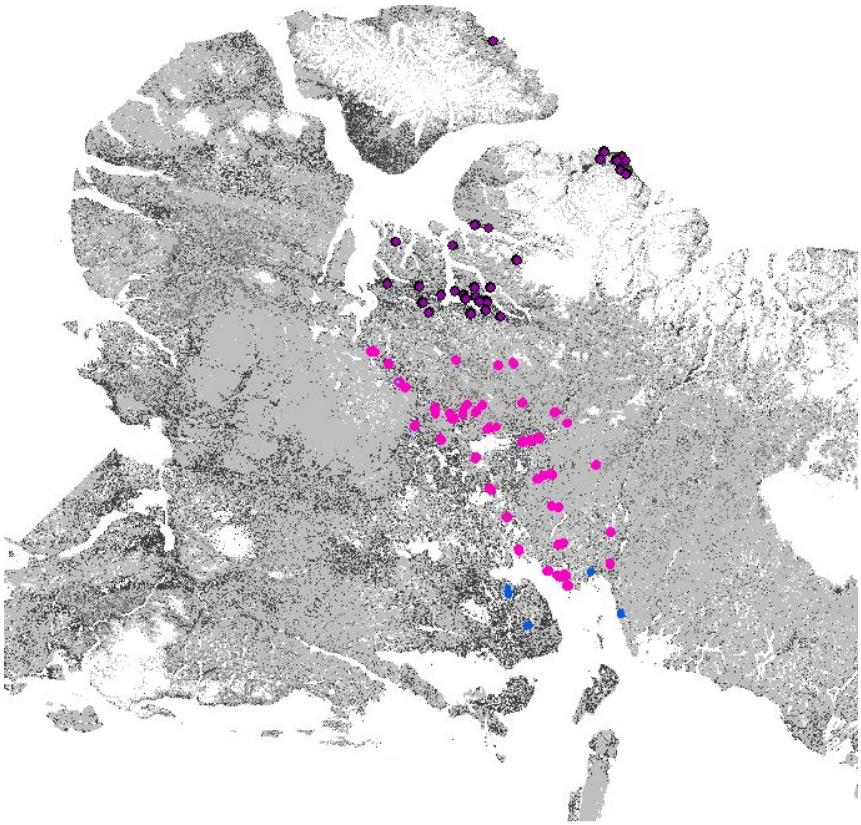
- SOI-0082C, 2001, North Archipelago
    - Plot_Comment_1: “Replacement for 715 which we couldn't reach due to fog.”
    - Comment_1: “ Four of us walked in different directions for 20min. looking for shorebirds in the best places we could find.”
    -
- ALE-2529,
    - Comment_1: surveyed by skidoo

- 14 plots containing or adjacent to human developments

KWI-0012
MDW-0099A
ALE-1670
ALE-1670

ALE-1670
ALE-1670
ALE-1670
ALE-1670
ALE-7140
CLGT-92020
CLGT-92021
CLGT-92022
RAS-0072
RAS-0030

Lines, Clusters



Plots that were GIS selected, field modified

- Intensive plots
    - 1 plot, 2006, Southampton region, Coats Island, COI-IntB

- NOT SURE WHY – might be worth checking the comments on these ones
    - Eastern Foxe Basin: 4 plots (2003, 2004)
    - Mackenzie: 7 plots (2005, 2006)
    - North Archipelago: 3 plots (2001, 2007)
    - Northwest Hudson Barrens: 55 plots (1994, 1995, 2015, 2019)
    - Queen Maud Gulf: 20 plots (2006, 2010)
    - South Archipelago: 67 plots (1994, 1995, 2001, 2012, 2019)
    - Southampton: 1 plot (2003)
    - Baffin: 1 plot (2018)
    - Quebec: 2 plots (2002)

Examples:

Seems OK?

- Couldn't cross a river, adjusted accordingly
- Changed orientation

Not sure

- Moved due to high shrub, large lakes, mudflat, snow cover – how were they modified? Did people just choose an spot that looked like there would be more birds?

Plots with a more or less than two surveyors

	1	2	3	4	5
Baffin	1	90	79	0	0
Central Ellesmere	3	44	0	0	0
Eastern Foxe Basin	1	226	10	16	0
Mackenzie	6	393	21	2	0
North Archipelago	204	212	2	2	3
North Hudson Barrens	29	200	19	0	0
Northwest Hudson Barrens	0	80	9	0	0
Quebec	98	47	1	0	0
Queen Maud Gulf	40	325	17	1	0
South Archipelago	46	218	20	0	0
Southampton	2	82	4	0	0
Southwest Hudson Barrens	40	585	83	11	3
<NA>	0	10	0	0	0

-Some of them might be fine. ie Eastern Foxe Basin with 4 surveyors was done by us in 2019. We took care to follow the protocol as closely as possible but split the plot in 2 between 2 groups

-Comments suggest some of them might be questionable. ie. North Archipelago 2001. “Four of us walked in different directions for 20min. looking for shorebirds in the best places we could find.”

-Would expect the plots with only 1 surveyor to be underestimates

-Could some of the 1 person surveys just be missing the second person’s name?

Doesn’t appear to have a large impact on the number of shorebirds observed

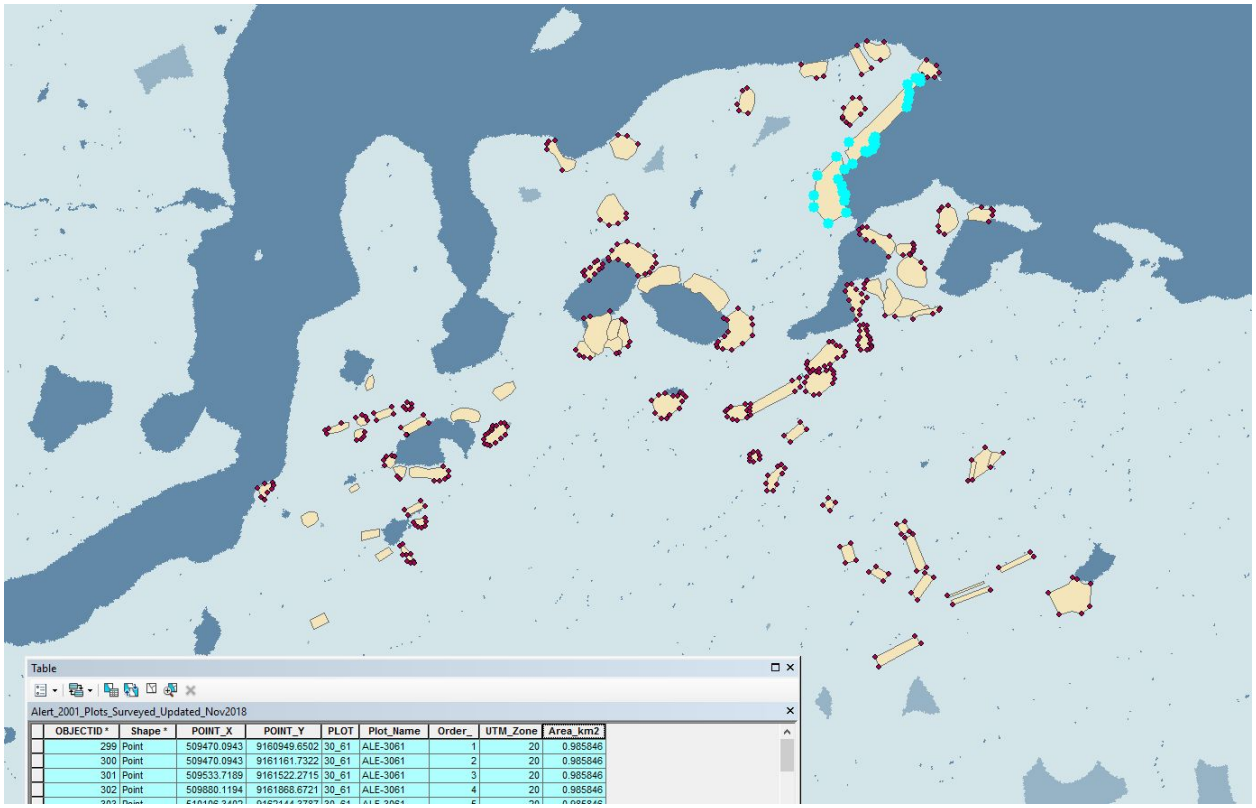
n_surveyors	mean_birds	sd_birds
1	7.019324	6.552967
2	5.815758	7.411509
3	5.578313	6.758376
4	8.172414	7.653519
5	7.000000	6.693280

Plots with a weird areas, shapes, proportion surveyed

Shapes:

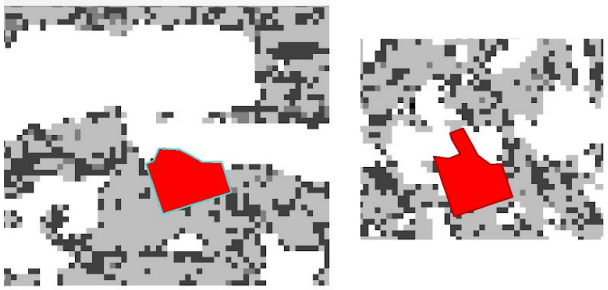
	irregular polygon
Baffin	1
Central Ellesmere	0
Eastern Foxe Basin	1
Mackenzie	1
North Archipelago	67
North Hudson Barrens	0
Northwest Hudson Barrens	0
Quebec	28
Queen Maud Gulf	5
South Archipelago	1
Southampton	1
Southwest Hudson Barrens	1
<NA>	0

Alert plots:

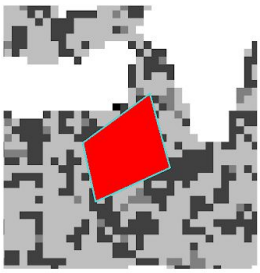


Quebec plots:

Some of the

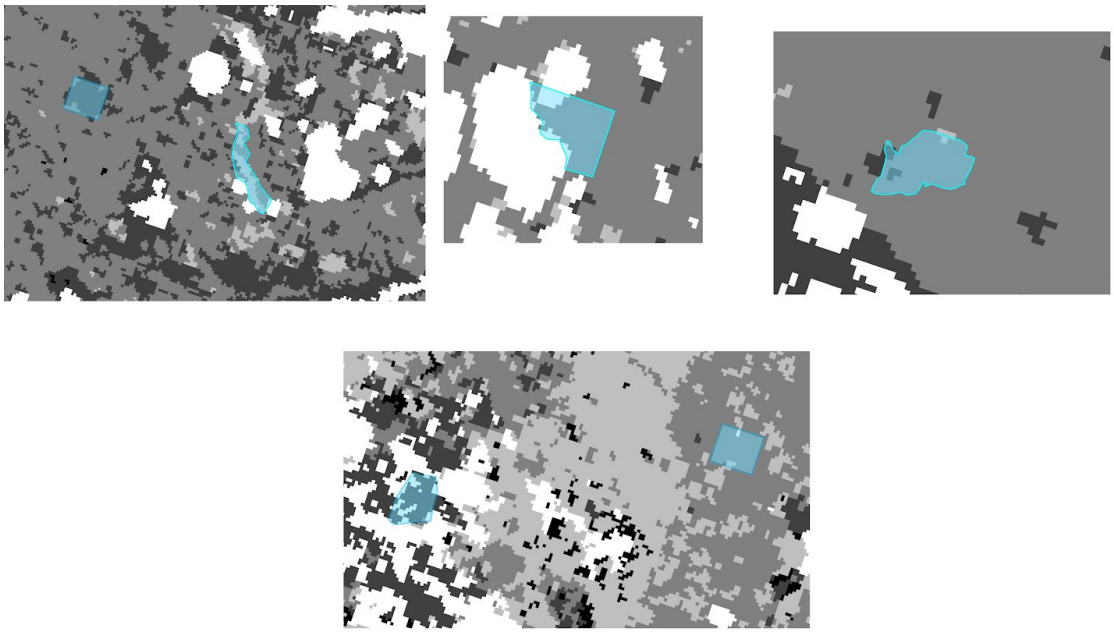


On the edge of a water body

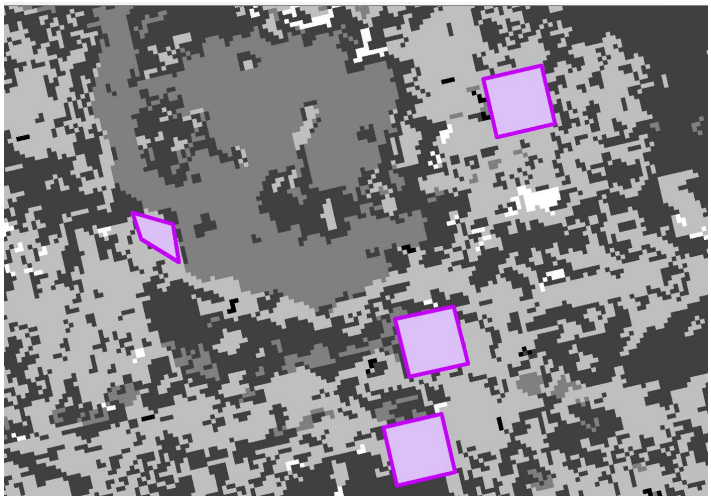


Weird angle between corners?

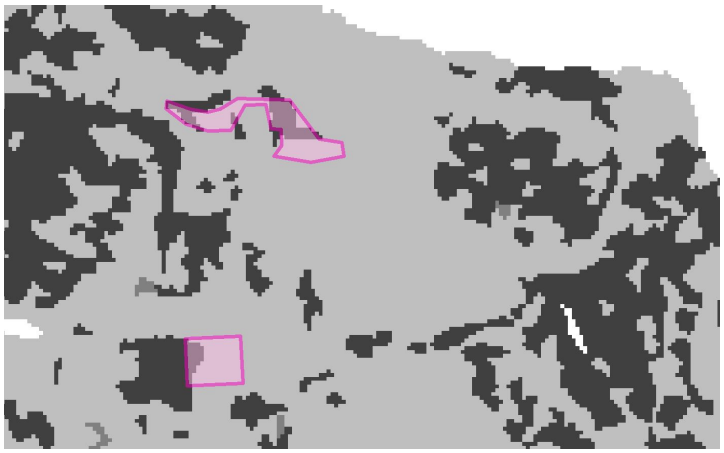
Queen Maud Gulf (2001) - some following water bodies, some following habitat types

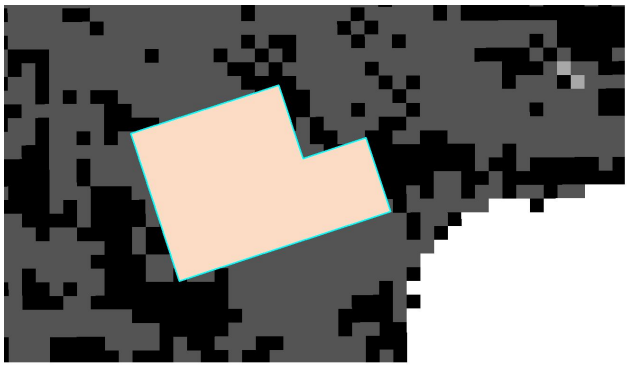


Southampton Island 2004



Somerset Island 2001





West Baffin (region 3), 2004

Mackenze Delta Plot: regular polygons in the GIS but have >4 permimeter coordinates in the excel file. Which one is correct? (mackenzie Delta plot for sure. Also potentially Somerset Island plot Meadowbank mine plot has corders but no “surveyed” polygon.) - indicates that GIS coordinates and excel coordinates don’t always watch. which ones are correct/cleaned/verrified??

SIZES:

>25% difference

Smaller than 9 ha (300m x 300m): 32 plots, mostly Alert

Larger than 20 ha (500m x 400m): 44 plots, mostly Alert

PROPORTION SURVEYED:

61 plots with less than 100% surveyed

56 < 90%

48 < 75%

32 < 50%