

Wild goose chase: addressing land use challenges outside the airport fence

David Bradbeer & Prabin Joshi



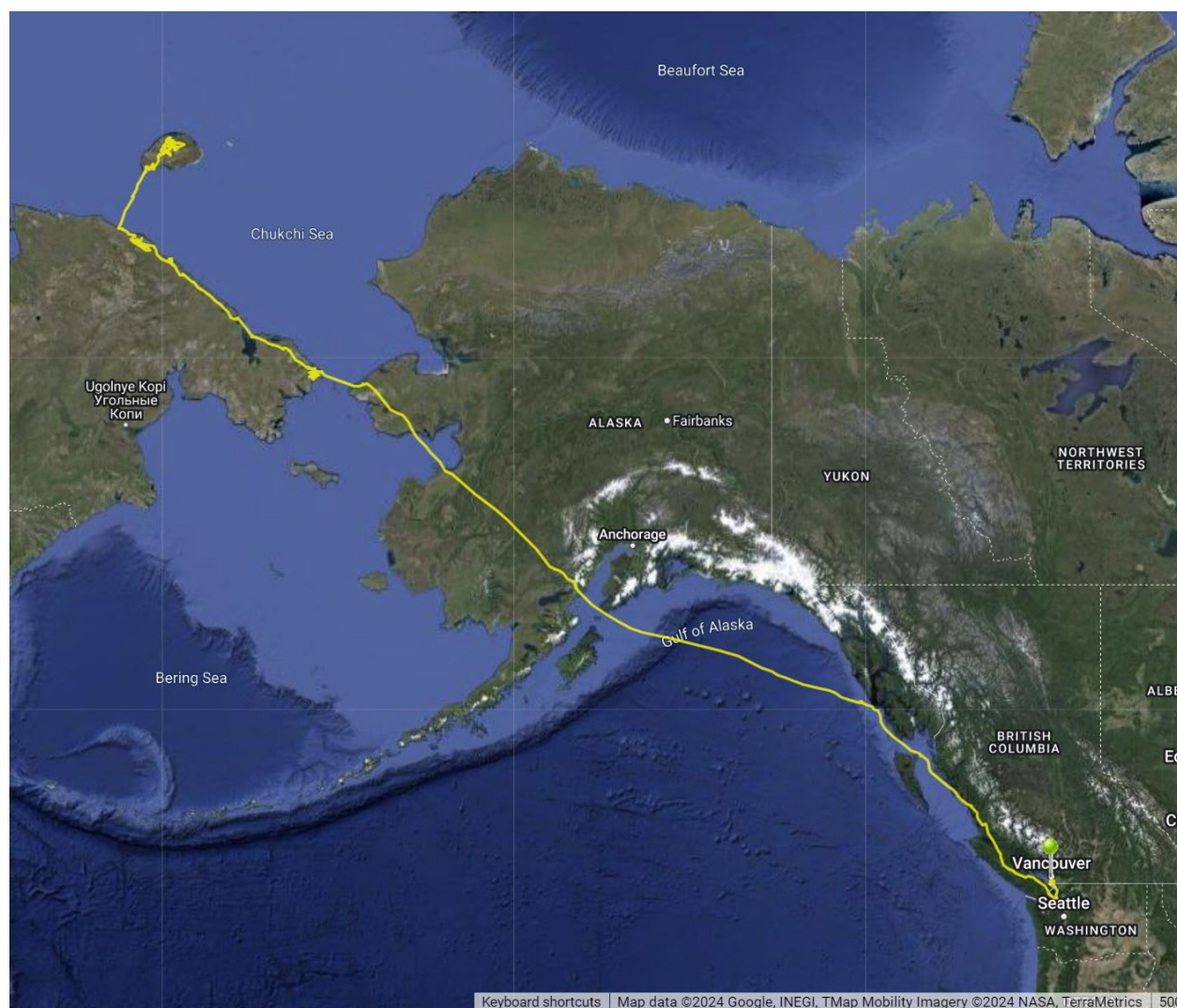


CYVR straddles
terrestrial and
marine
environments

Hybrid-race Canada Geese: urban cobra chicken



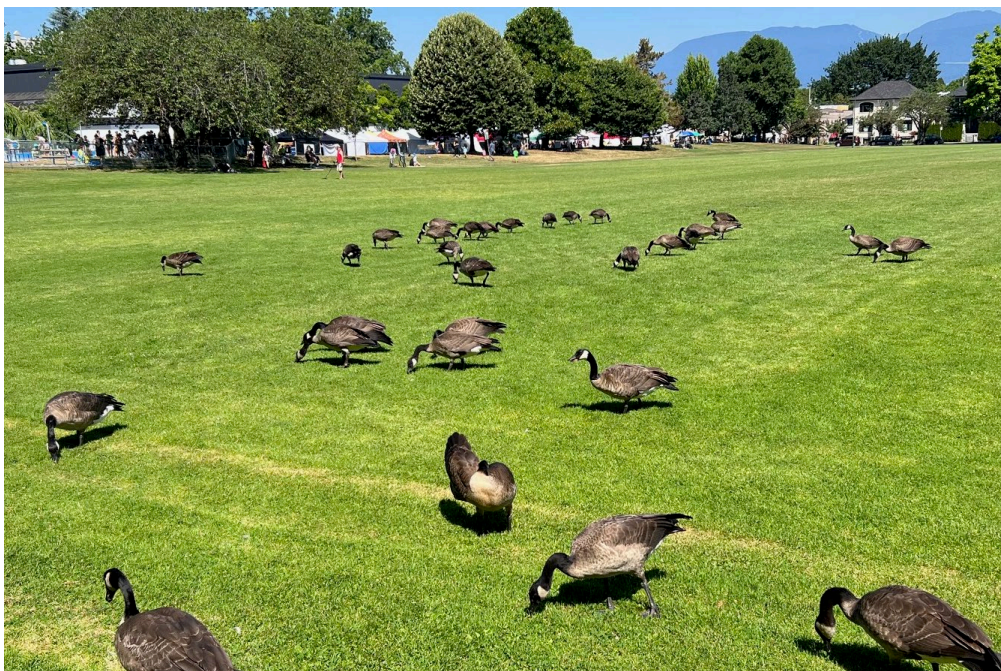
Lesser Snow Geese: arctic breeders





goose foraging ecology

- herbivores
- select protein rich, low fibre plant parts



Heavy billed species grub
underground rhizomes





CONFIDENTIAL - DO NOT DISCLOSE

goose foraging ecology

- amenity turf grass
- agricultural grasses
- crop residue



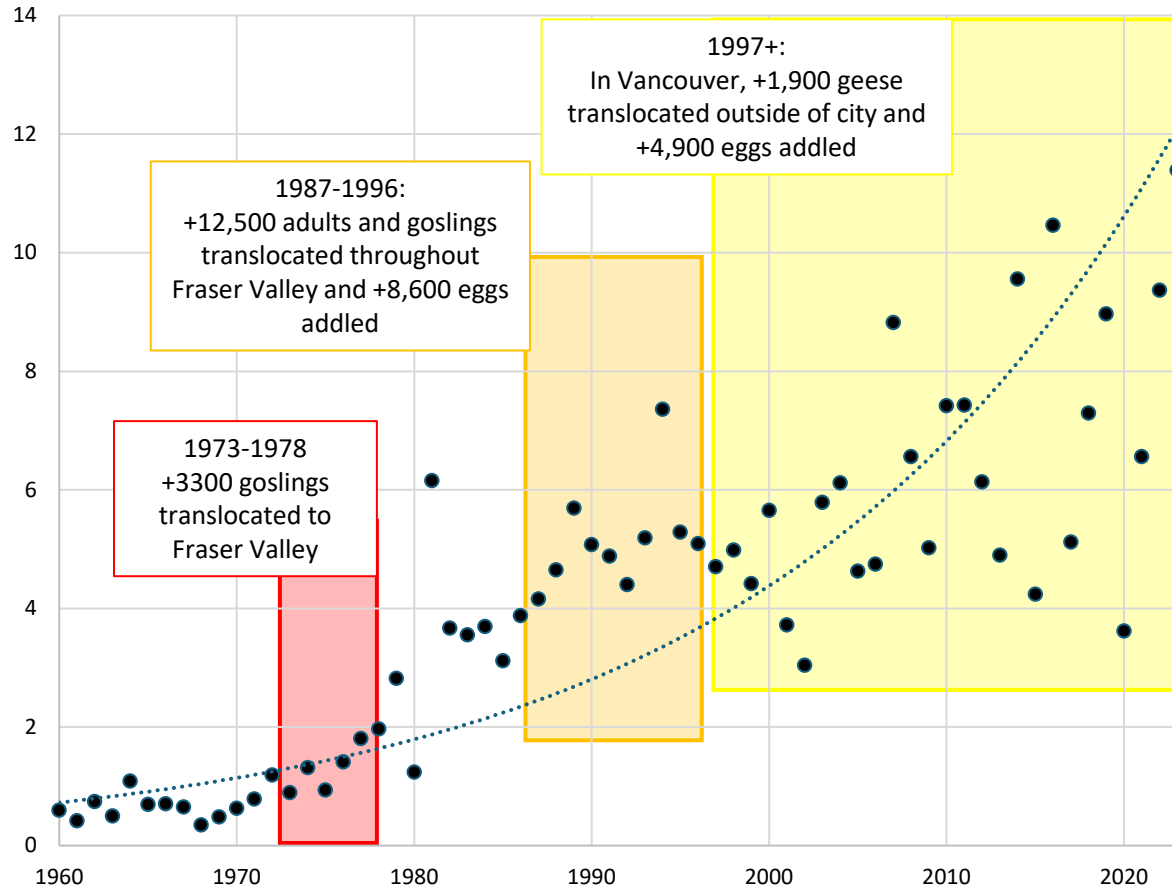
©David Shackleton



Amenity turf grass feeding in Richmond: 2007

Increasing goose populations...

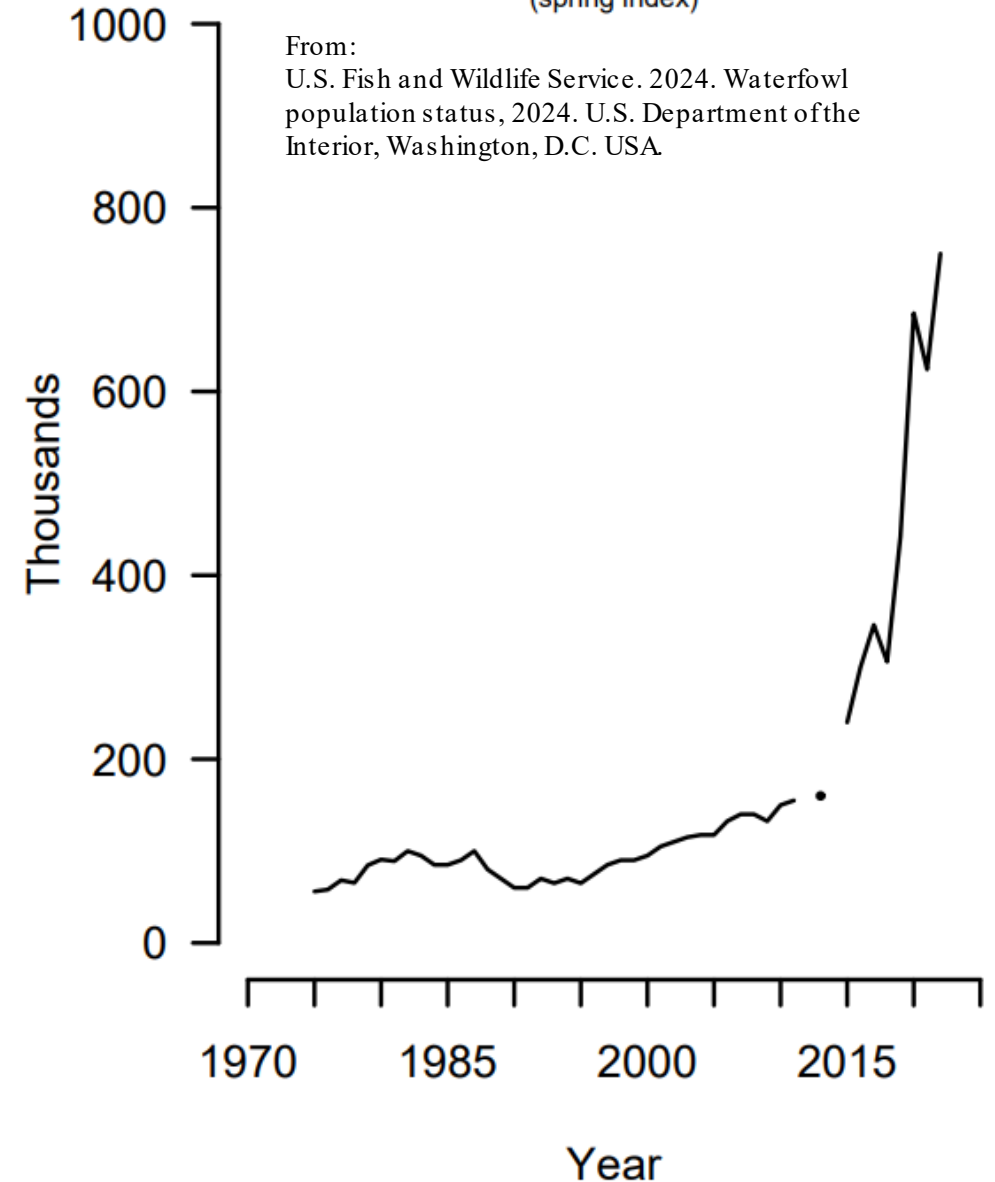
Canada Geese counted per party hour in Vancouver & lower Fraser River estuary, CBC counts, 1960-2023



Adapted from National Audubon Society (2020). The Christmas Bird Count Historical Results [Online]. Available <http://www.christmasbirdcount.org> [your access date] and; Janus, D., W.S. Boyd, & T.G. Martin. 2022. Introduced Canada Geese in the Fraser River Estuary: A Conservation Challenge. UBC Sustainability Hub. University of British Columbia, Vancouver, British Columbia, Canada

Wrangel Island lesser snow goose

(spring index)



Canada Geese

Local population: Nesting

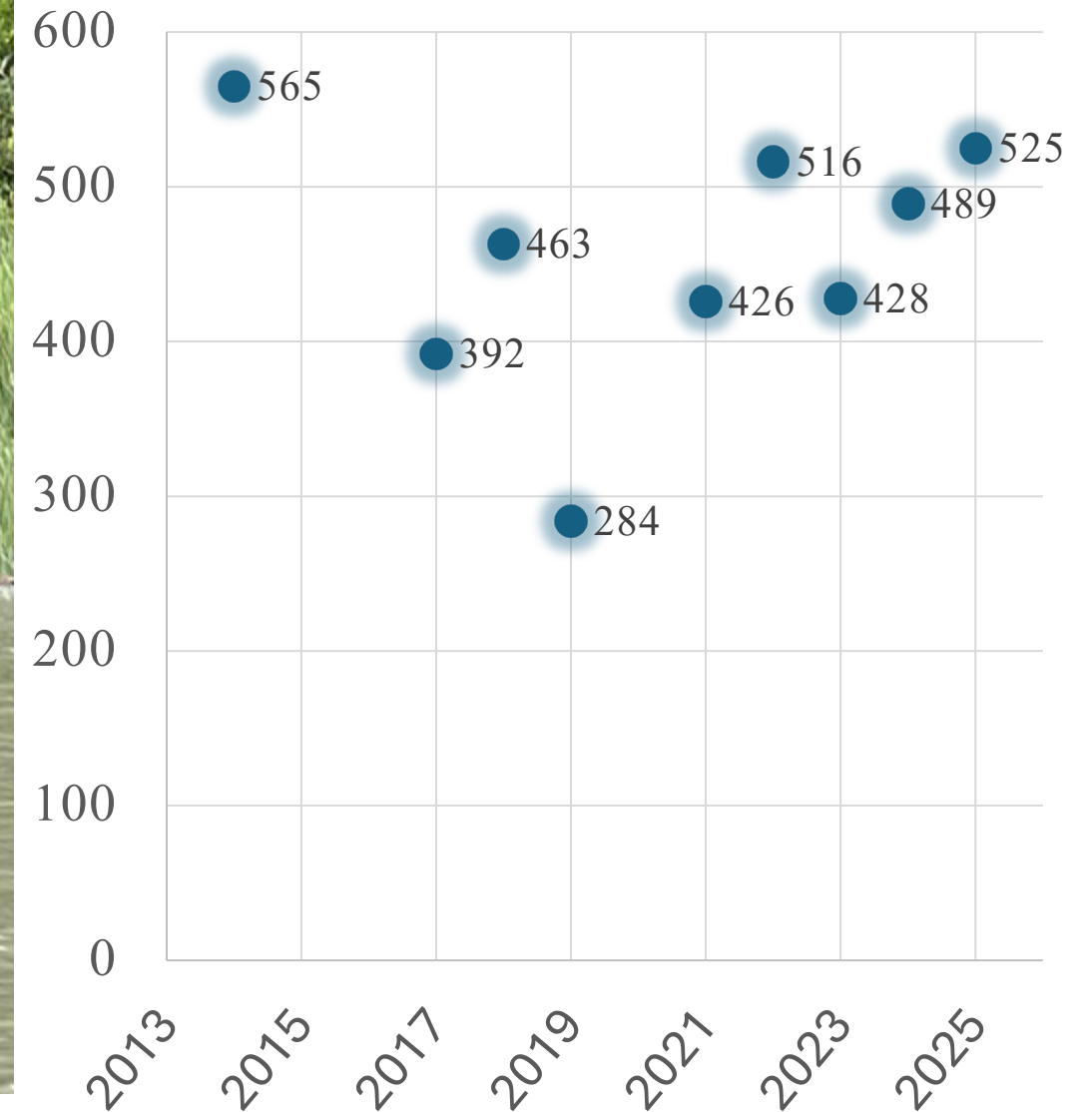
Molting and Molt Survey

- use of marsh habitat



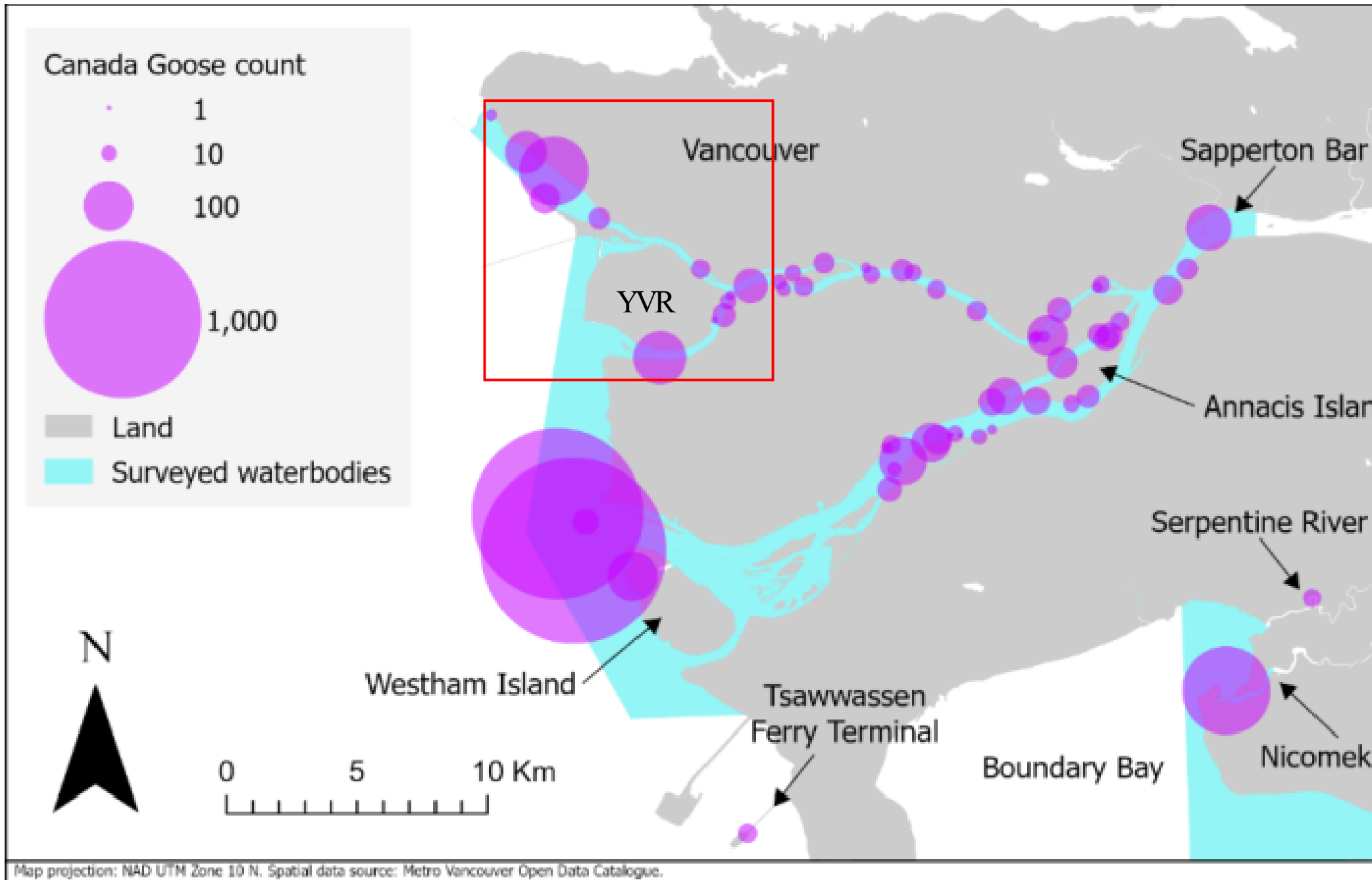


Canada Goose molt survey
results 2014-2025



Canada Goose molting habitat

Janus, D. (2024). Ecological impacts and stewardship opportunities of introduced Canada Goose (*Branta canadensis*) in the Fraser River Estuary (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/24/items/1.0444946>



Molting Canada Geese in the river, feeding on sedge





Marsh Degradation

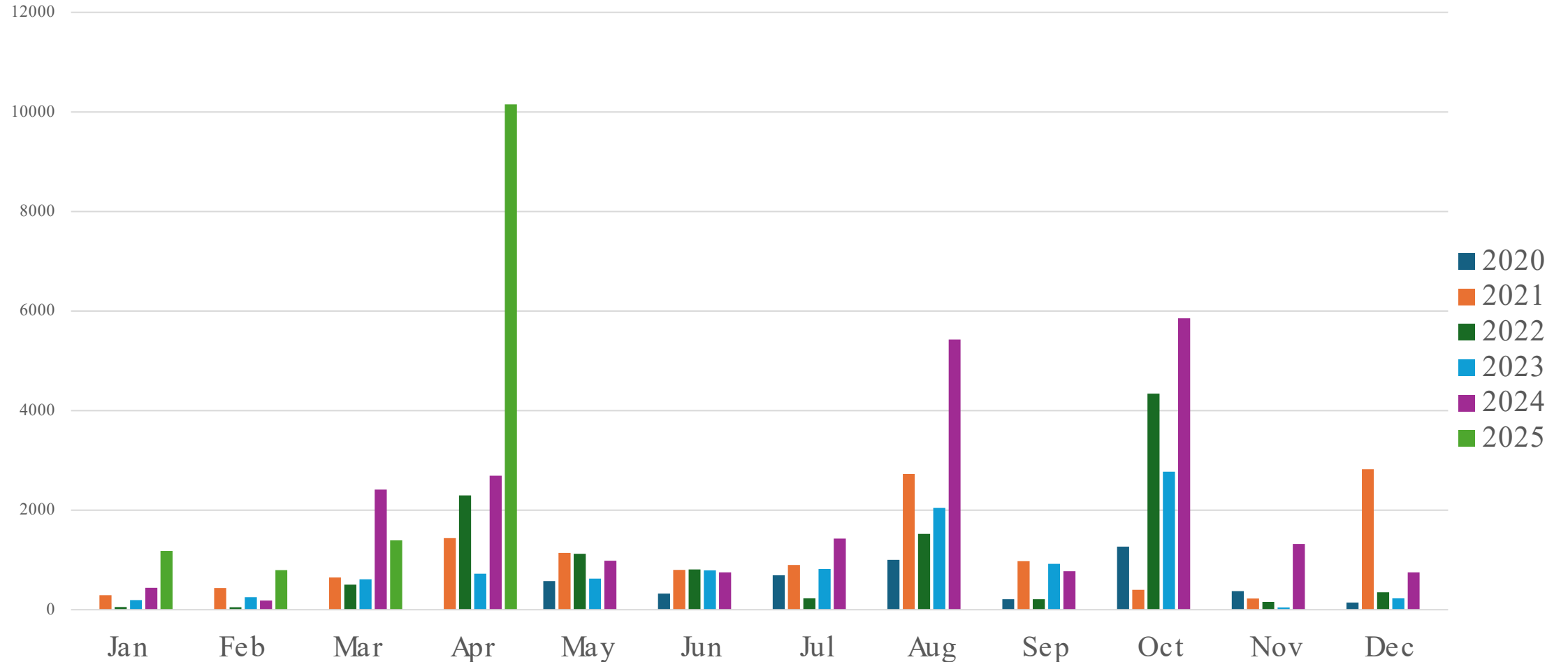


Heavily grazed sedge marsh

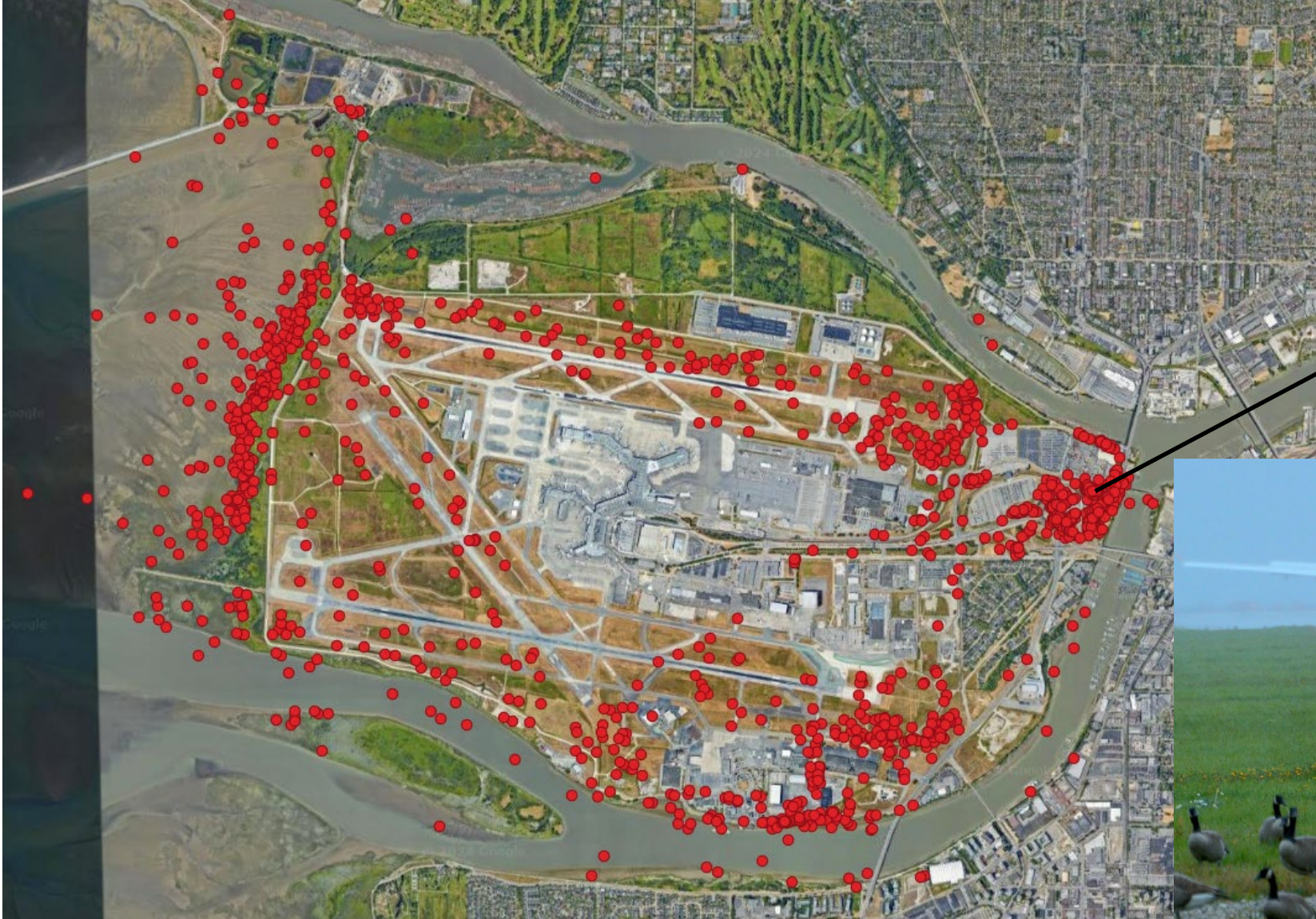
Janus, D., W.S. Boyd, & T.G. Martin. 2022.
Introduced Canada Geese in the Fraser
River Estuary: A Conservation Challenge.
UBC Sustainability Hub. University of
British Columbia, Vancouver, British
Columbia, Canada.

© Dominic Janus

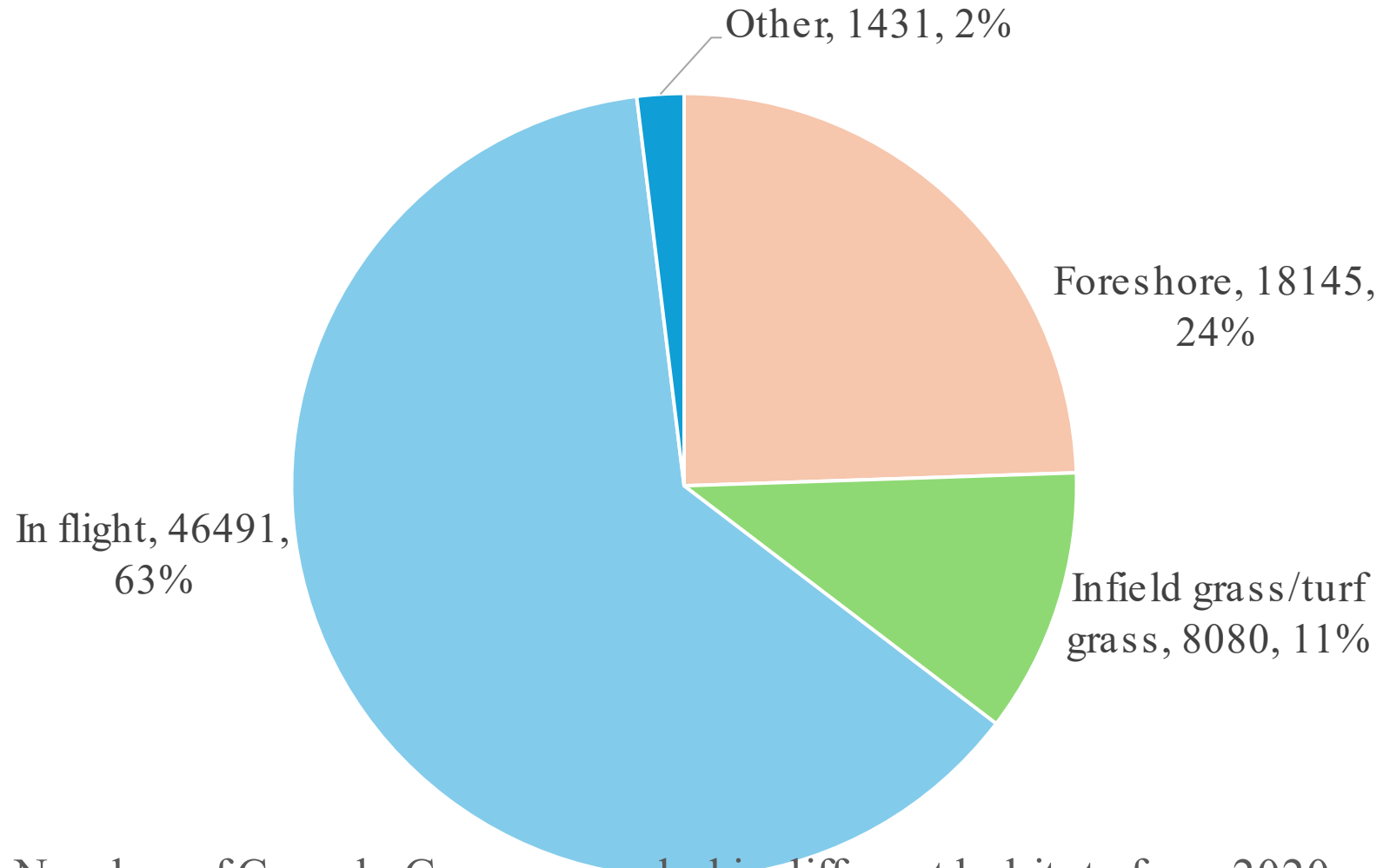
Canada Goose encounters include monthly data 2020-2025



Distribution of Canada Geese: spotted on the ground (2020-2025)



Habitats used by Canada Geese



Number of Canada Geese recorded in different habitats from 2020-2025

Distribution of Canada Geese: spotted in flight (2020-2025)

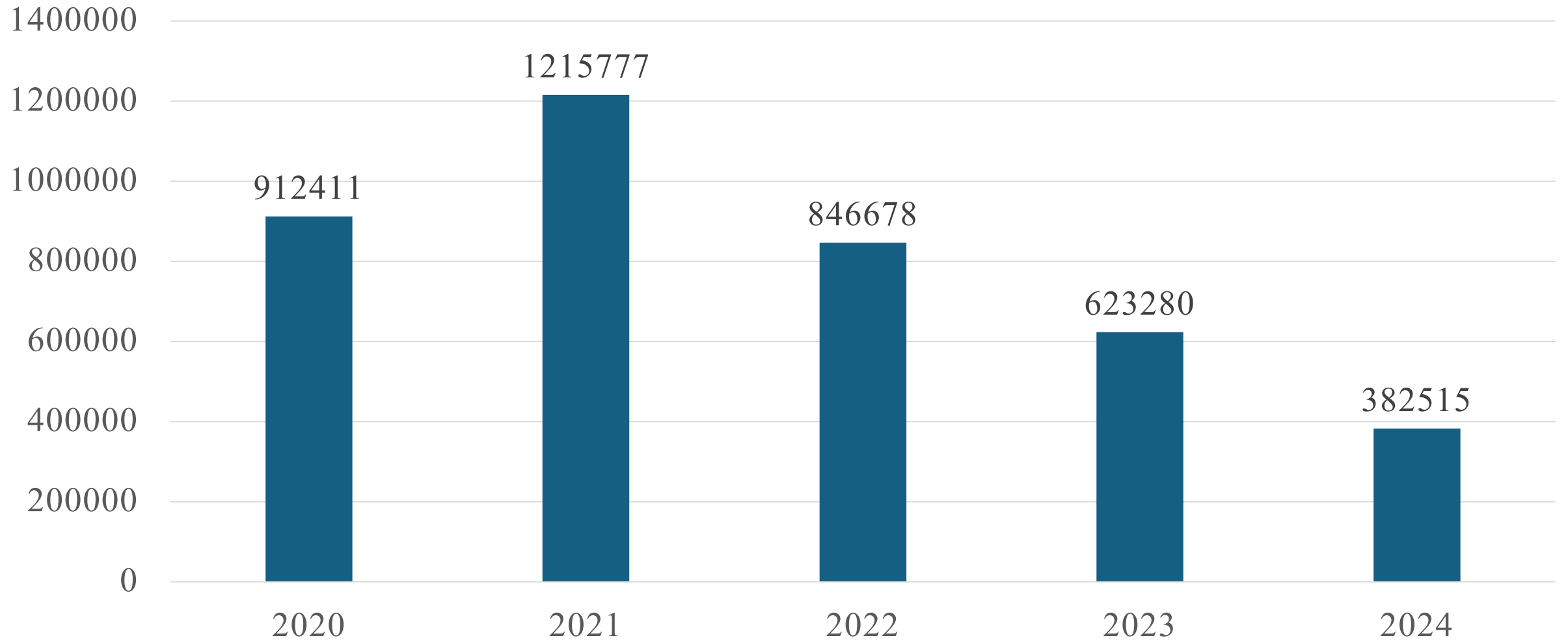


Snow Goose

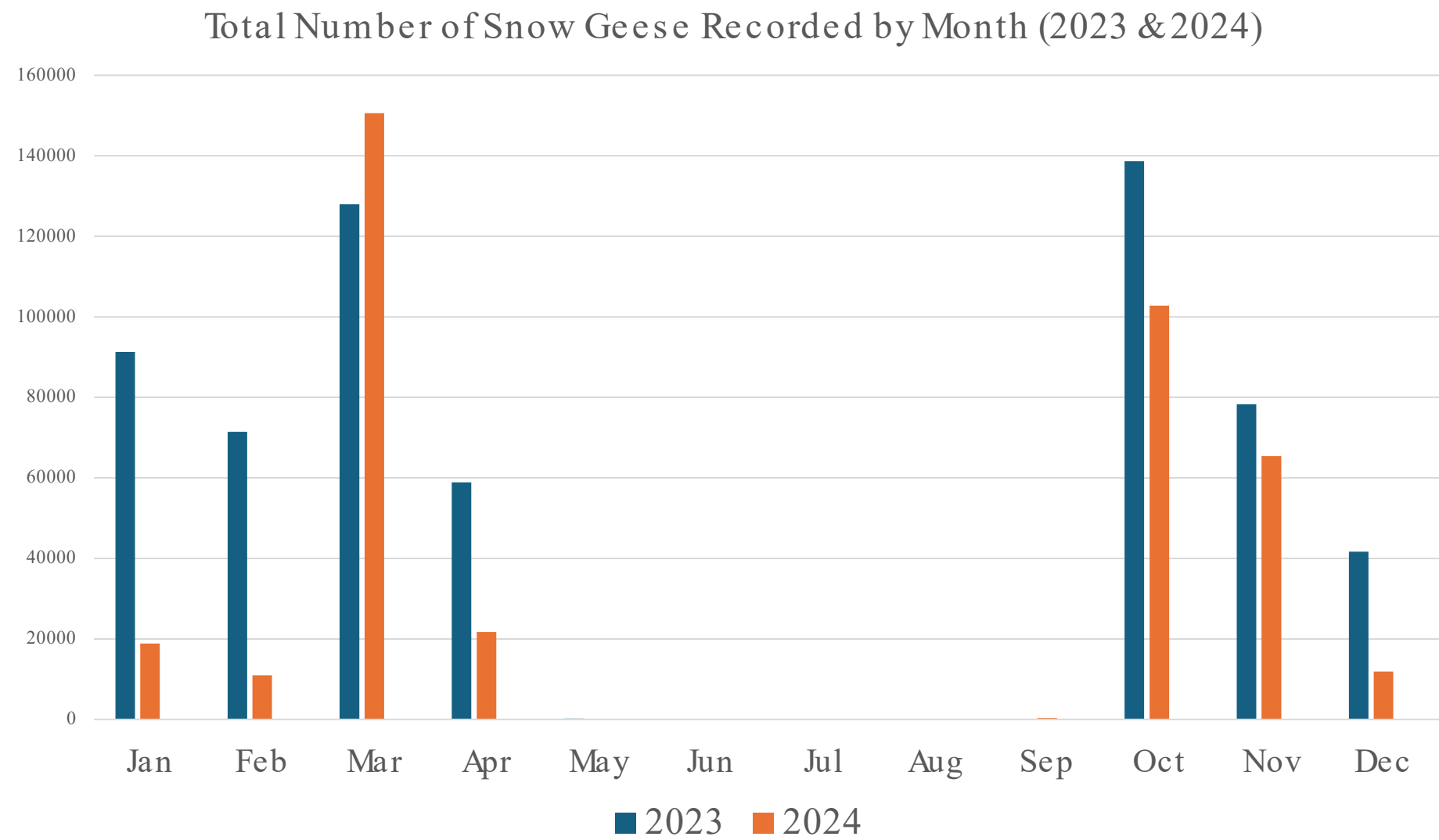


Snow Goose encountered

Total number of Snow Geese recorded by Year 2020-2024



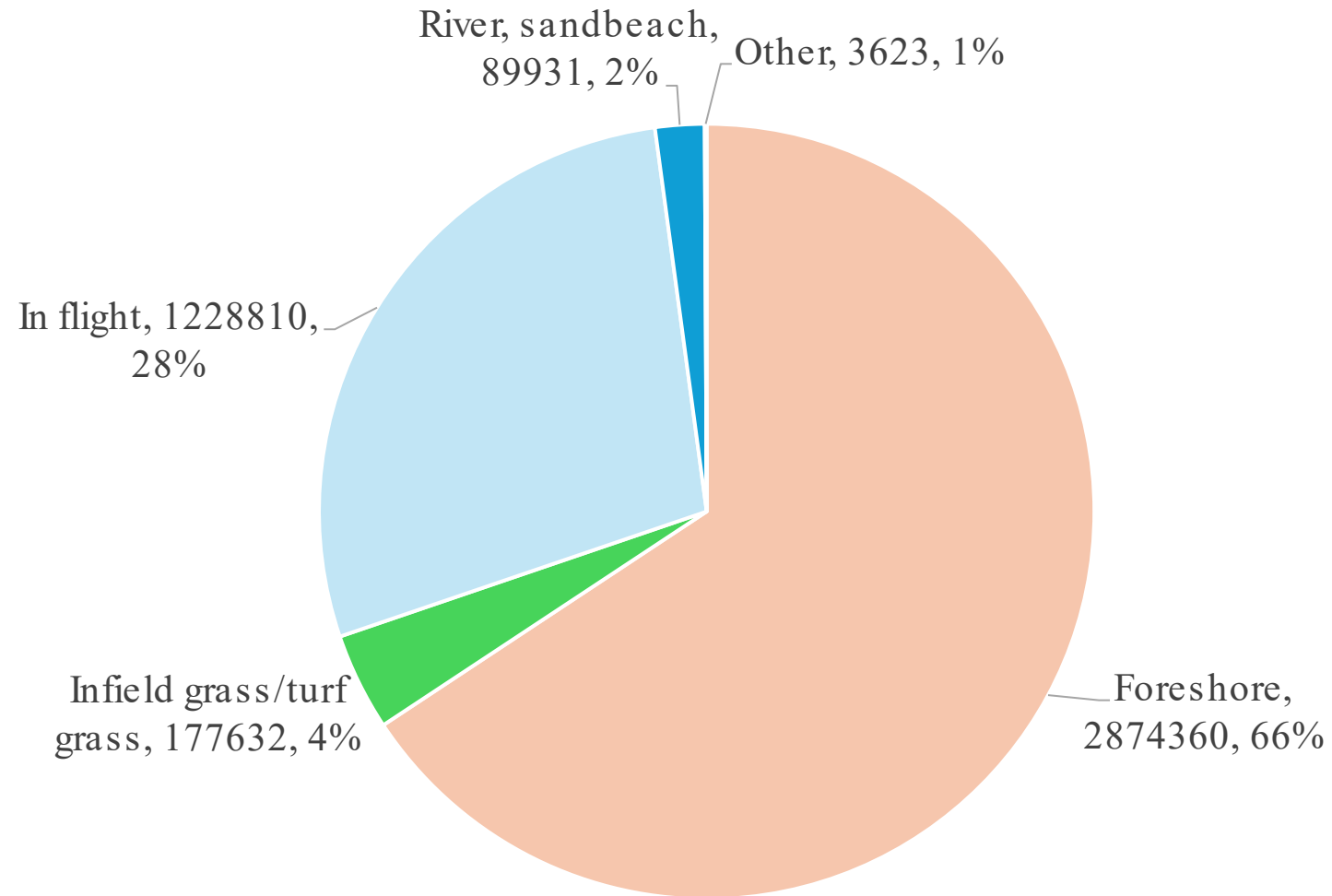
Snow Geese abundance by month



Distribution of
Snow Geese:
spotted on the
ground (2020-
2025)

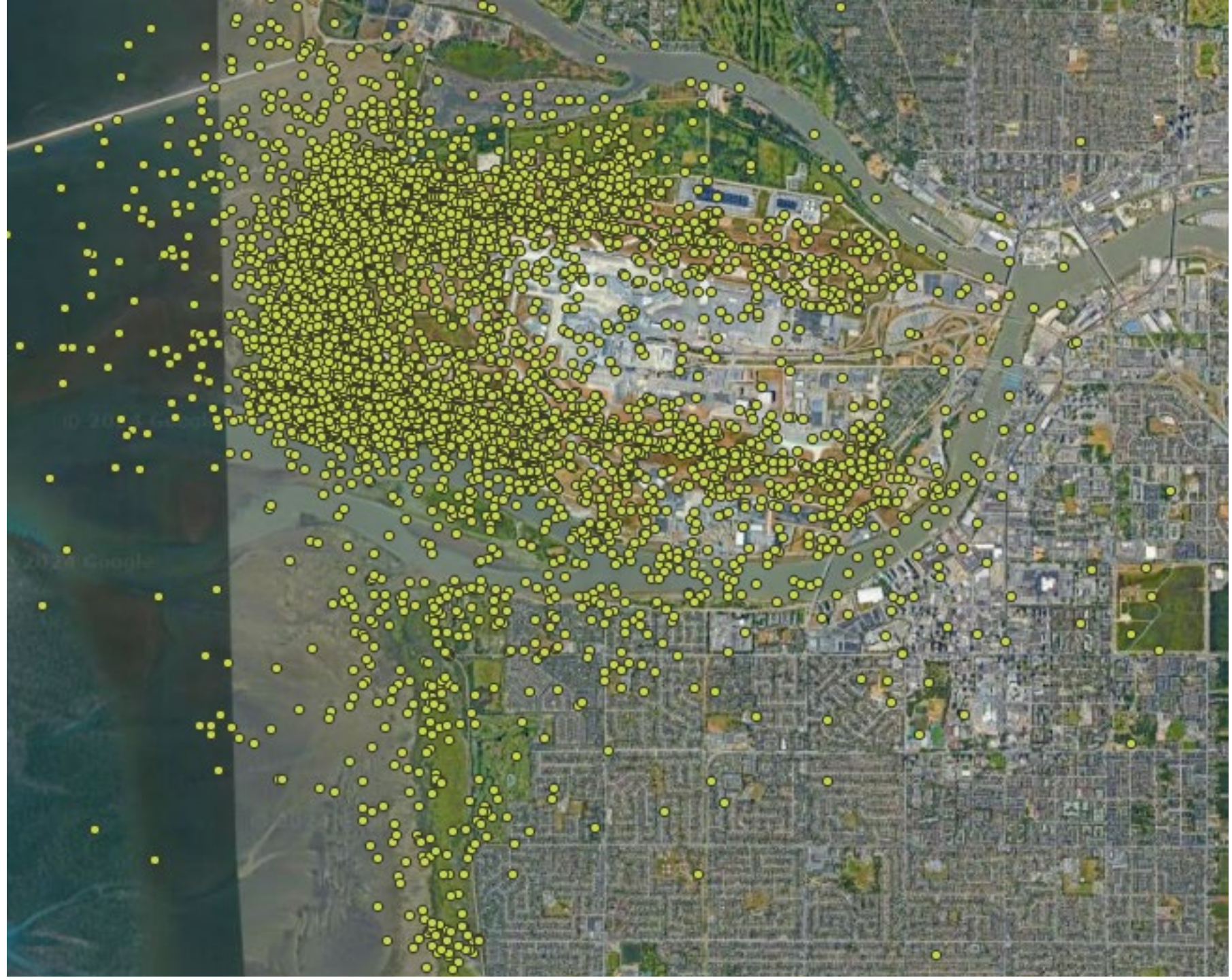


Distribution of Snow Geese

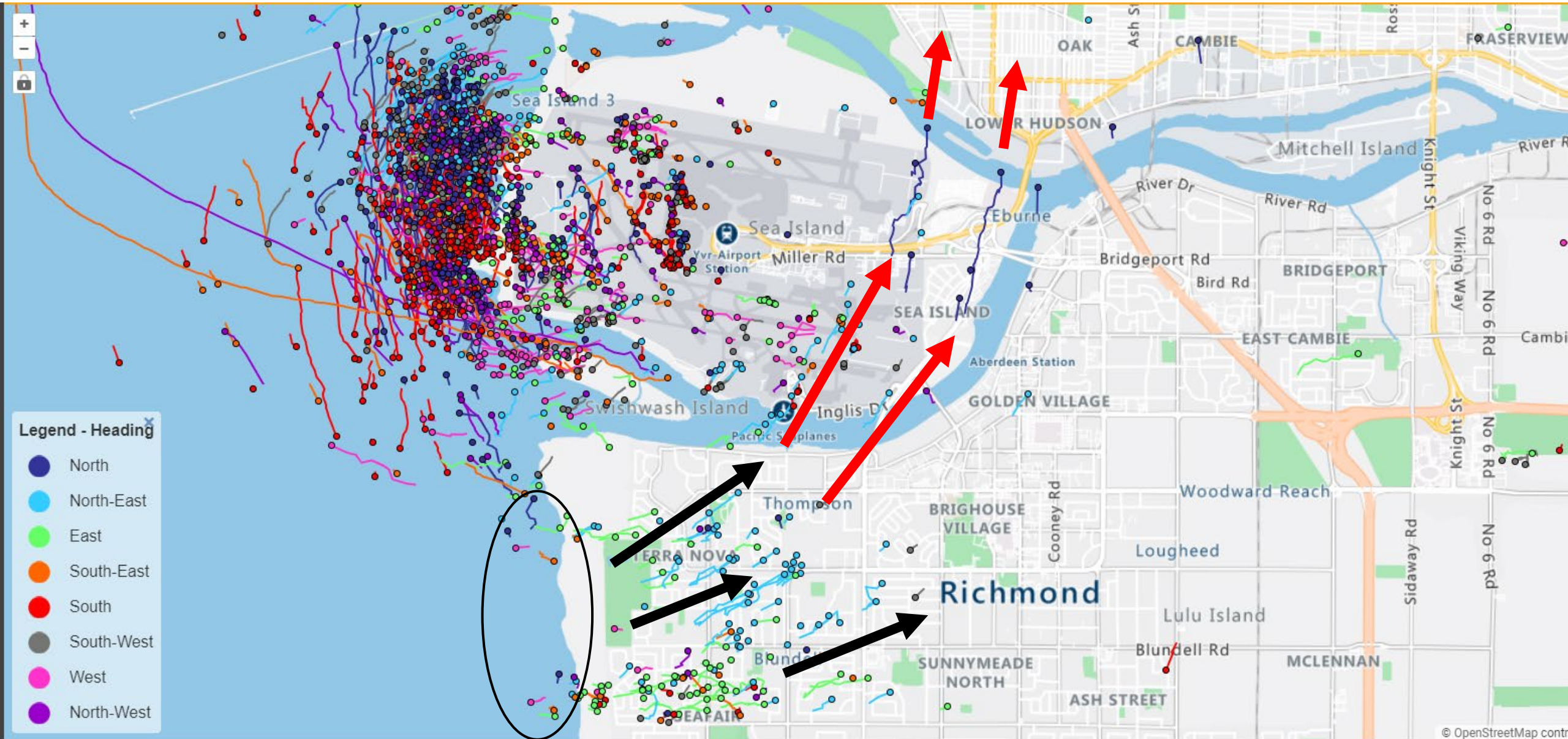


No. of SNGO recorded in different habitat types during 2020-2025

Distribution of Snow Geese: spotted in flight (2020-2025)



Snow Geese commute from estuary to inland turf grass



Showing 2352 tracks between 1/20/25, 6:30 PM and 1/20/25, 8:30 PM







A large flock of geese is captured in flight, forming a distinct V-shape against a twilight sky. The sky transitions from a deep orange near the horizon to a pale blue at the top. In the foreground, the silhouettes of tall evergreen trees and several streetlights are visible. A building with a large, arched glass entrance is partially illuminated in the lower left. The overall scene is a serene yet dynamic depiction of wildlife in an urban or semi-urban environment.

Large Flock ~ 1,000 Geese

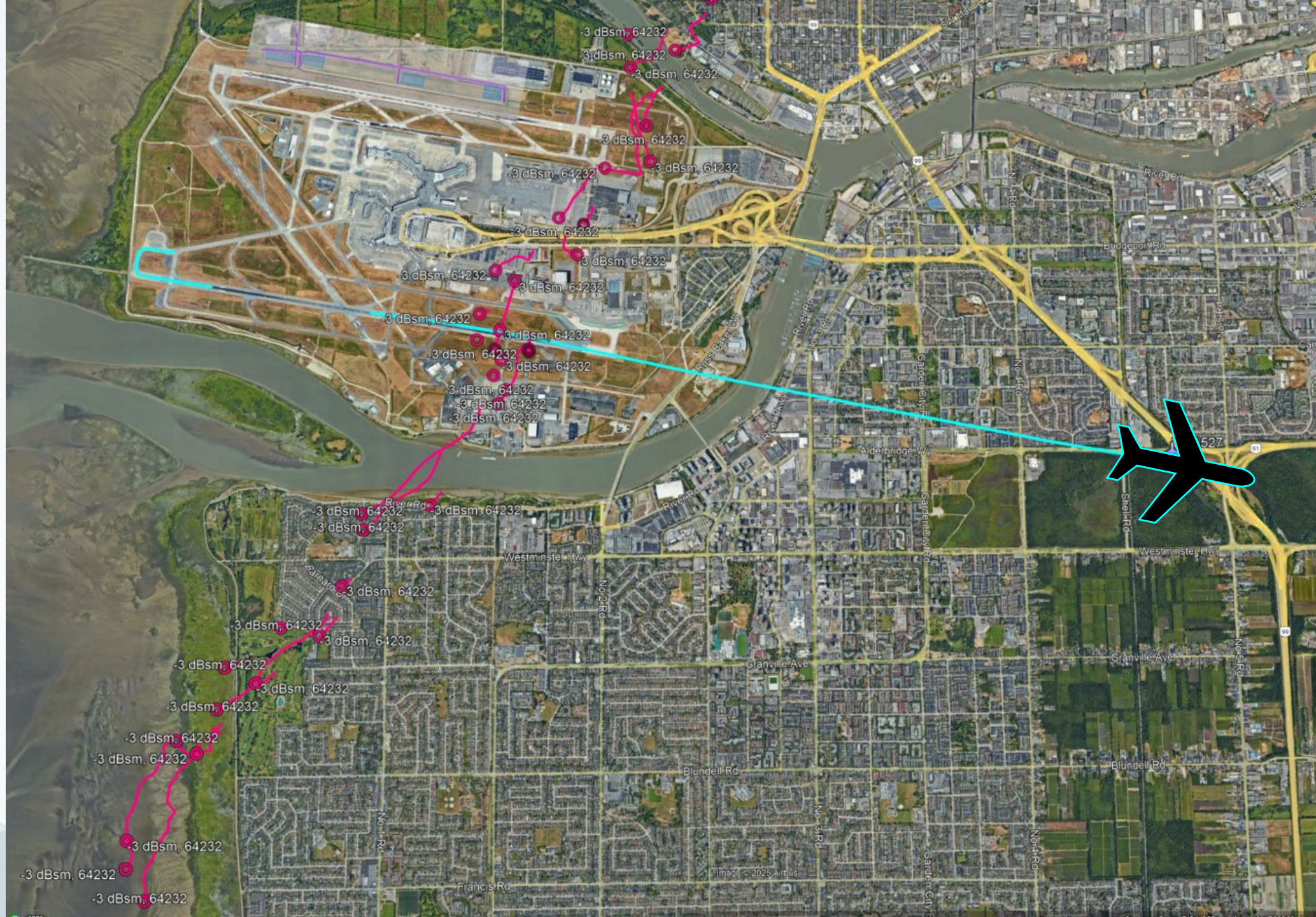


~800 Geese

~600 Geese

Near Miss: 29 Jan 2025 @ 0710

29 Jan 2025
0710
Near Miss



Conclusion

- So, here lies the challenge: both Snow Geese and Canada Geese not only fly over the airport but also make use of the various natural and man-made habitats surrounding it. The key question now is:
- What can we do to address this issue?

We know what geese are looking for on the landscape.

Can we:
enact change of existing
land uses?

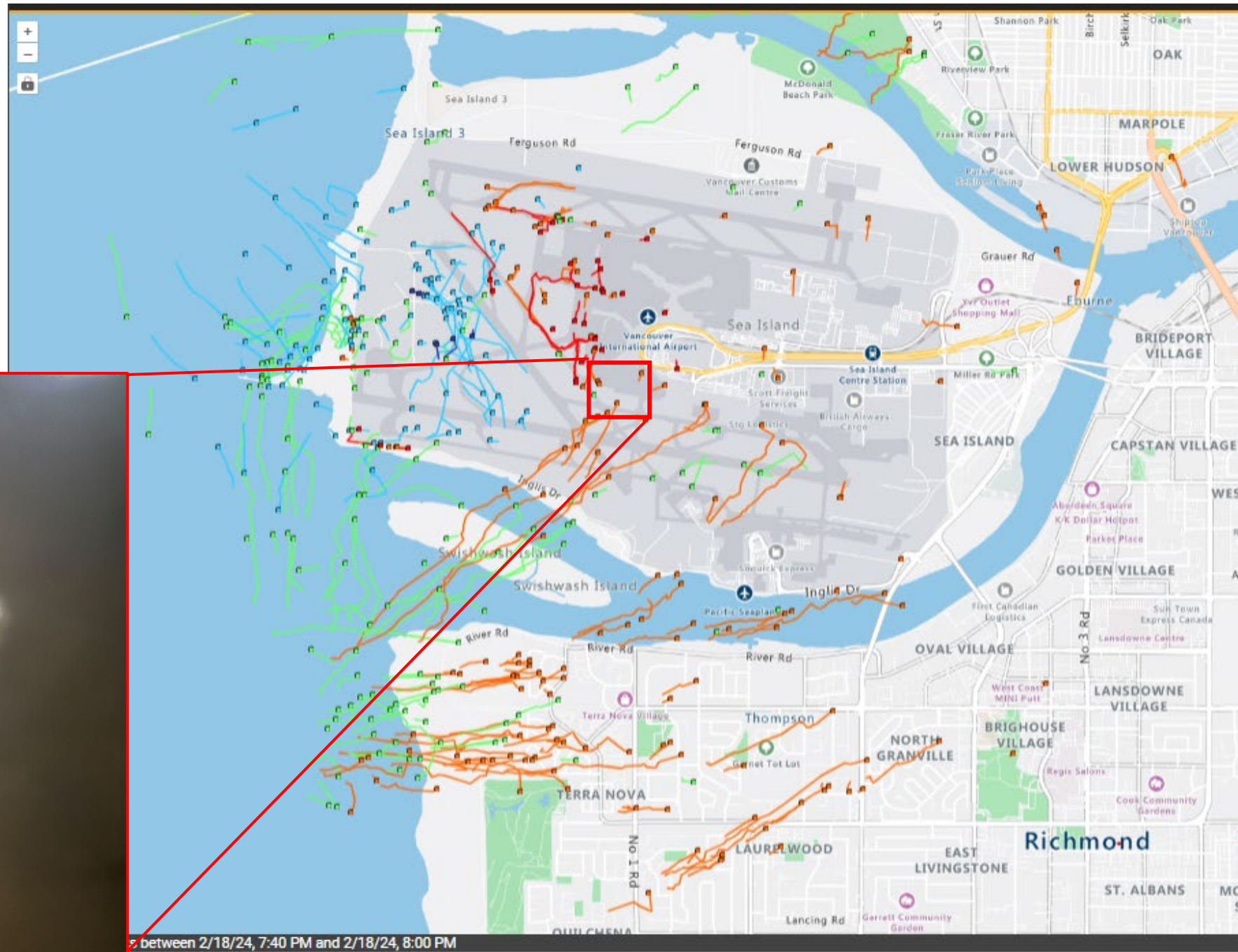
prevent future land use
changes that
INCREASE hazard bird
abundance/behaviour?



The airport doesn't manage the land outside the fence:
Need to engage external stakeholders



Achieving a
common
understanding of
wildlife hazards:
sharing data



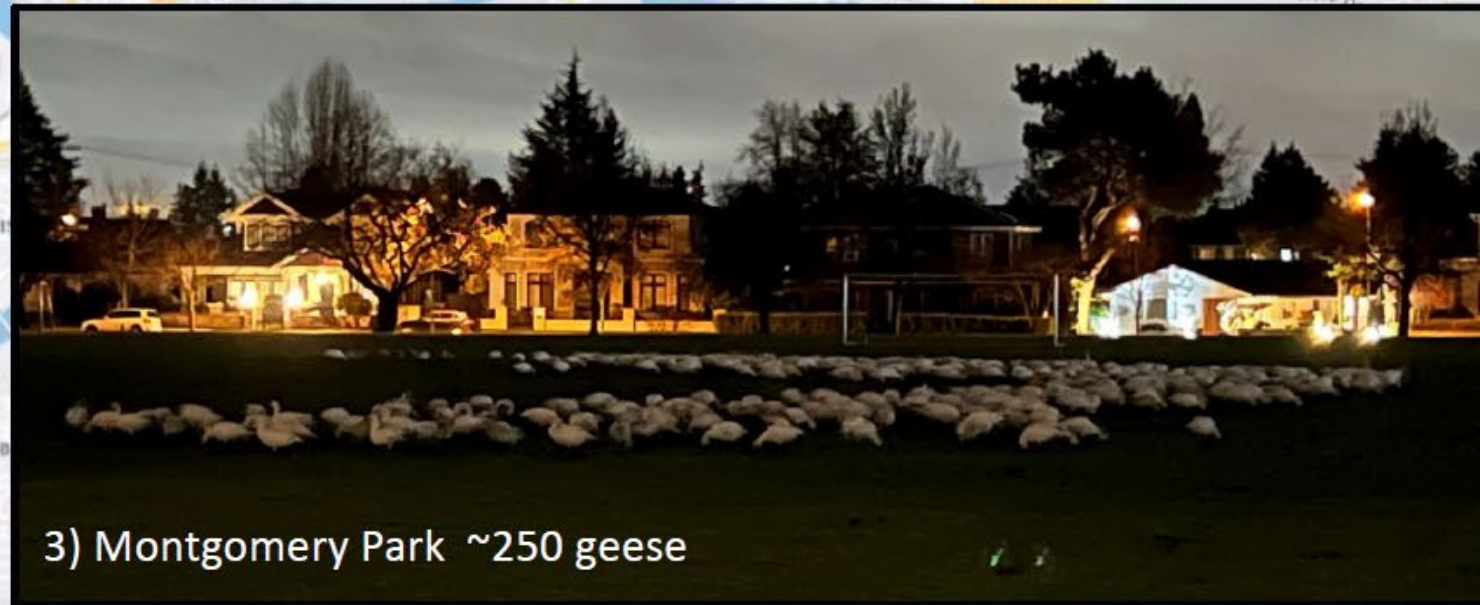
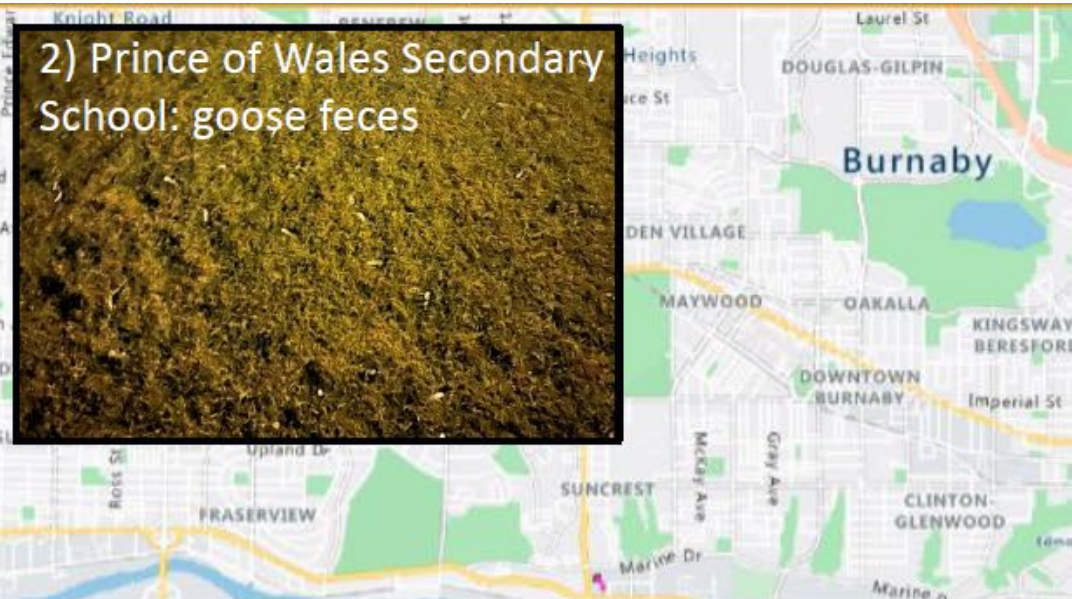
Achieving a common understanding of hazards ... picture help





1) Trafalgar Park ~250 geese

2) Prince of Wales Secondary School: goose feces



3) Montgomery Park ~250 geese

Legend - Heading

- North
- North-East
- East
- South-East
- South
- South-West
- West
- North-West

Showing 1505 tracks between 3/7/25, 6:00 AM and 3/7/25, 6:25 AM

How do we enact change on existing land uses?



Canadian Airport Zoning Regulations

A tool for
mitigating
the risk of
changing
land uses?

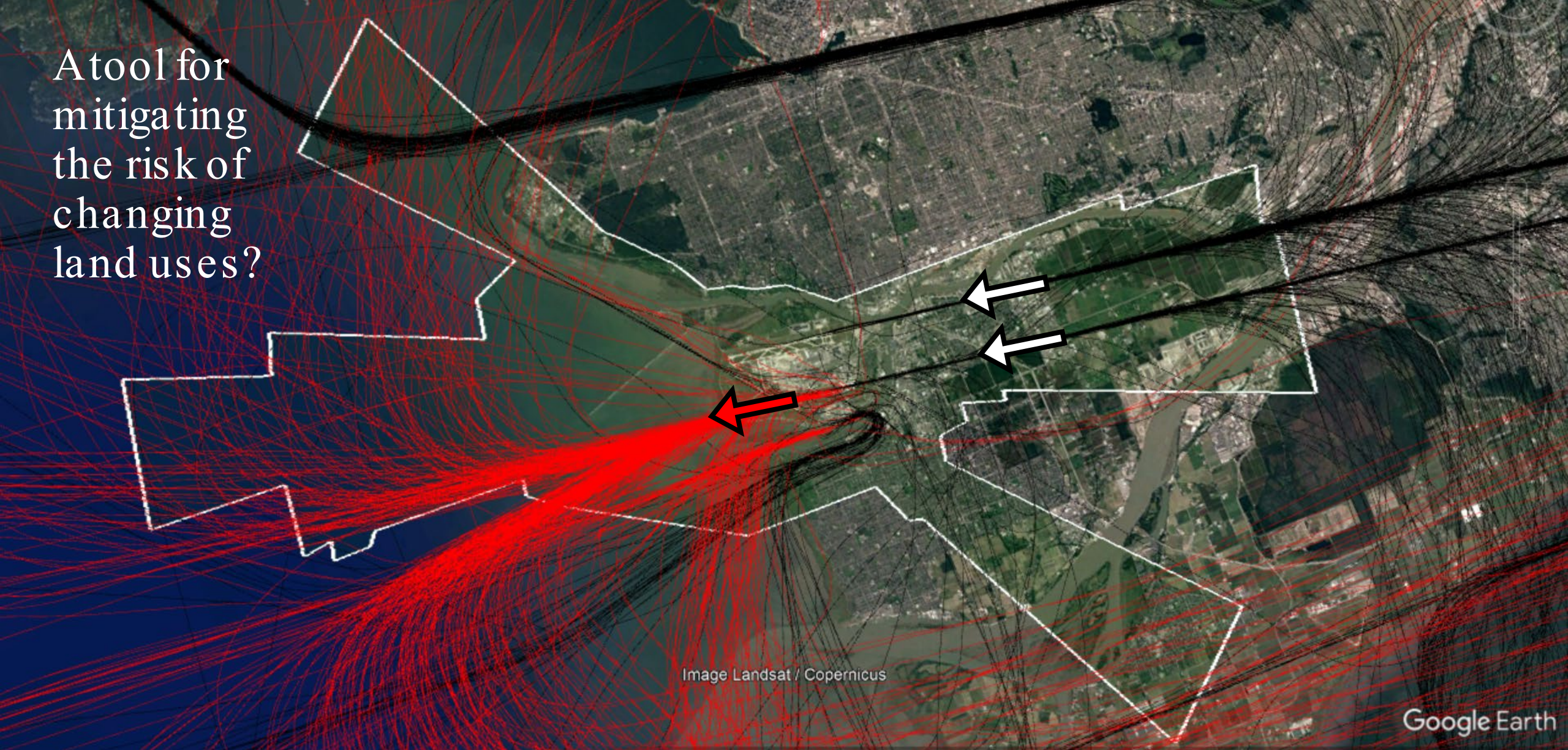


Image Landsat / Copernicus

Google Earth

Current AZR

Disposal of Waste

No [person] ...
shall permit such
land ... to be **used
for the disposal
or accumulation ...
of any waste
material ... edible
by or attractive
to birds.**

No owner or occupier of any land or land under water
to which these Regulations apply shall permit such
land or any part thereof to be **used for the disposal
or accumulation** thereon of any **waste material** or
substance **edible by or attractive to birds.**



Proposed AZR

WILDLIFE HAZARD

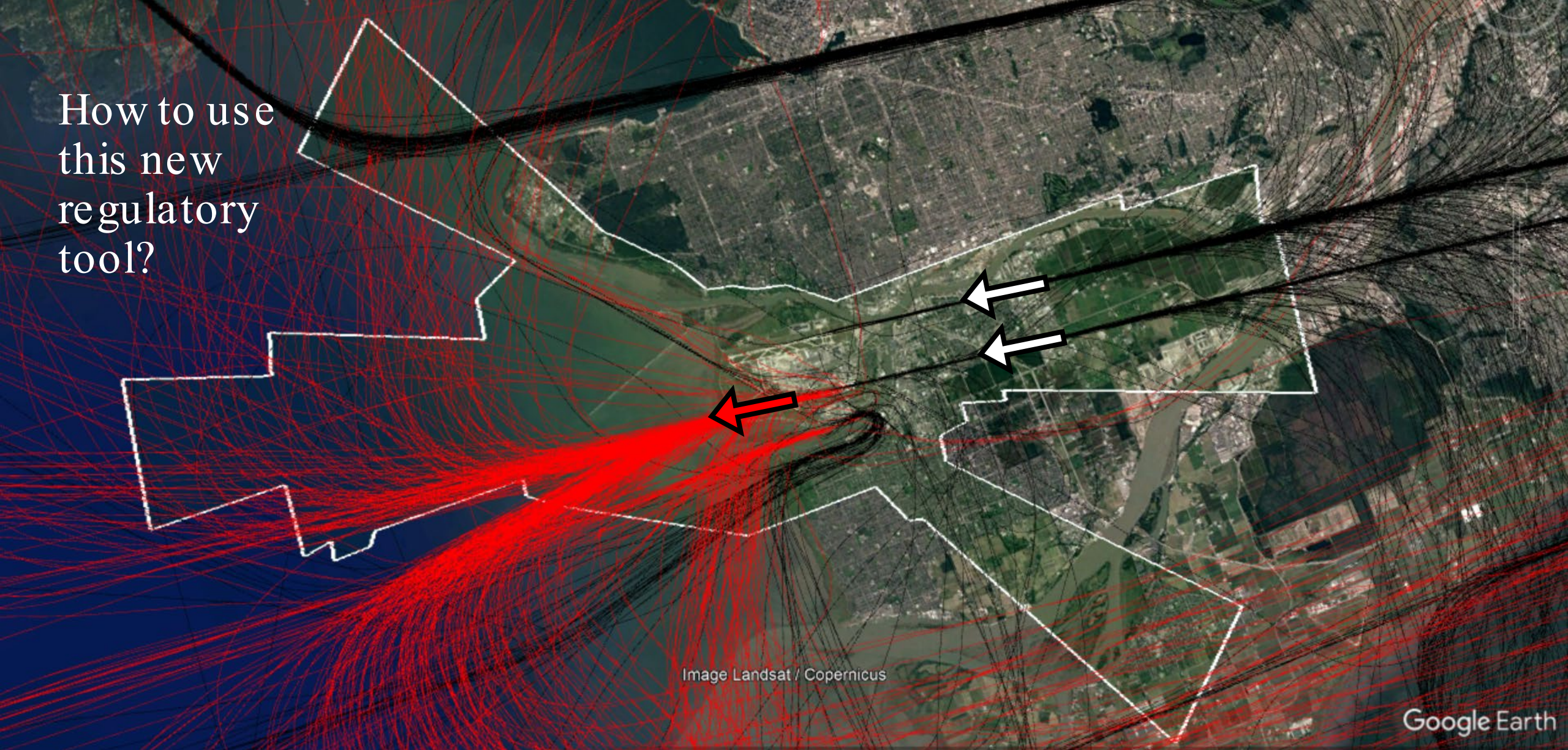
1. A person **must not use**, or permit another person to use, any of the lands in respect of which these Regulations apply **for activities or uses that attract wildlife** – particularly birds – **that may create a hazard for aviation safety.**

Canadian Airport Zoning Regulations

How to use
this new
regulatory
tool?

Image Landsat / Copernicus

Google Earth



A satellite map of a coastal region, likely the Chesapeake Bay area, showing land, water, and urban areas. A dense network of red lines is overlaid on the map, representing a complex spatial analysis or data layer. Three cyan arrows point from a common origin in the lower center towards three red dots located in the upper center of the map. The text 'AZR not a silver bullet...' is in the bottom left, and 'Image Landsat / Copernicus' is in the bottom center.

AZR not a silver bullet...

Image Landsat / Copernicus

Go


Close all the existing turf grass parks attracting Snow Geese within the AZR?



Section 5.4(4) Aeronautics Act contains the Grandfathering Provision:

Regulation does not apply to existing land uses.

"5.4(4) No zoning regulation shall apply to or in respect of a use of land, buildings, structures or objects or a building, structure or object that, on the day on which the zoning regulation comes into force, exists as a use, building, structure or object that does not conform to the zoning regulation."

An aerial photograph showing a wide river flowing through a landscape. On the left bank, there are large, flat, brownish areas, possibly agricultural or undeveloped land, with some roads and a few buildings. On the right bank, there is a dense urban area with many buildings, parking lots, and streets. A bridge crosses the river in the middle of the image. The sky is not visible.

AZR only applies to new
land uses/activities

Image © 2025 Vexcel Imaging US, Inc.

Google Earth

1985

Imagery Date: 6/11/2024 lat 49.186522° lon -123.158476° elev 0 ft eye alt 6270 ft



Image © 2025 Vexxel Imaging US, Inc.

Google Earth

1985

Imagery Date: 6/11/2024 lat 49.179297° lon -123.144988° elev 0 ft eye alt 6270 ft

The general language of the AZR may make stakeholders defensive...

WILDLIFE HAZARD

1. A person **must not use**, or permit another person to use, any of the lands in respect of which these Regulations apply **for activities or uses that attract wildlife** – particularly birds – **that may create a hazard for aviation safety.**



Cities are adopting biodiversity strategies, focused on birds



VILLE AMIE DES OISEAUX
BIRD FRIENDLY CITY

NatureCanada.ca/BFC

Regional focus
on sedge marsh
restoration





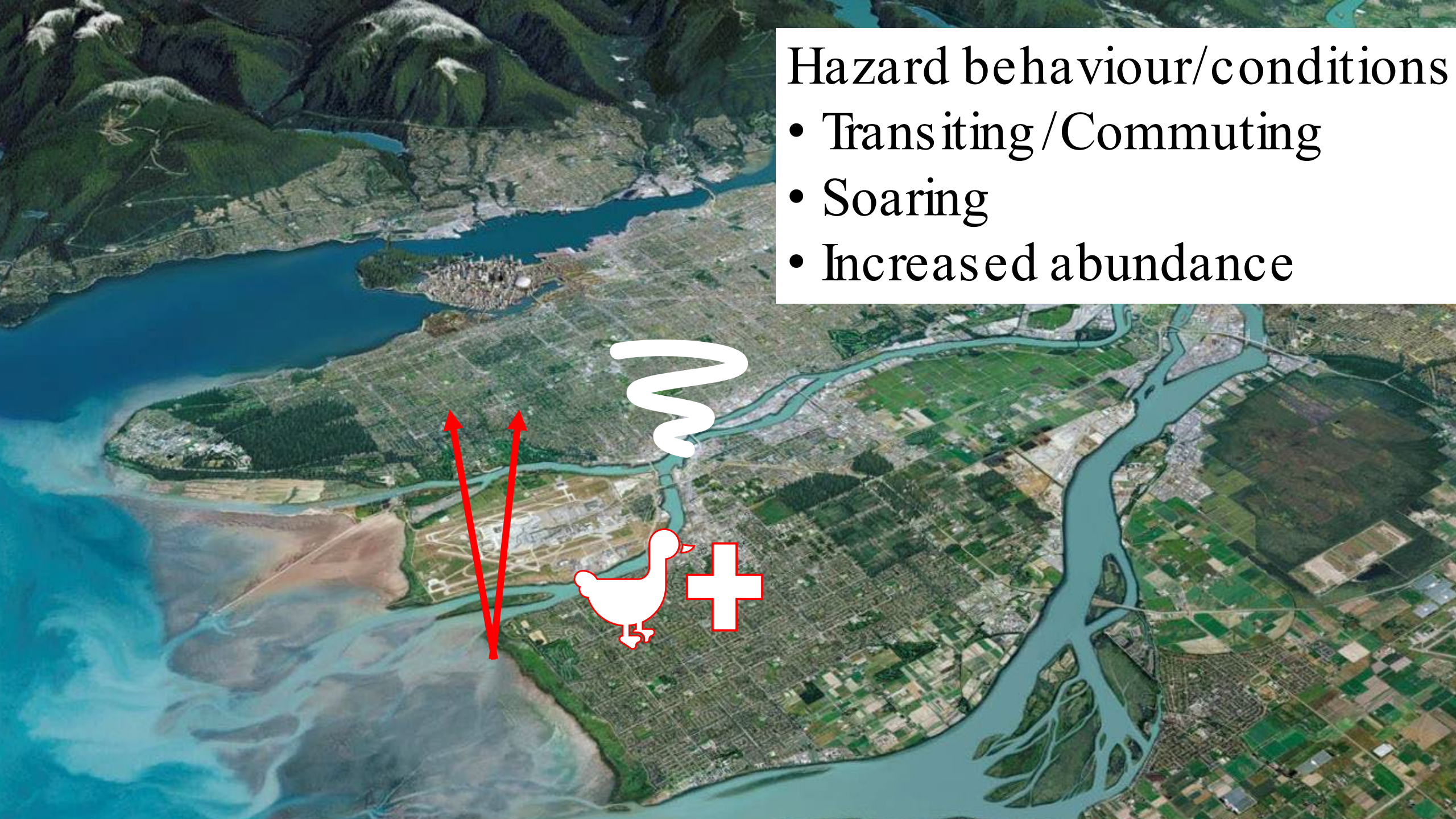
Explaining our interests:

Any land use can attract wildlife; we are concerned with land use changes that will **INCREASE** abundance and risk with 1+ kg birds



Hazard behaviour/conditions

- Transiting / Commuting
- Soaring
- Increased abundance





Proposed land use changes should be assessed based on net change in hazardous bird abundance & behaviour

Forecasting change in bird communities will be key:

- Occurrence
- Abundance
- Behaviour

Numerical models can help but must be applied at a relevant spatial scale



Example:

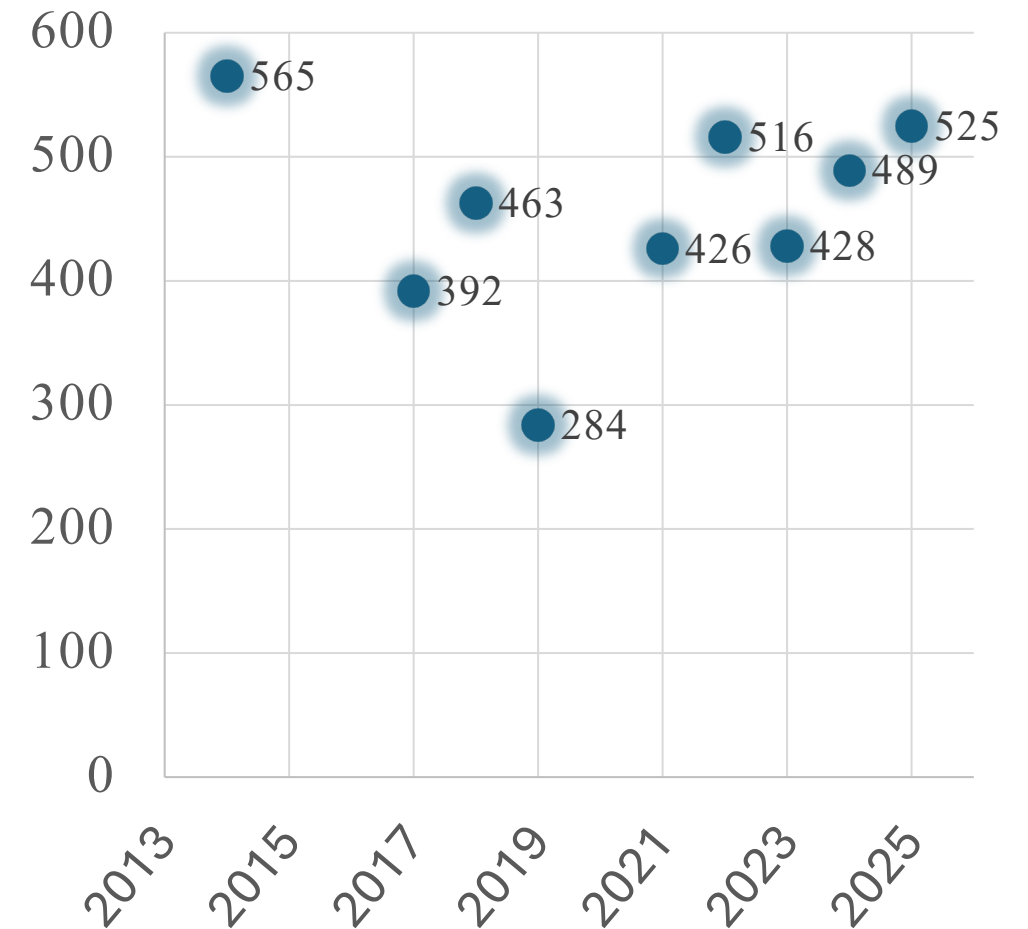
McAlister, M. A., Moorman, C. E., Meentemeyer, R. K., Fuller, J. C., Howell, D. L., & DePerno, C. S. (2017). Using Landscape Characteristics to Predict Distribution of Temperate-Breeding Canada Geese. *Southeastern Naturalist*, 16(2), 127–139. <https://www.jstor.org/stable/26454737>

Williams, Christopher & Watts, Katherine & Castelli, Paul & Nichols, Theodore. (2014). Spatially-explicit land use effects on nesting of Atlantic Flyway resident Canada geese in New Jersey. *Wildlife Biology*. 20. 115-121. 10.2981/wlb.13005.

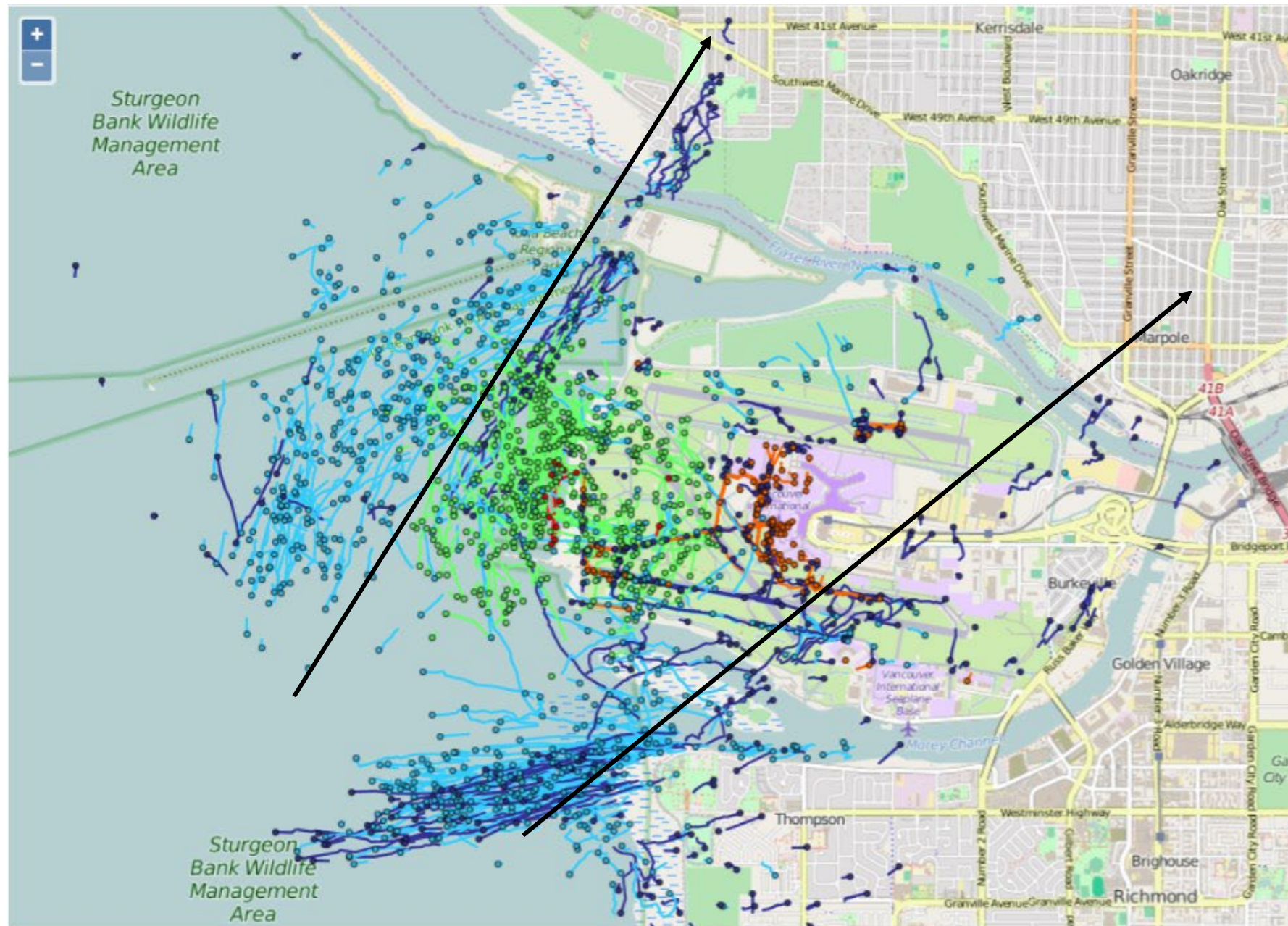
Ongoing surveys to establish baseline occurrence/abundance



Canada Goose molt survey
results 2014-2025



Radar used to
assess current
transit/commute
behaviour



Showing 1885 tracks between 03/11/2022 6:00 PM to 03/11/2022 7:00 PM

Land use change forecast
to **DECREASE** hazard bird
behaviour/abundance?

Great!



Land use change **INCREASES** hazard bird abundance/behaviour?

- Effectively communicate the forecasted RISK.
- Notify regulator





Image © 2025 Vexcel Imaging US, Inc.

Google Earth



1985

Imagery Date: 6/11/2024 lat 49.186522° lon -123.158476° elev 0 ft eye alt 6270 ft



Image © 2025 Vexxel Imaging US, Inc.

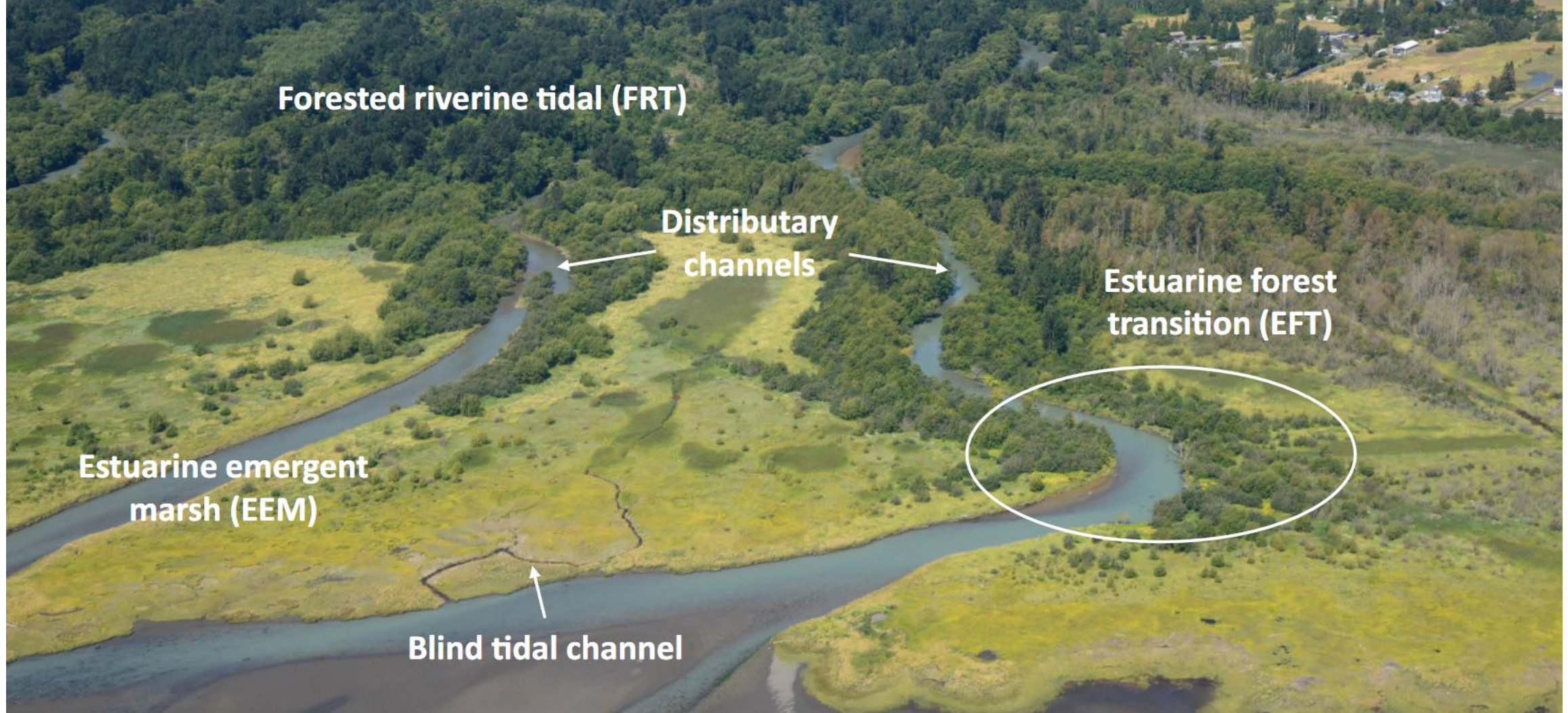
Google Earth

1985

Imagery Date: 6/11/2024 lat 49.179297° lon -123.144988° elev 0 ft eye alt 6270 ft

Finding common ground through conflict-wildlife management





Landscape determinants of aquatic estuarine habitat use by juvenile Chinook salmon

Eric M. Beamer, Correigh M. Greene, Joshua W. Chamberlin, W. Gregory Hood, Christopher S. Ellings, Sayre Hodgson, and W. Todd Zackey
Canadian Journal of Fisheries and Aquatic Sciences 2024 81:6, 747-767

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Compatible goals for
conservation &
aviation safety may
positively influence
land use decisions

