Landscape Use of Post-breeding Rusty Blackbirds in Northern New Hampshire

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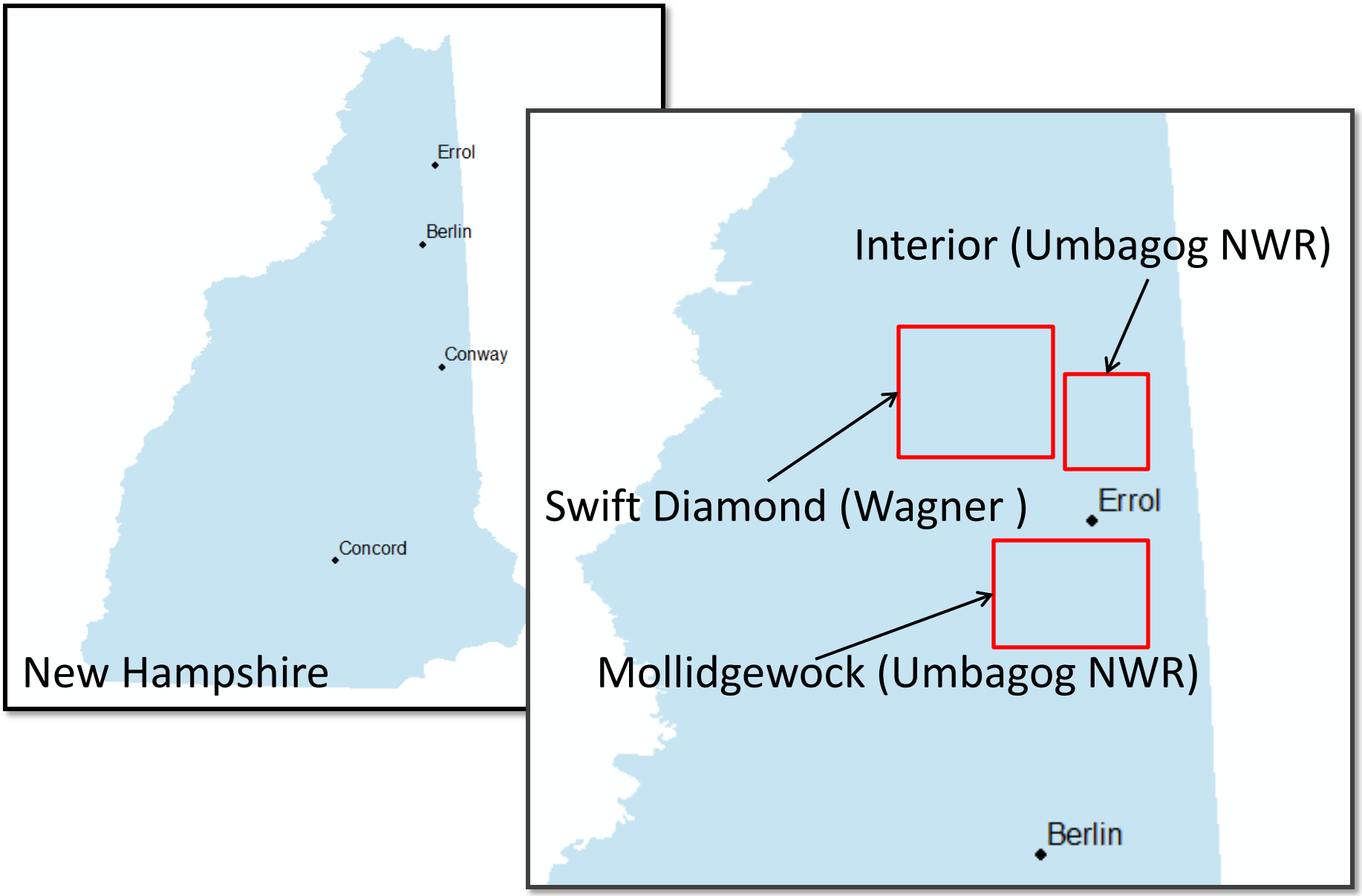
Objectives

- Determine landscape features that drive Rusty Blackbird landscape use
- Compare with nesting
- Generate a prediction of new RUBL locations
- Provide land managers with recommendations for managing breeding landscapes

Study Sites in Androscoggin Valley, NH



Methods: Capture and Telemetry

- 2010-2012
- June to August
- 1 location/ bird /day
- Both adults and fledglings
- Fledglings fitted as nestlings

Methods: Species Distribution Model

- Produced 14 variables
- Generated random points for a 0-1 binary response
- Performed spatial logistic regression
- Used model selection to determine best model
- Used SAM to account for space in the error term

14 Variables

NH Rivers and Streams

3rd to 6th order streams

1st to 3rd order streams

any order stream

NH Wetlands

beaver created wetland

seasonal wetland

forested wetland

any wetland

NH Soils

poorly drained

slope 1-8%

Forest Stand Cover Maps

alder wetland

any vegetated wetland

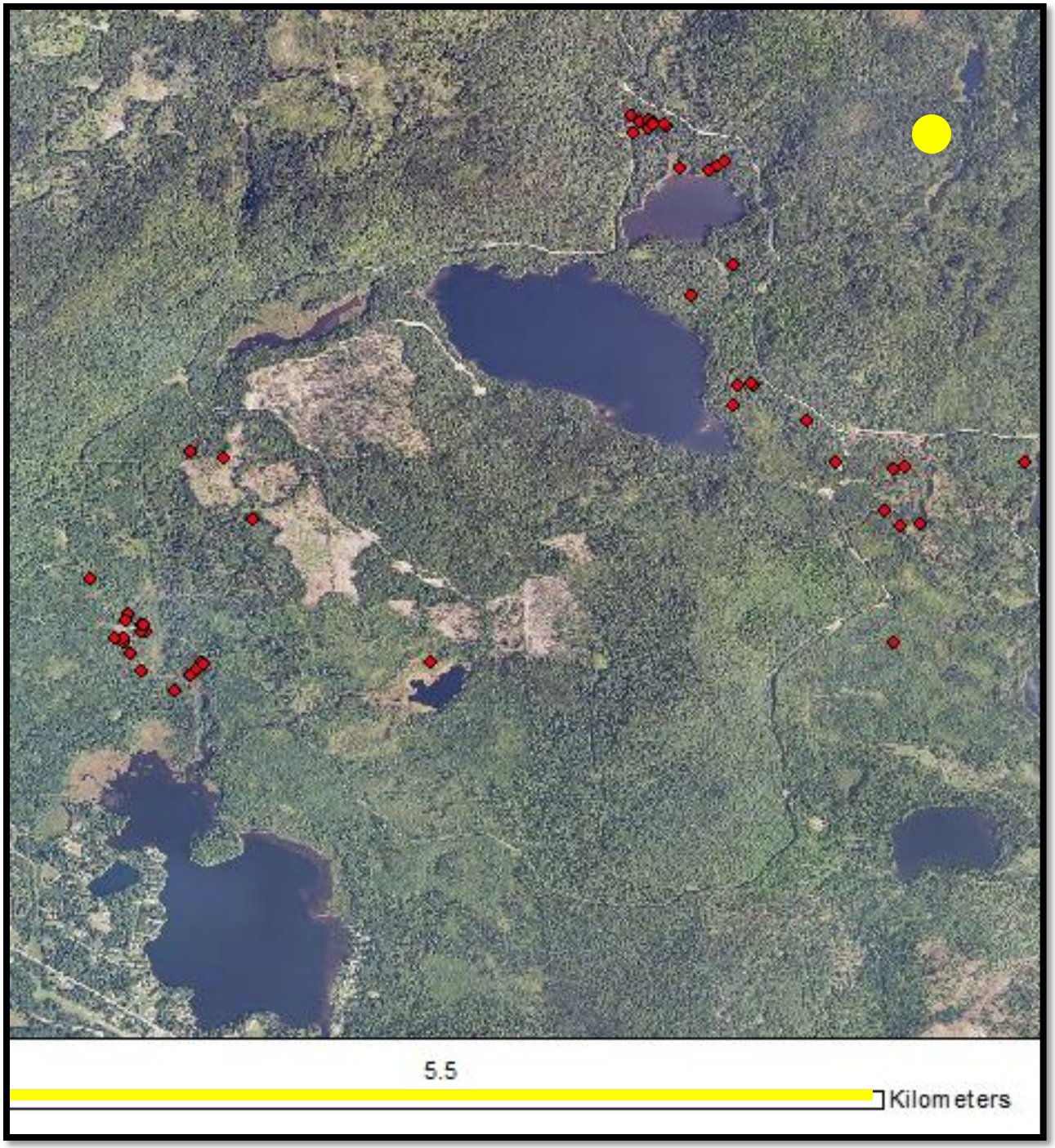
softwood timber

seedling/sapling timber

softwood AND seedling/sapling

Results

- Radio-transmittered 61 Rusty Blackbirds 2010-2012
- Subset of 38 birds: 28 adult and 10 HY → survived >30 days
- 735 points (deleted records from every other day)
- Generated 806 pseudo-absence points
- Did not include correlated variables (>0.5) in same model


5.5
Kilometers

Post-breeding Results

- No difference between adults and HY
- No difference between years
- Similarities between sites → saplings, any wetland
- Differences between sites → distance to streams
  slope or drainage

All sites and years combined: saplings, any wetland, any order stream, low slope

Variable	Scaled Estimate
Proportion of **Any Wetland** Type	7.2 times / +5%
Distance to Any order **Stream** (1^{st} -6^{th})	-1.3 times / +50m
Proportion of **Saplings**	3.3 times / +5%
Proportion of **Slope <8%**	2.4 times / +5%

Compared to Nests

- 37 nest points >100m apart
- 57 pseudo absence points
- Spatial logistic analysis

- Increasing proportion of saplings → 8.8 times / +5%
- Increasing proportion of slope < 8% → 3.3 times / +5%
- Decreasing distance to any order stream → -1.3 times /+50m
- **Wetlands not important**

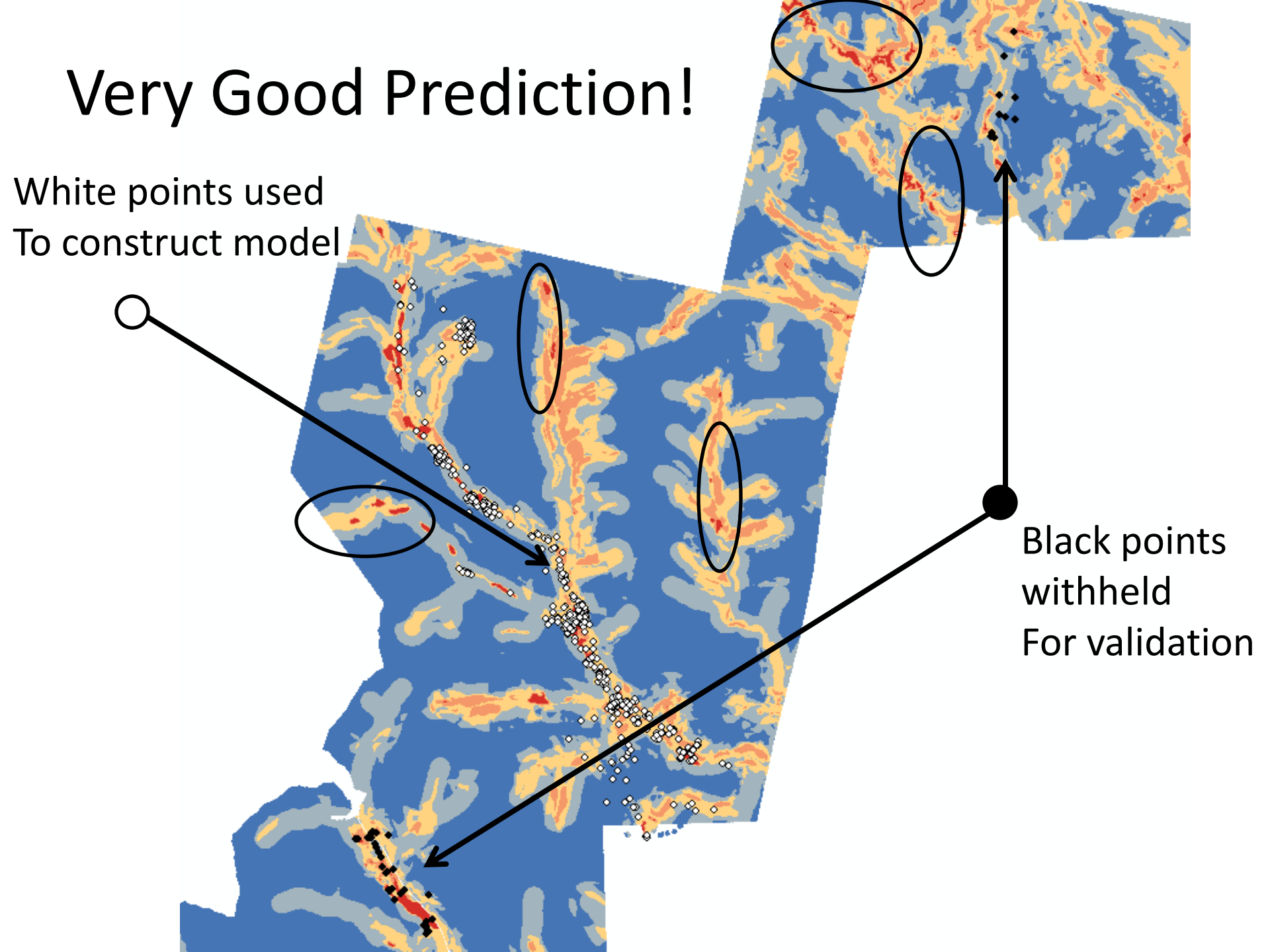
Nest Success based on 22 days exposure

Group	Daily SR	SE	LCI	UCI	Nest success
Overall (n=59)	**0.981**	**0.005**	**0.969**	**0.989**	**0.66**

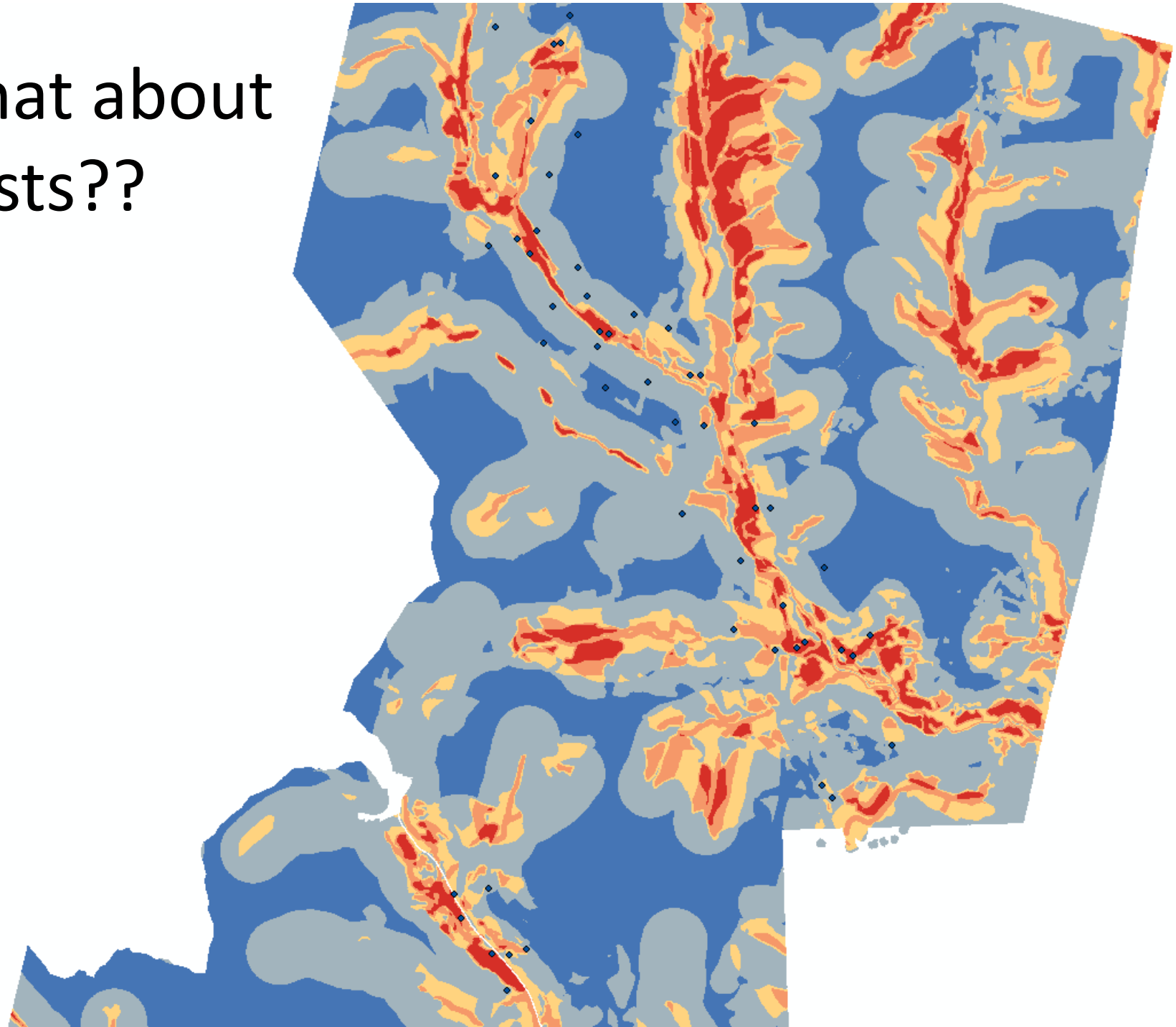
Post-Breeding Survivorship 12 weeks

Group	Weekly SR	SE	LCI	UCI	12 week
HY (n=22)	0.925	0.023	0.866	0.959	**0.39**
Adults (n=35)	0.984	0.007	0.961	0.993	**0.82**

Very Good Prediction!



What about Nests??



- Saplings in RUBL territories are in poorly drained areas resulting in stunted trees
- Mimics boreal forest habitat
- Hydrology provides the stress that forces trees to grow more slowly and increase window of opportunity for habitat

- Wetlands are important for post-breeding but not necessarily for nesting
- Adults capable of covering large distances
- Leave young fledglings (<1 week) unattended while searching for food in distant wetlands
- May contribute to low fledgling success in 1st week

Rachel Rabinovitz

Recommendations

- For Rusty Blackbird habitat: any wetlands within 200m from any order stream should be managed in the sapling stage over time.
- Need to determine optimal size and age of these stands.
- Would like to take this model to other states/provinces

Thanks

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Dr. Robert Cooper

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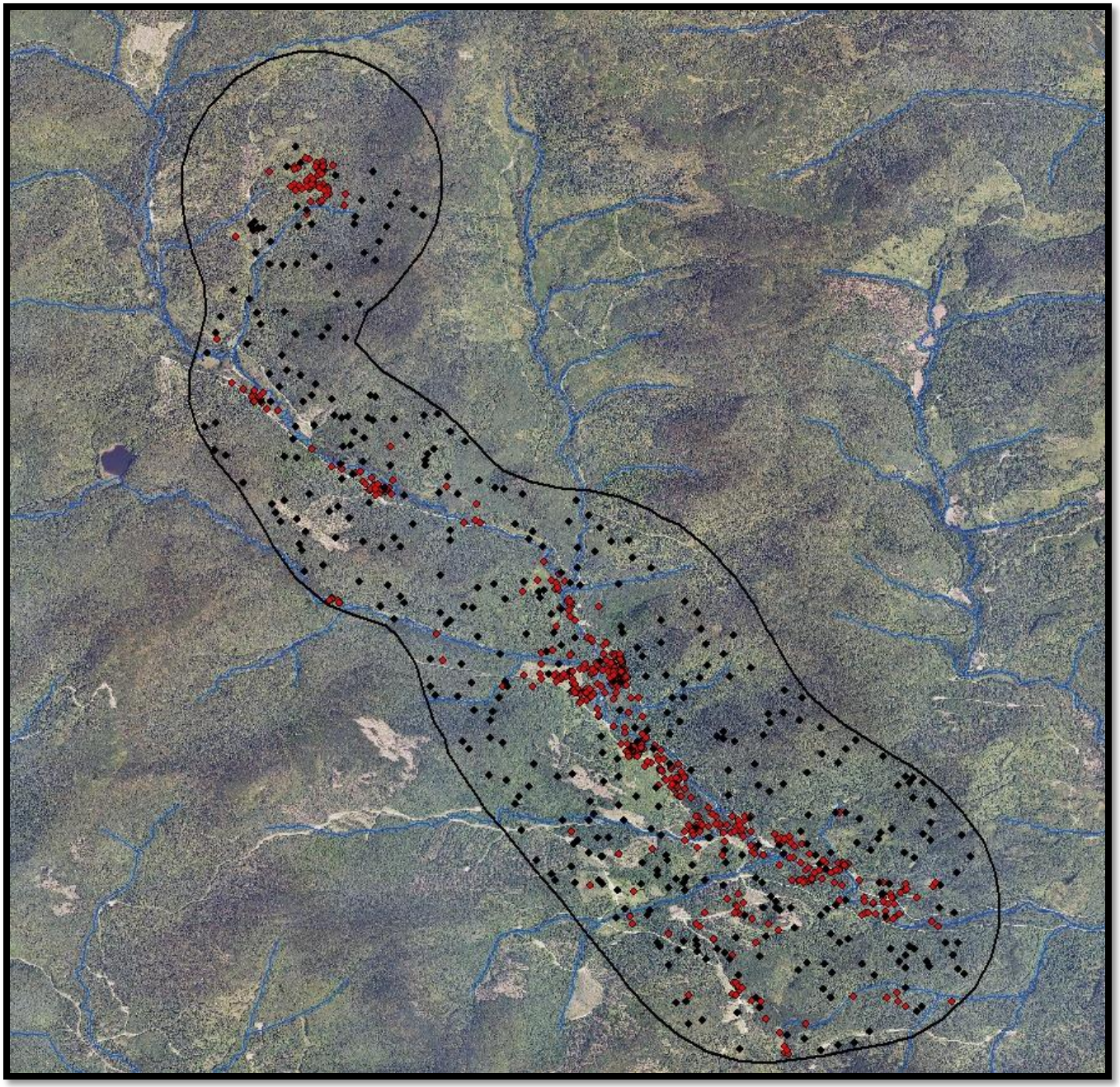
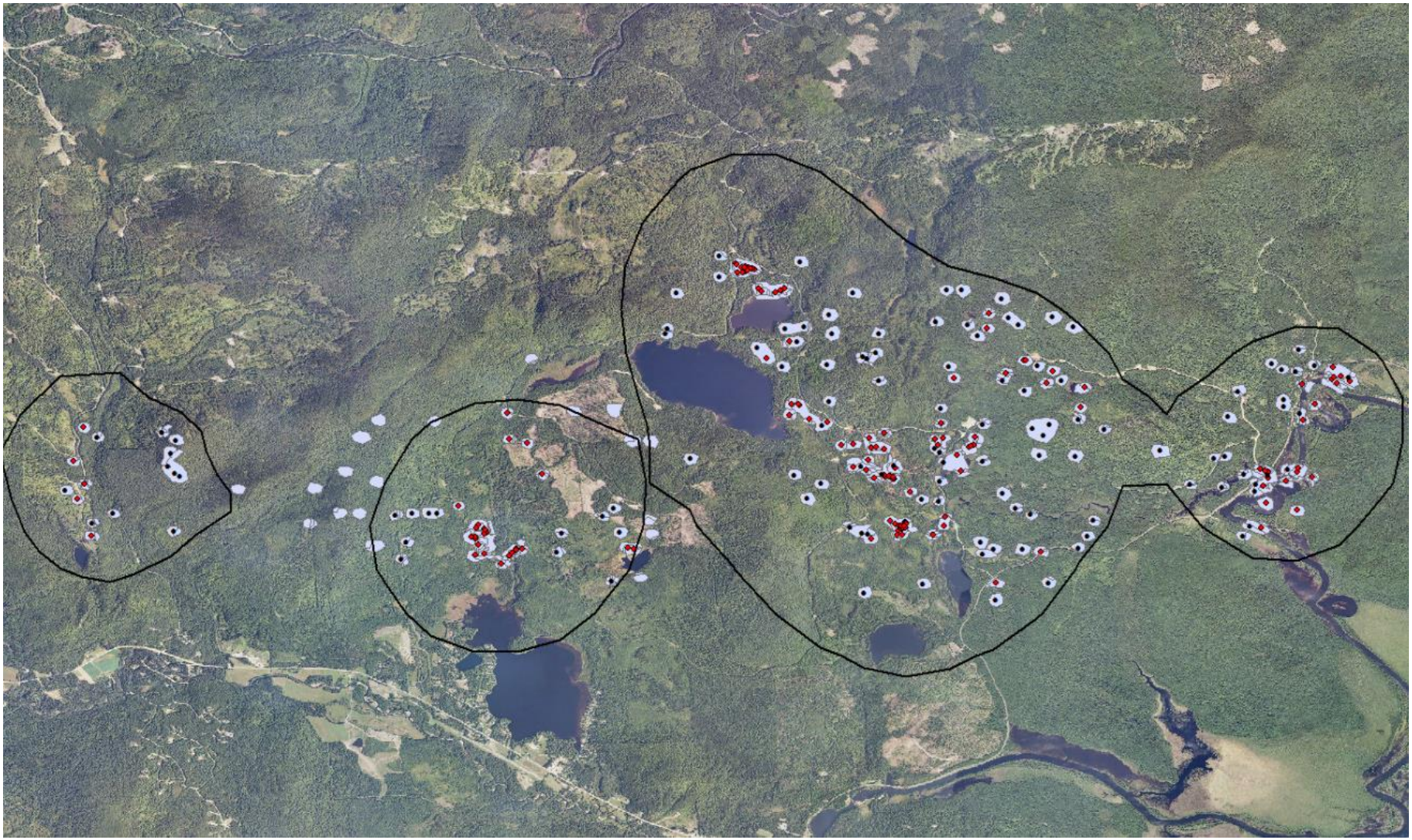
Questions?

Rachel Rabinovitz

Swift Diamond Telemetry and Background Points



Stand layer for Mollidgewock

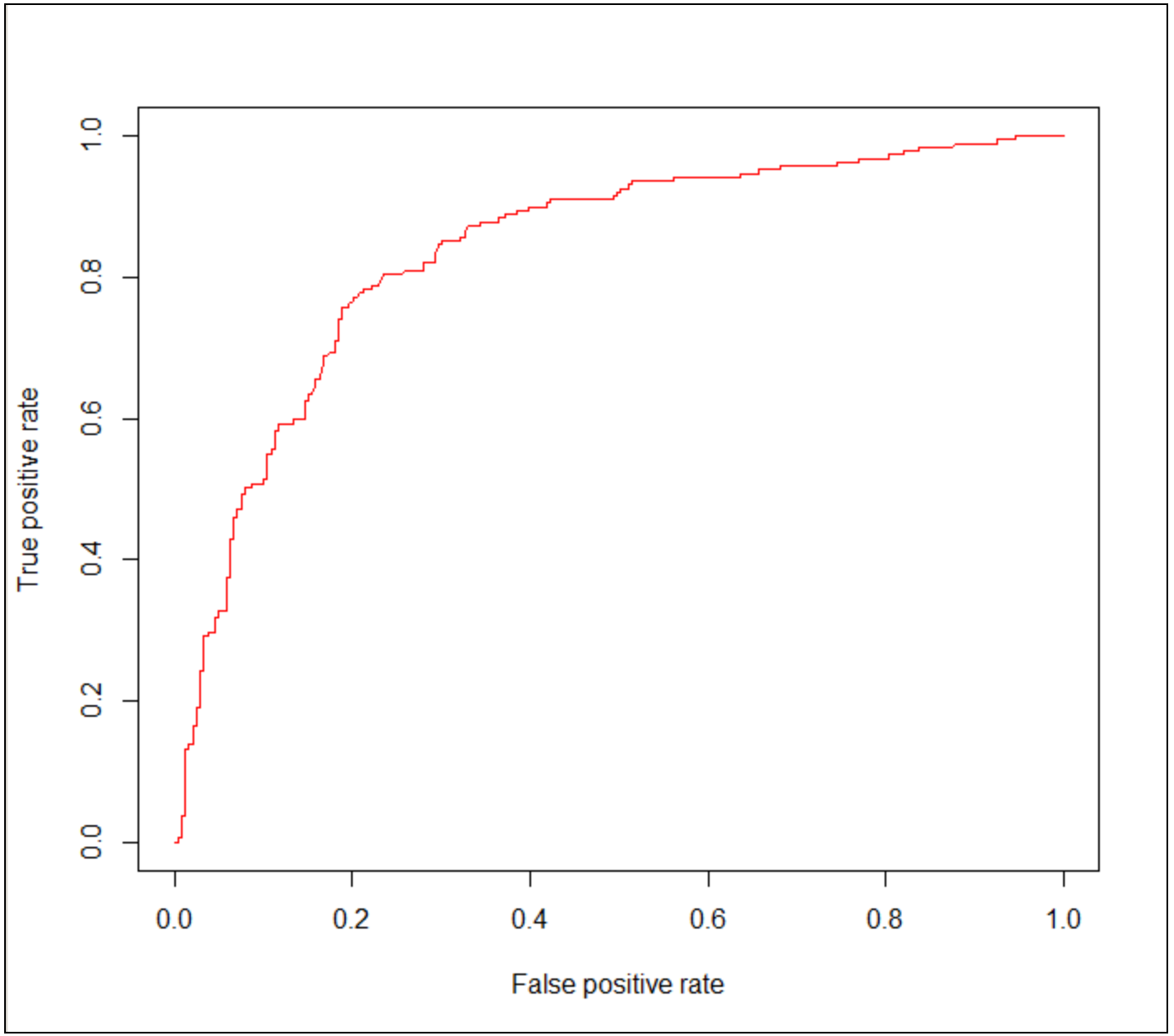


Results: HY

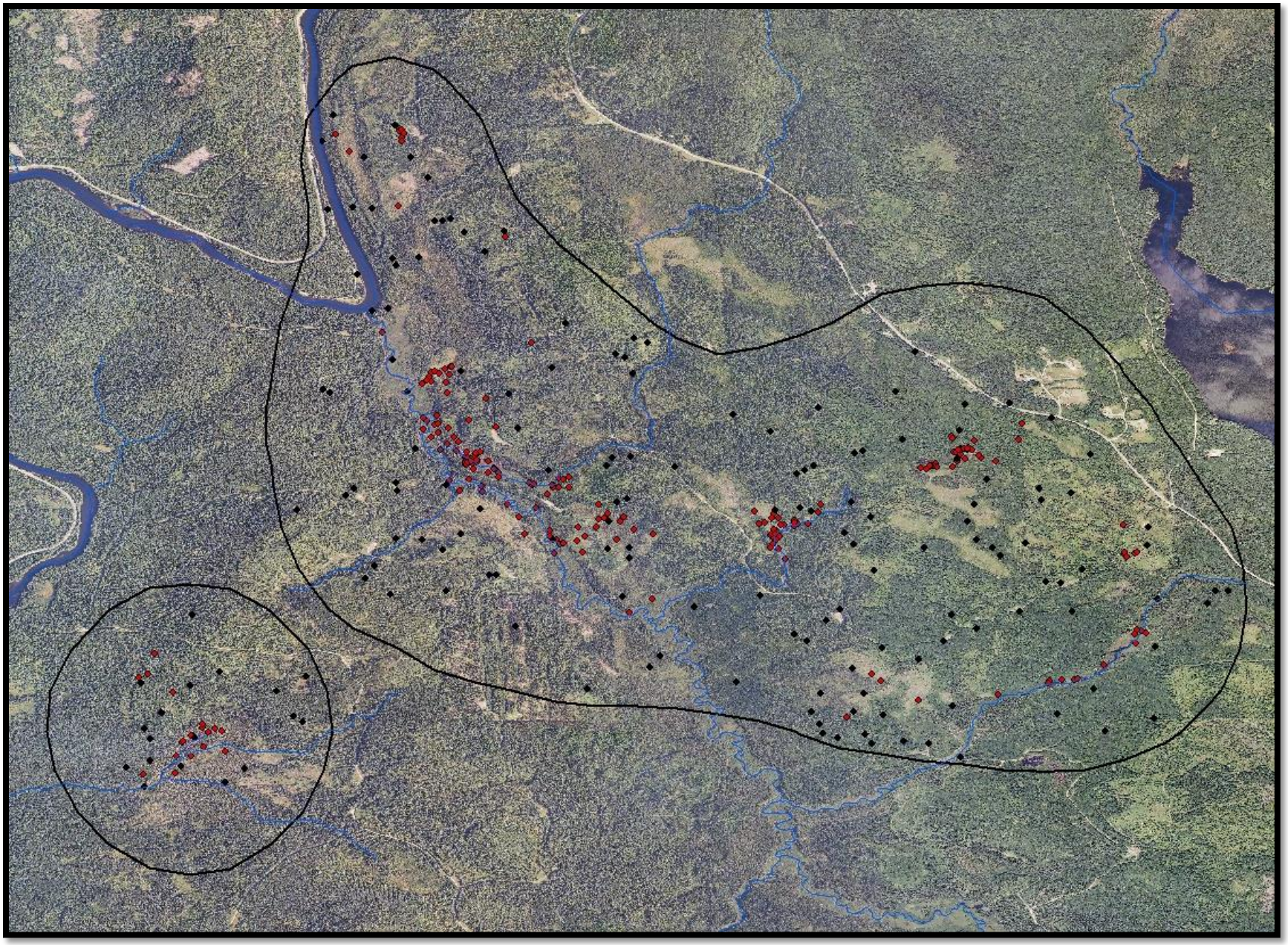
Confidence set of Models	K	AICc	ΔAICc	AICc Wt
presence ~ distance to streams + prop all WL + prop saplings	4	452.93	0	0.61
presence ~ distance to streams + prop all WL+ prop saplings + prop forested WL	5	454.67	1.74	0.25
presence ~ distance to streams + prop all WL + prop saplings + prop forested WL + prop softwood	6	455.85	2.92	0.14

Variable	Estimate	Exponentiated Estimate	Scaled Estimate
Distance to Streams	-0.004	0.99595	-0.04X/10m
Proportion of All Wetlands	3.36	28.7	22X/1%
Proportion of Saplings	1.6	4.96	5X/1%

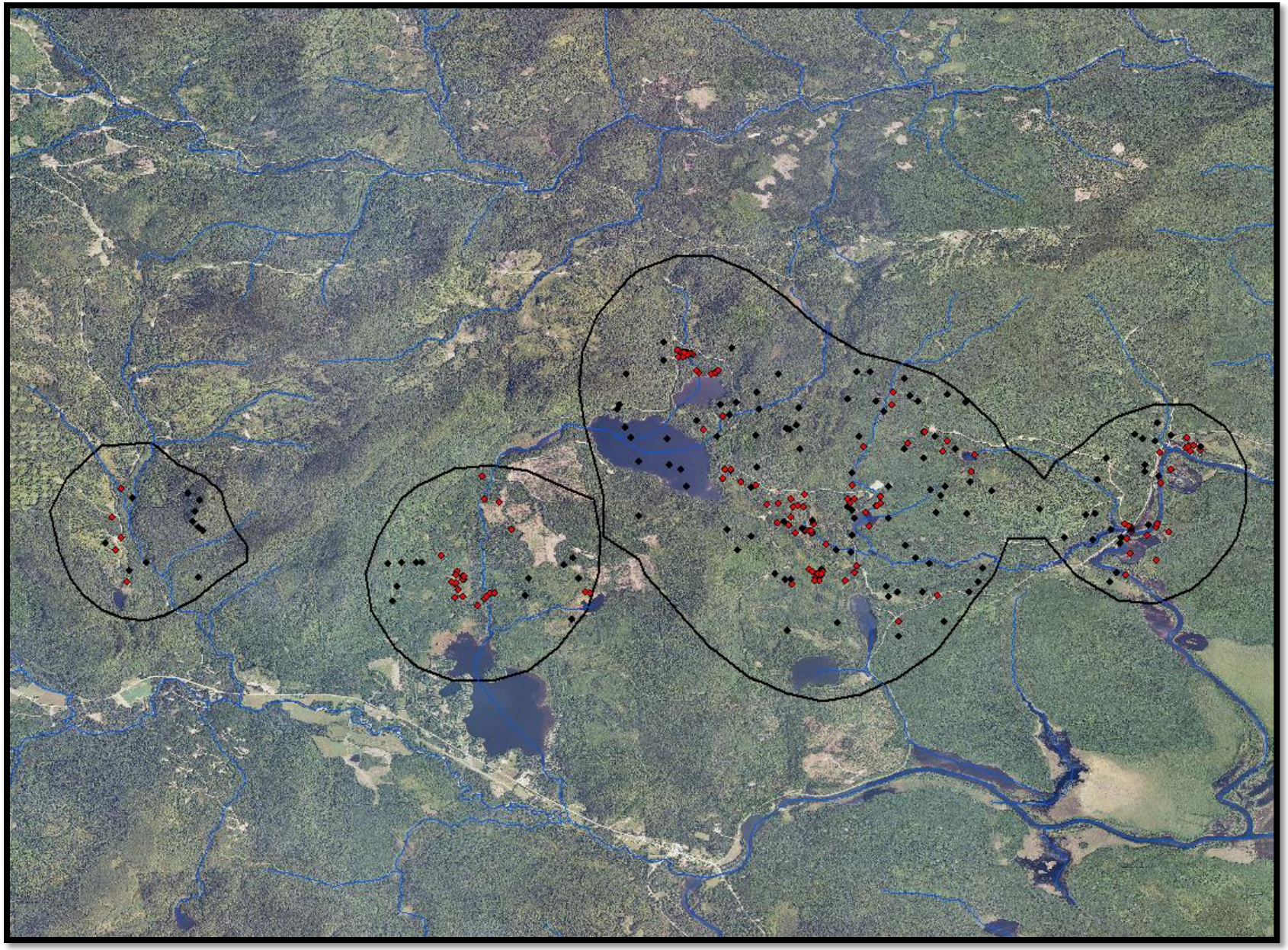
ROC curve


True positive rate
0.0
0.2
0.4
0.6
0.8
1.0
False positive rate
0.0
0.2
0.4
0.6
0.8
1.0

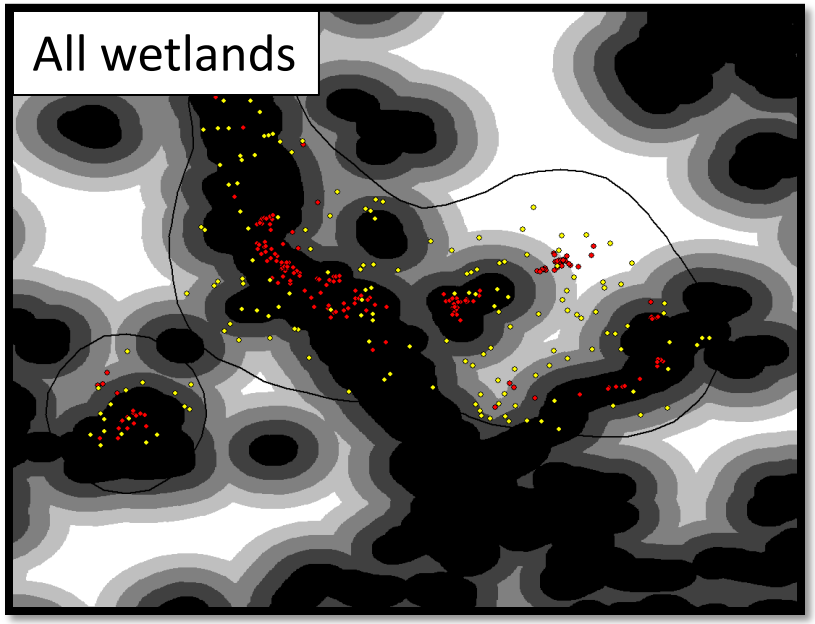
Mollidgewock Telemetry and Background Points

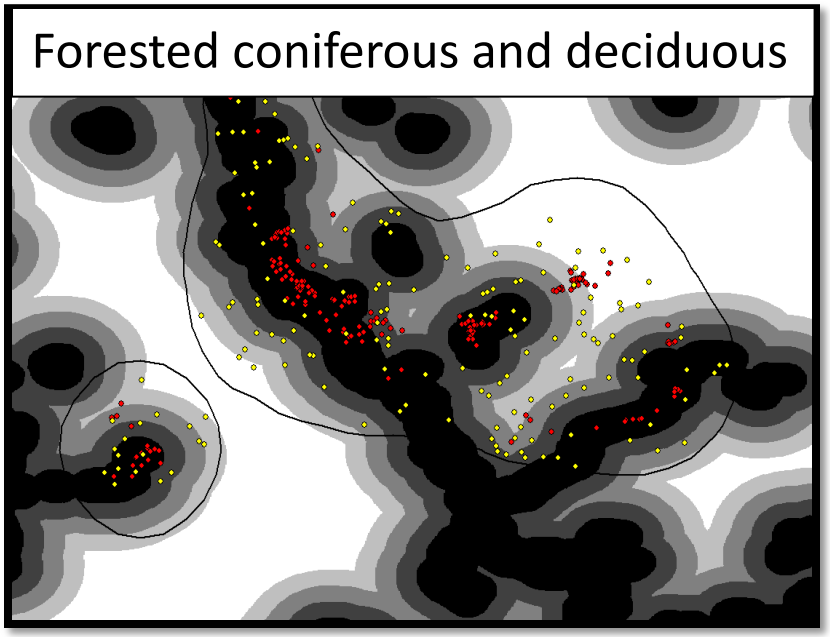


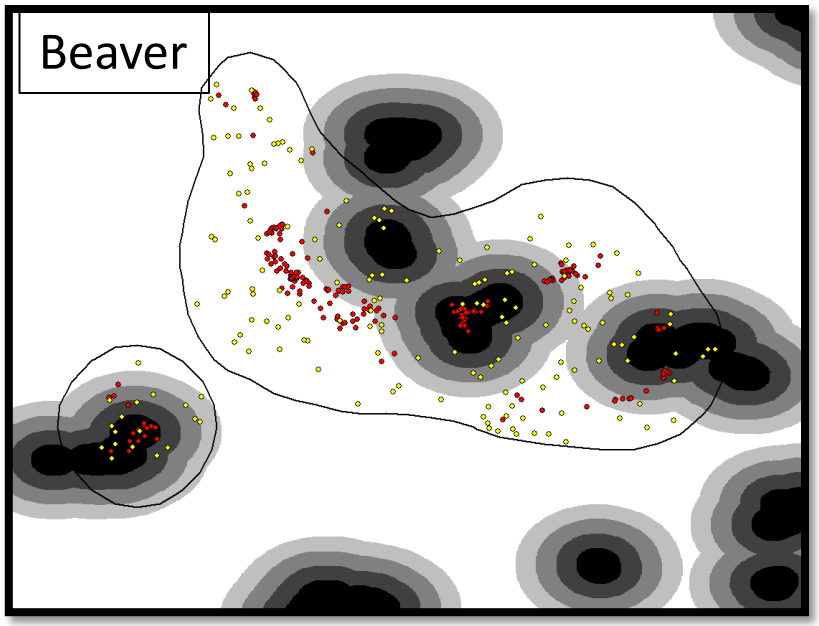
Interior Telemetry and Background Points

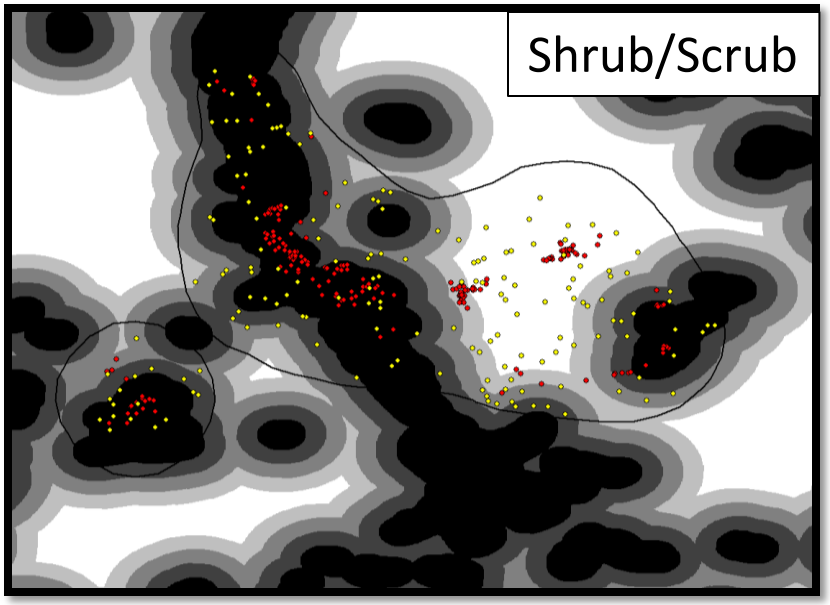


Distance to Wetlands Variables at Mollidgewock



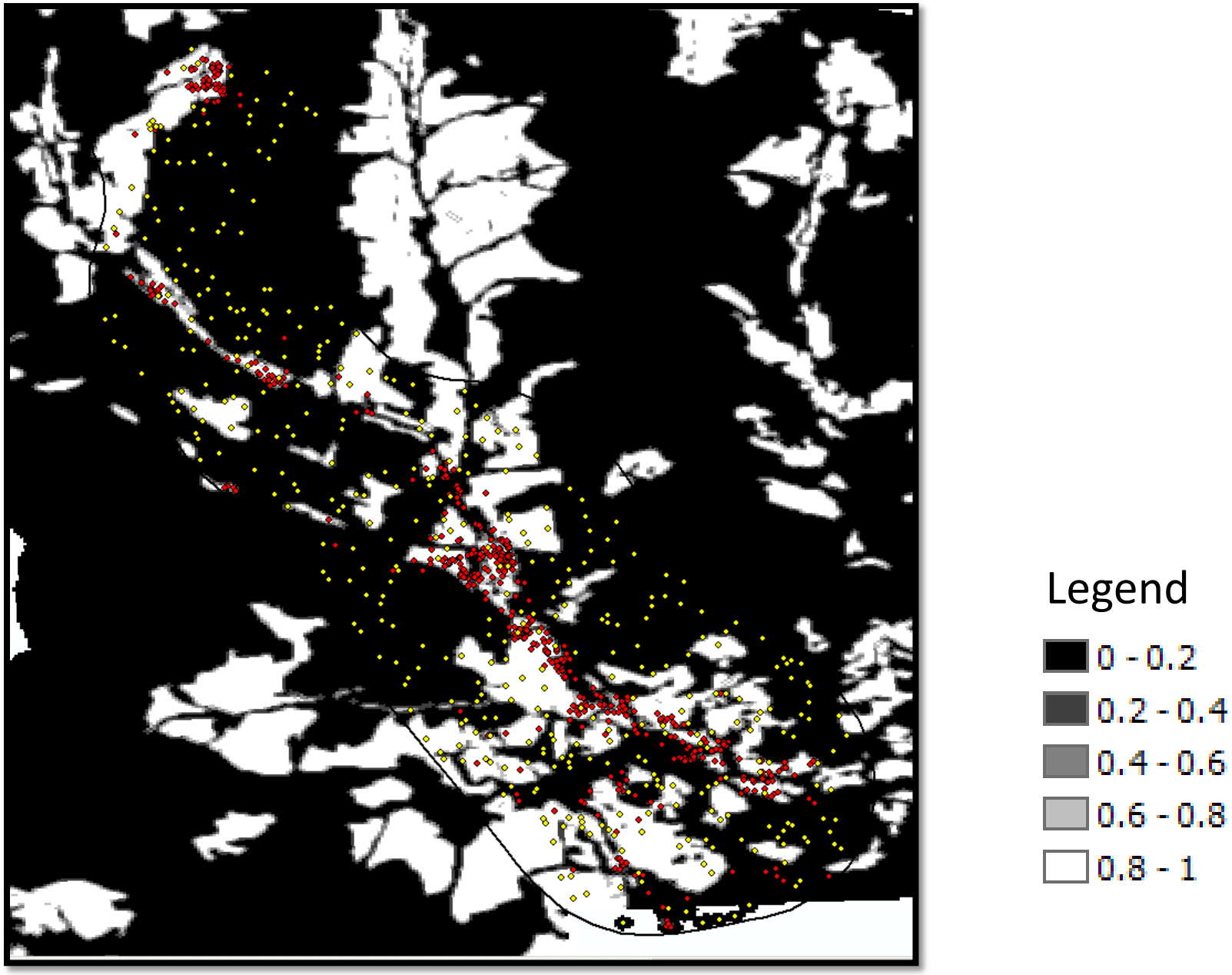


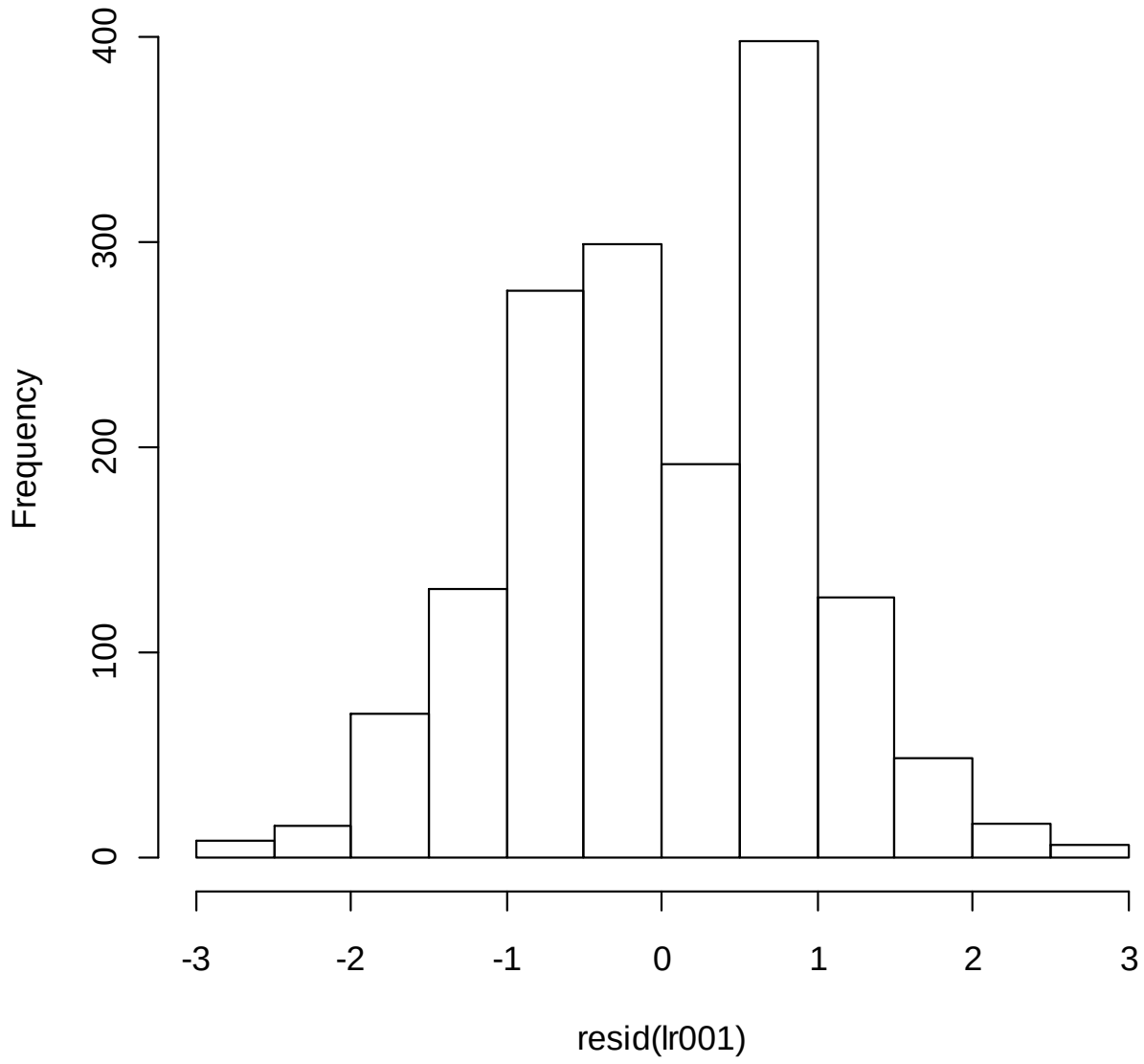




1.202 Mollidgewock

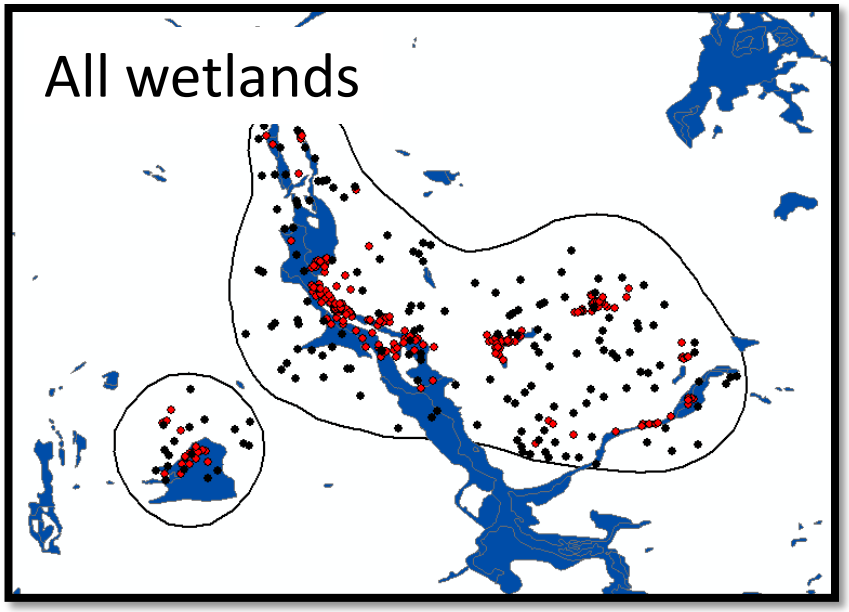
Proportion of Saplings in 30 m buffer at Swift Diamond

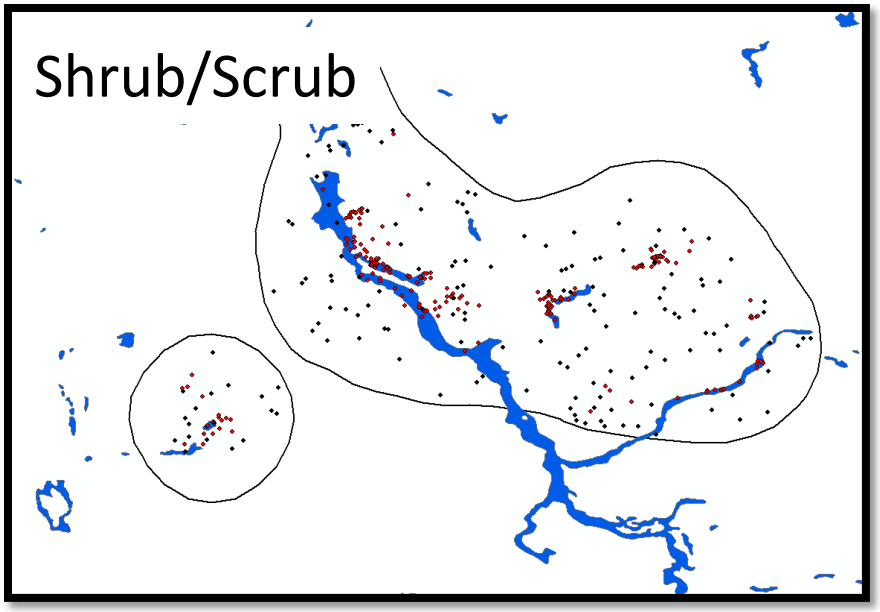


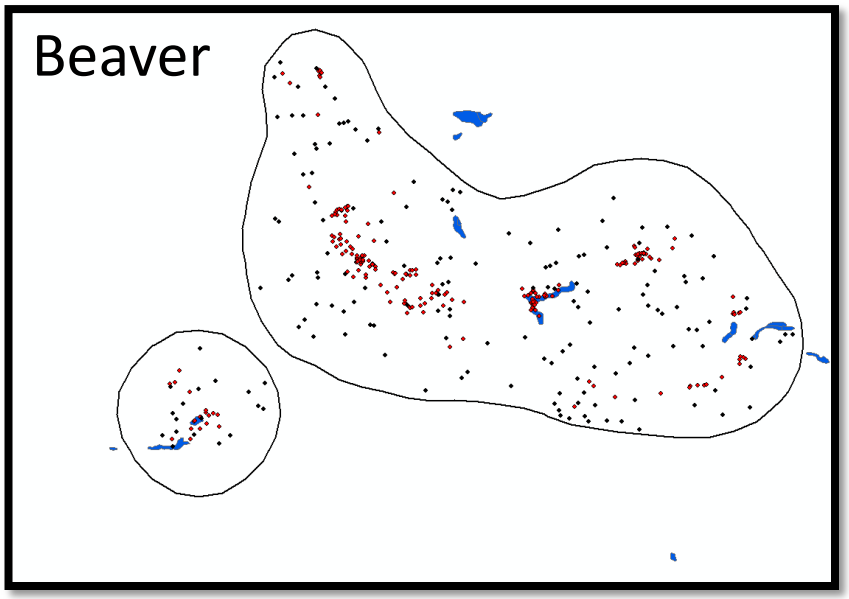


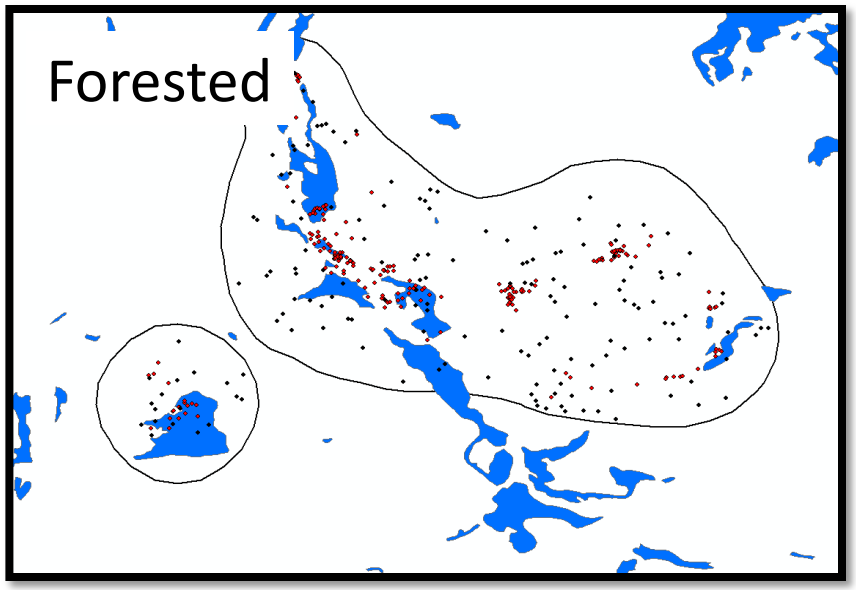
Histogram of residuals from global model

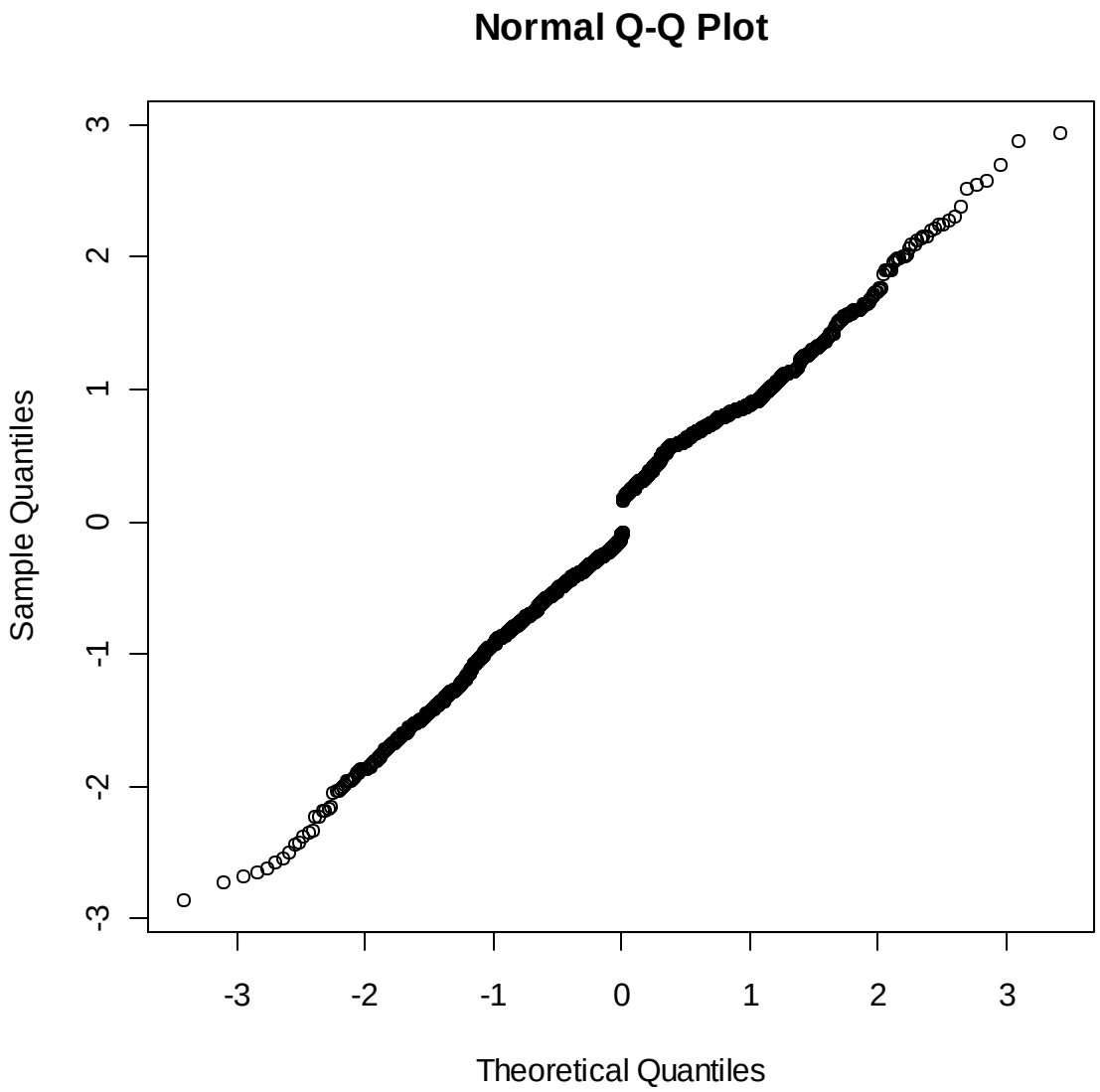
Distance to Wetlands Variables at Mollidgewock





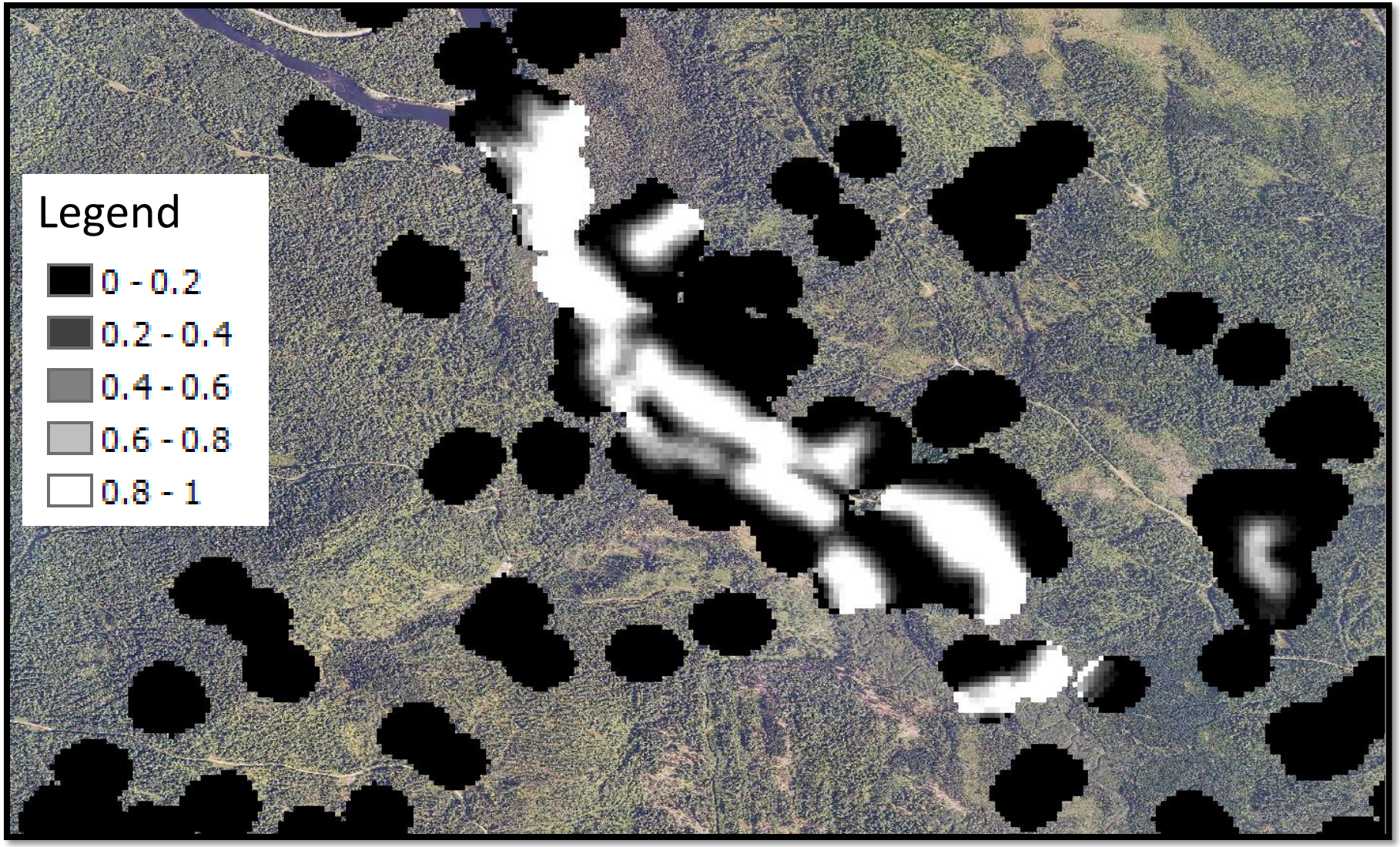






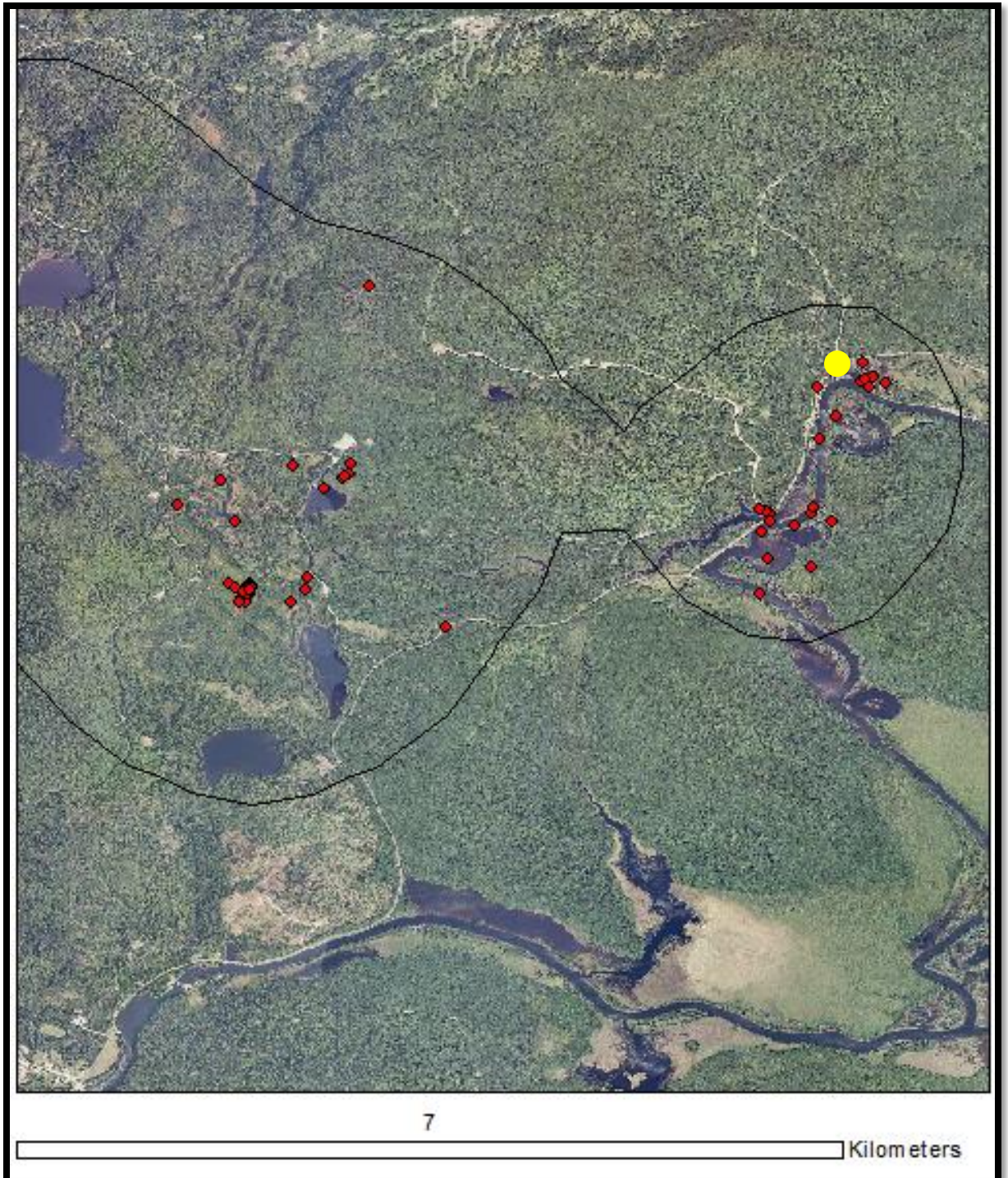
The data distribution matches the theoretical distribution

Proportion of any wetland type at Mollidgewock

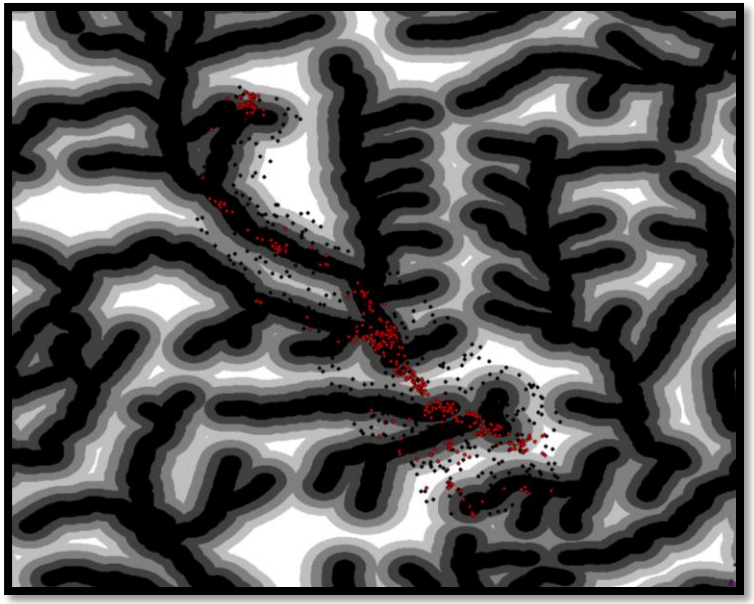


Methods: Spatial Analysis

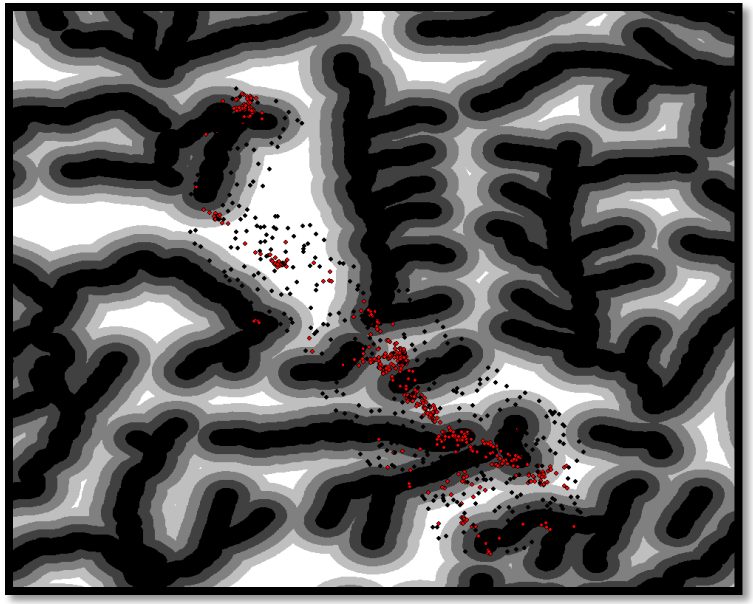
- Calculated mean of presence and random points in a 30 m buffer for each raster layer
- Based on telemetry error
- Extracted values of 14 raster layers to points


7
Kilometers

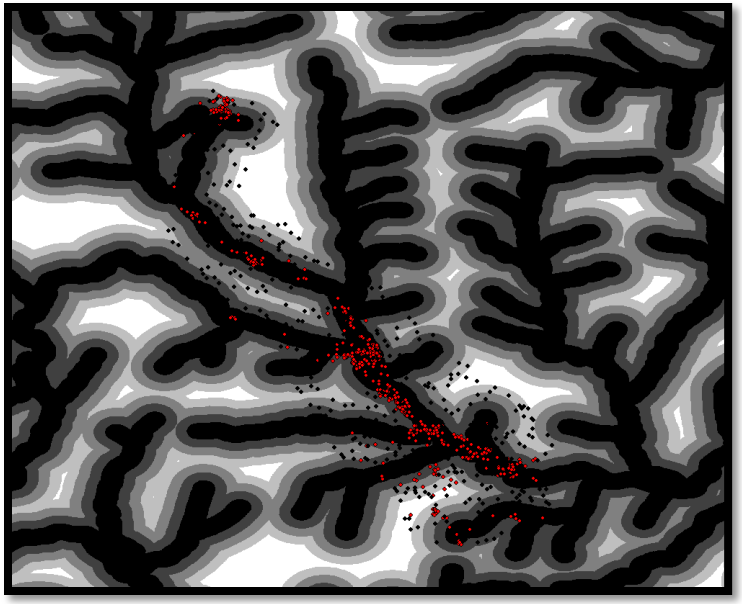
Distance to Stream and River Variables at Swift Diamond



1st, 2nd and 3rd order streams



1st and 2nd order streams

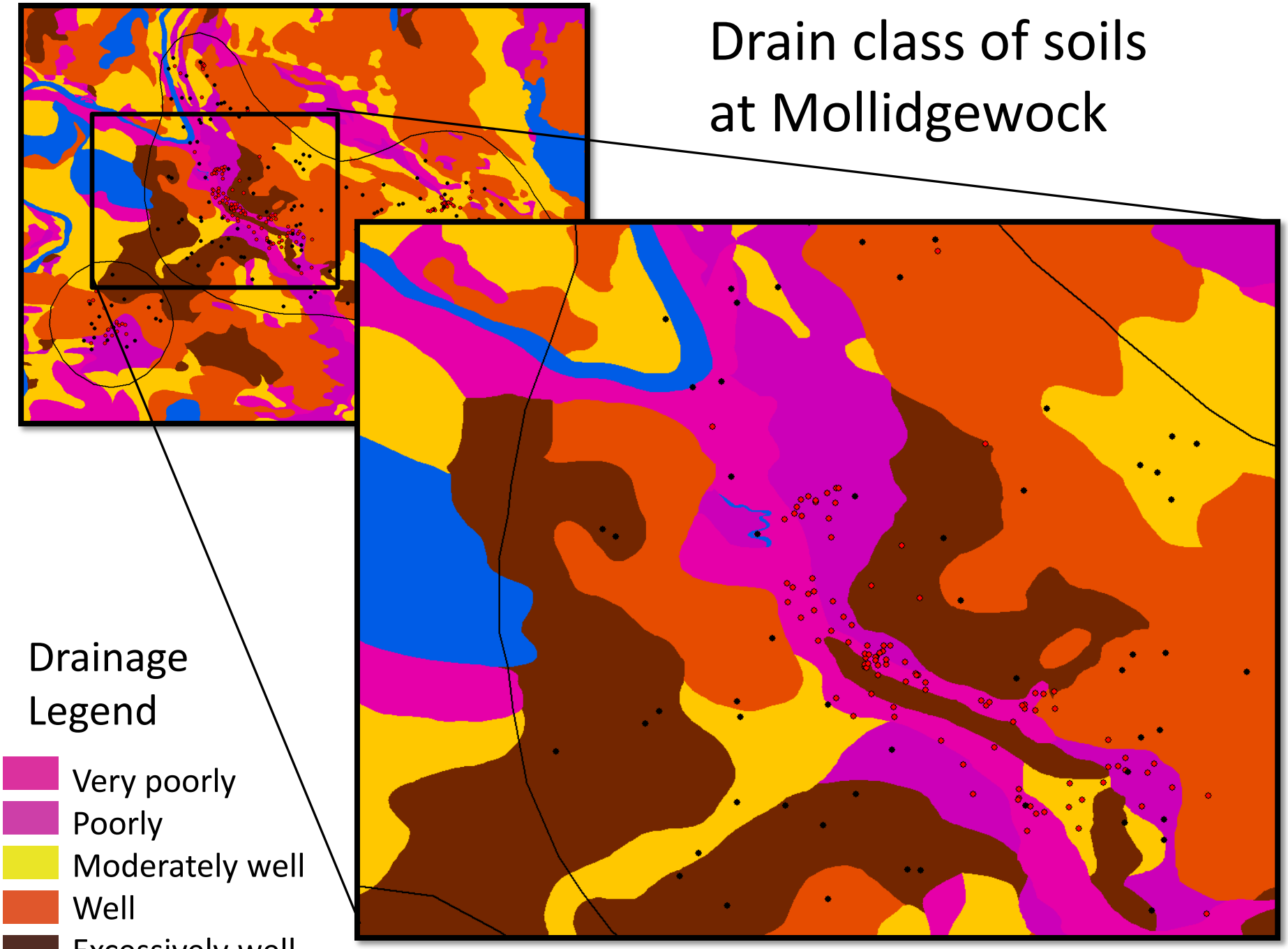


All order streams

Legend

- 0-200m
- 201-400m
- 401-600m
- 601-800m
- >801m

Drain class of soils at Mollidgewock



Drainage Legend

- Very poorly
- Poorly
- Moderately well
- Well
- Excessively well