Caspian Tern Response to Management at Goose Island, Potholes Reservoir, as Indicated Using Satellite Telemetry

OSU Oregon State University

USGS science for a changing world

RTR REAL TIME RESEARCH

Acknowledgments

Co-authors: James Tennyson, Allison Patterson, Dan Roby, Yasuko Suzuki, Pete Loschl, Ken Collis

Funding:

Grant County Public Utility District
(Curt Dotson)
Priest Rapids Coordinating Committee

Background

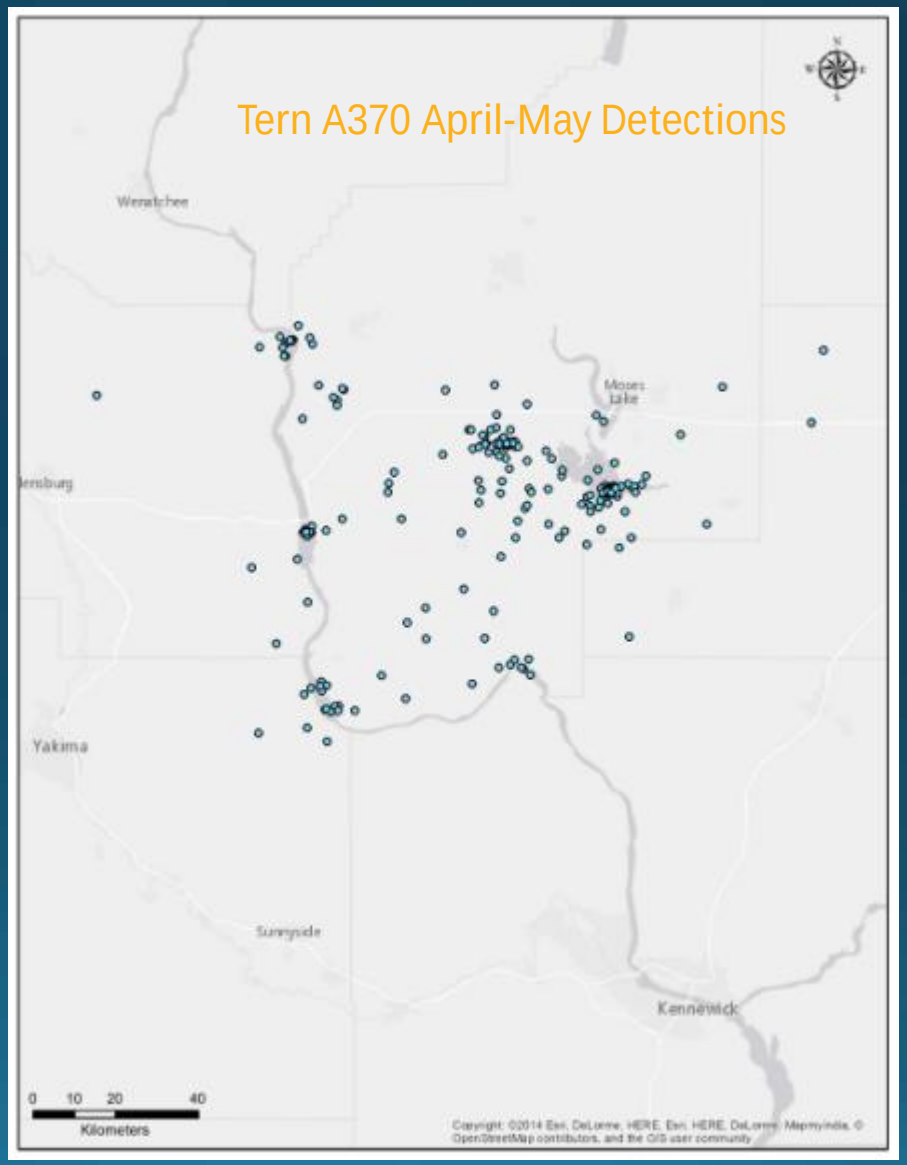
- Caspian terns nesting on Goose Island in Potholes Reservoir annually consume an average of 15.7% of ESA-listed steelhead smolts and 2.5% of ESA-listed Chinook salmon smolts out-migrating from the mid-Columbia River
- Action Agencies attempted to dissuade all Caspian terns from nesting on Goose Island-Potholes in 2014; ca. 160 pairs of terns nested on rocky islet adjacent to Goose Island
- Dissuasion included passive (stakes, ropes, & flagging) and active (human hazing) measures
- We evaluated the response of Caspian terns to management actions on Goose Island by satellite tagging terns captured prior to the breeding season

Tern Tagging Study: Methods

- Satellite tags deployed on 28 Caspian terns caught on former colony site at Goose Island, Potholes Reservoir during April 2-11
  - Terns captured were among earliest arrivers; potentially very committed to site
- Location data available on 28 hour cycle (6 hours on, 22 hours off)
- All tags collected data through the end of May
- 24 tags still functional and collecting data though November 17th

Tern Tagging Study: Types of Results

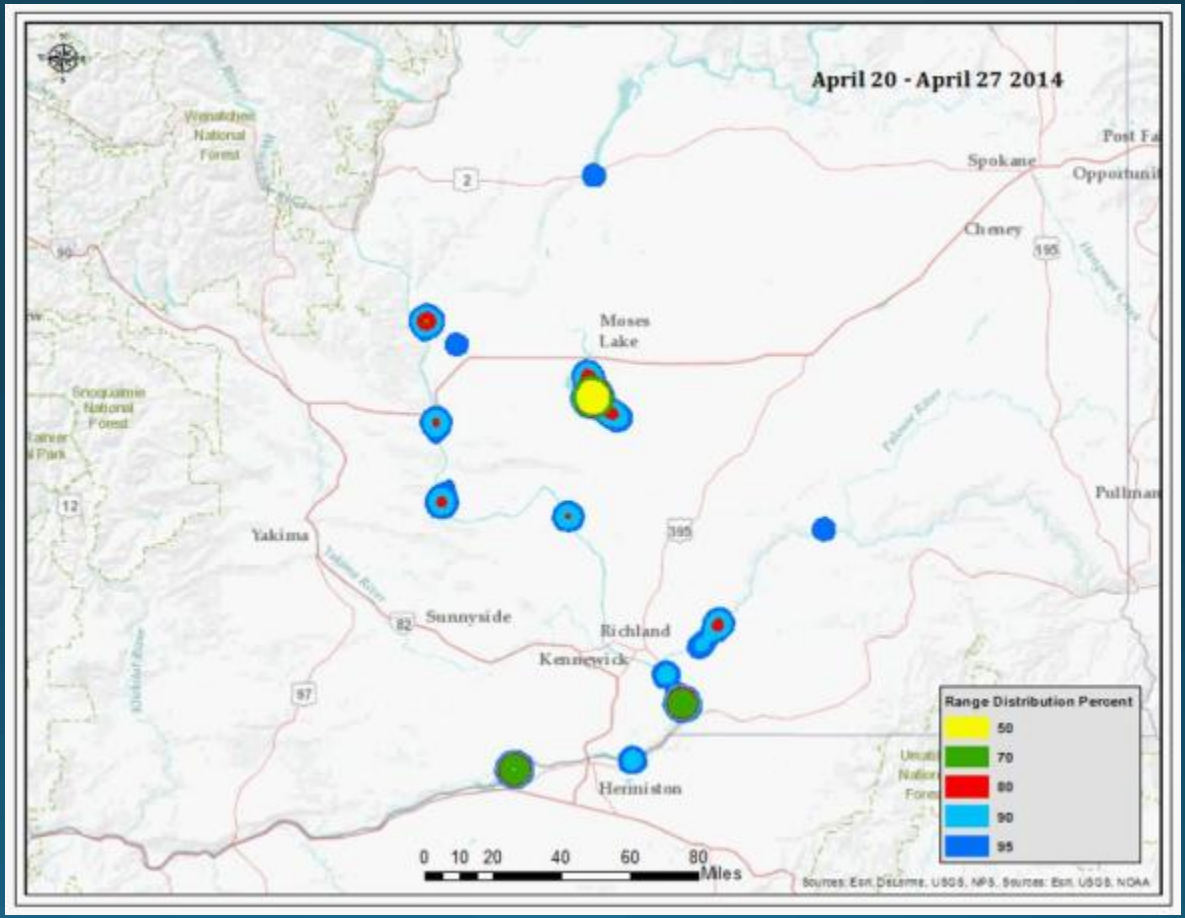
- Hotspots of activity on Columbia River Plateau
- Quantify proportion of activity in areas of concern
- Identify nesting locations of interest



Columbia River Plateau Hotspots

April 20 - 27

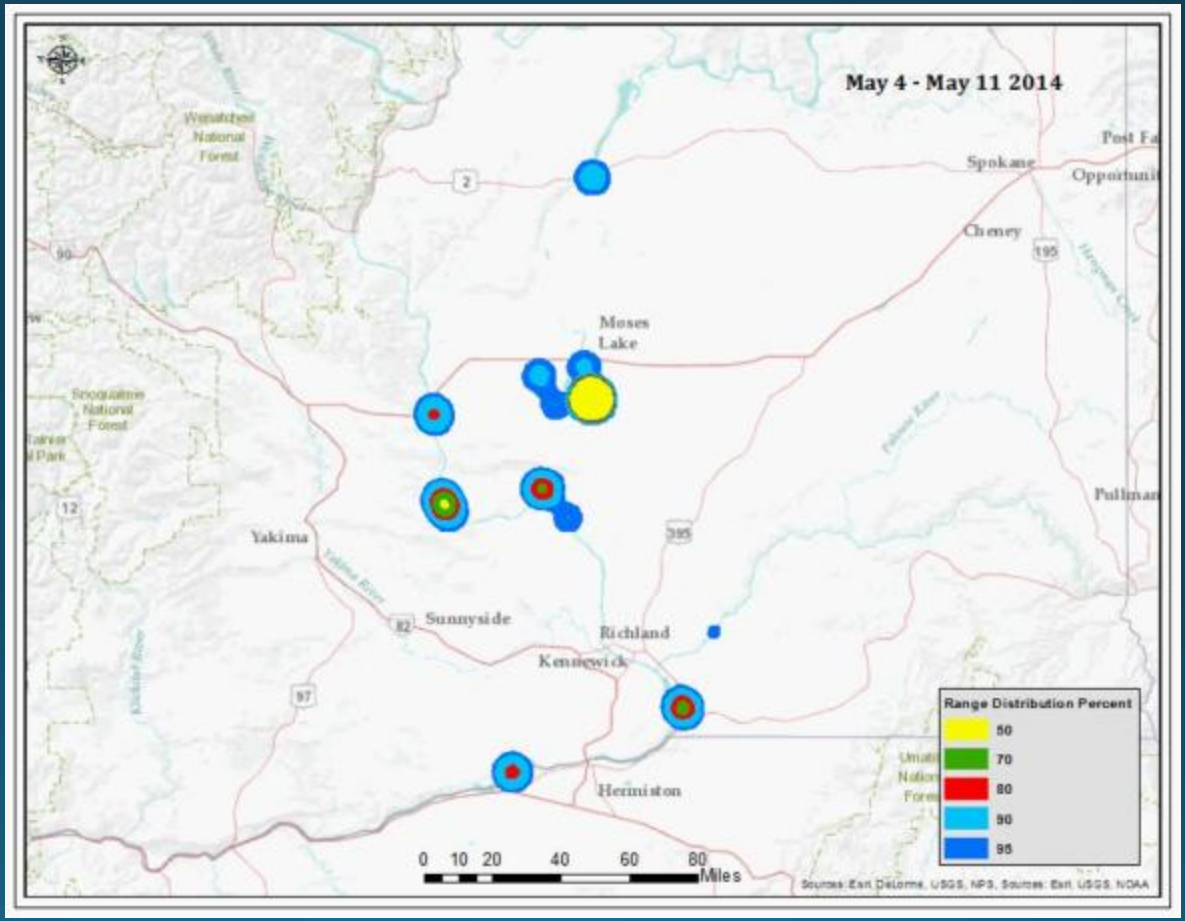
- Most birds have remained on Goose Is.
- Some birds active around Crescent and Blalock islands colonies
- River foraging hotspots:
  - Crescent Bar
  - Vantage Bridge
  - Cabin Island
  - Hanford Reach
  - Lower Snake



Columbia River Plateau Hotspots

May 4 -11

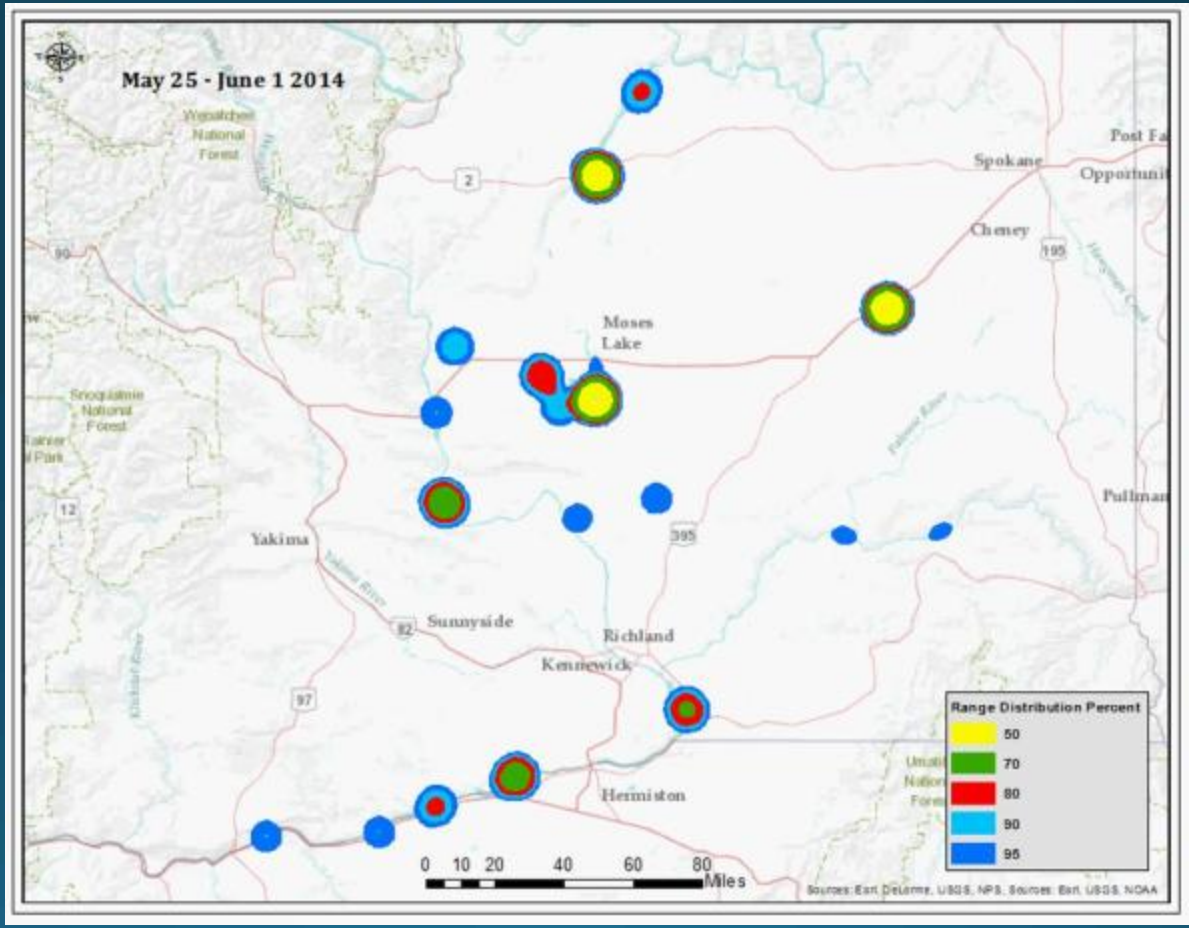
- Most birds have remained on Goose Is.
- Less activity around Crescent and Blalock islands colonies
- River foraging hotspots:
  - Vantage Bridge
  - Cabin Island
  - Hanford Reach



Columbia River Plateau Hotspots

May 25 – June 1

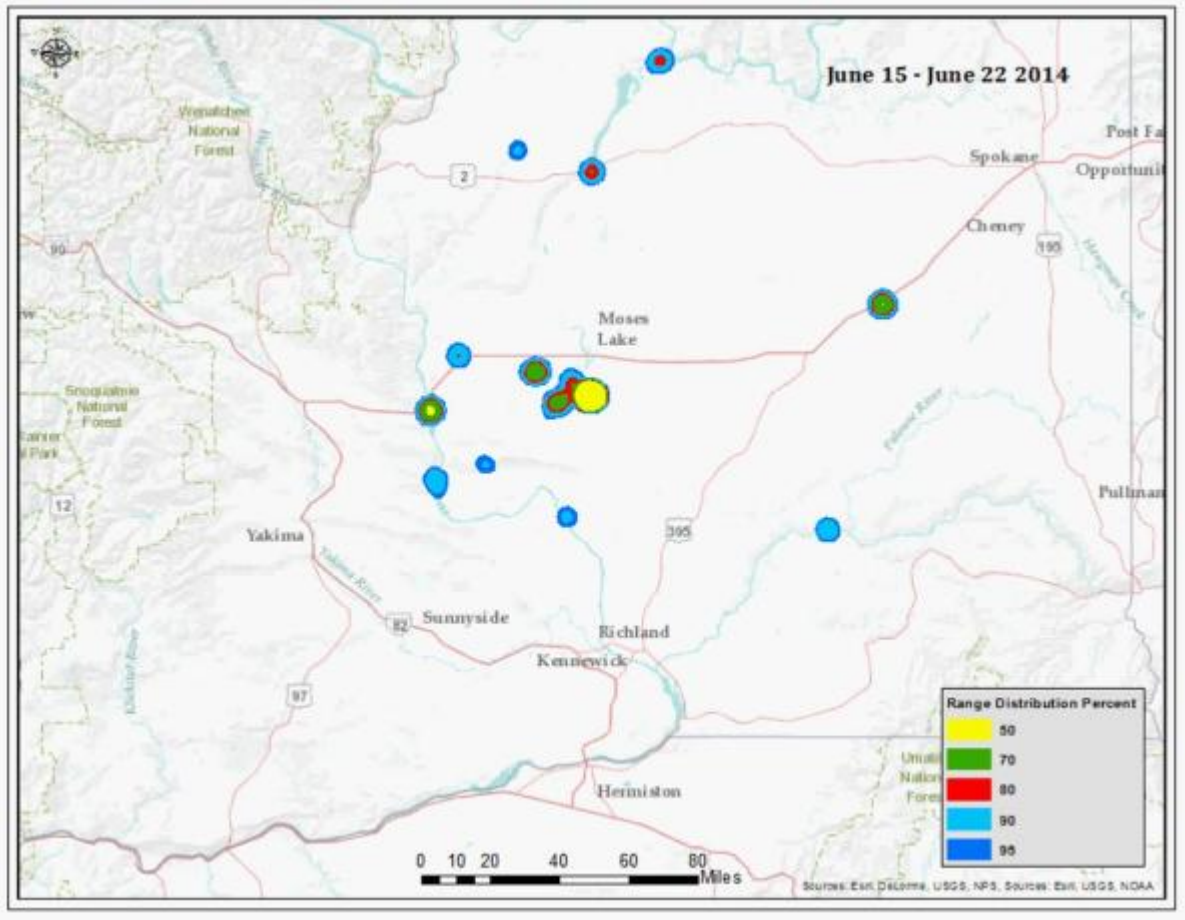
- Many birds have remained on Goose Is.
- Significant activity at Banks and Sprague Lakes; less around Crescent and Blalock islands
- Foraging hotspots at:
  - Cabin Island
  - Below Blalocks



Columbia River Plateau Hotspots

June 15 – 22

- Some birds returning to Goose Is.
- Reduced activity at all alternative colonies
- River foraging hotspots:
  - Vantage Bridge
  - Cabin Island



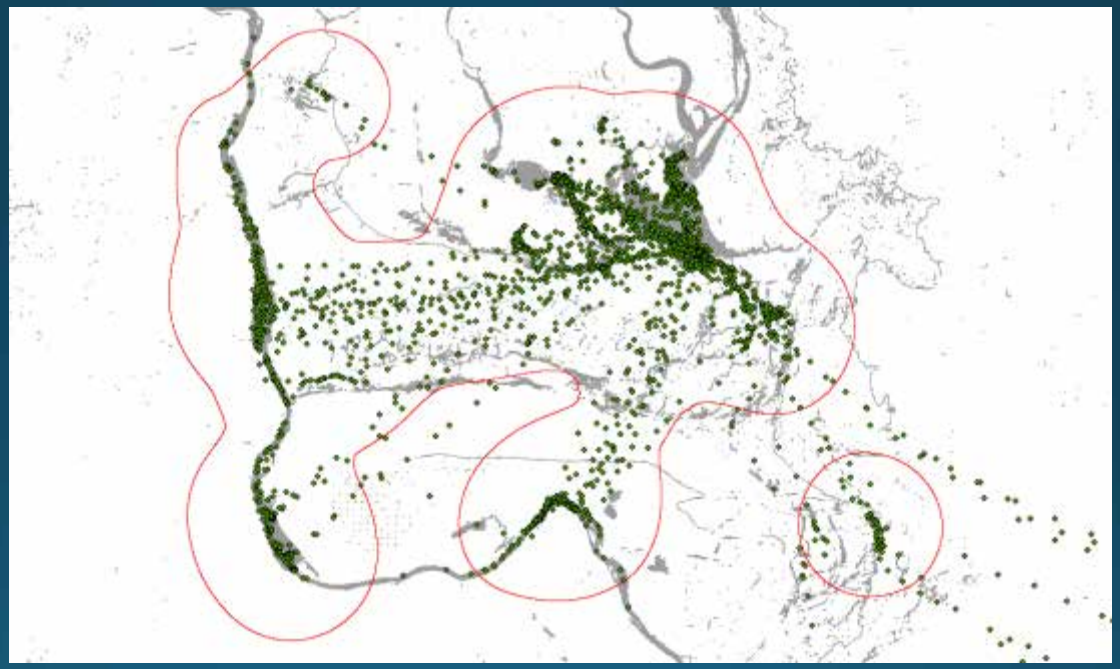
Tagged Tern Use of Upper Basin

- Documented areas used by terns nesting at Goose Island in a previous year
- Upper basin region defined by the Federal Columbia River Power System
- Entire Columbia Plateau

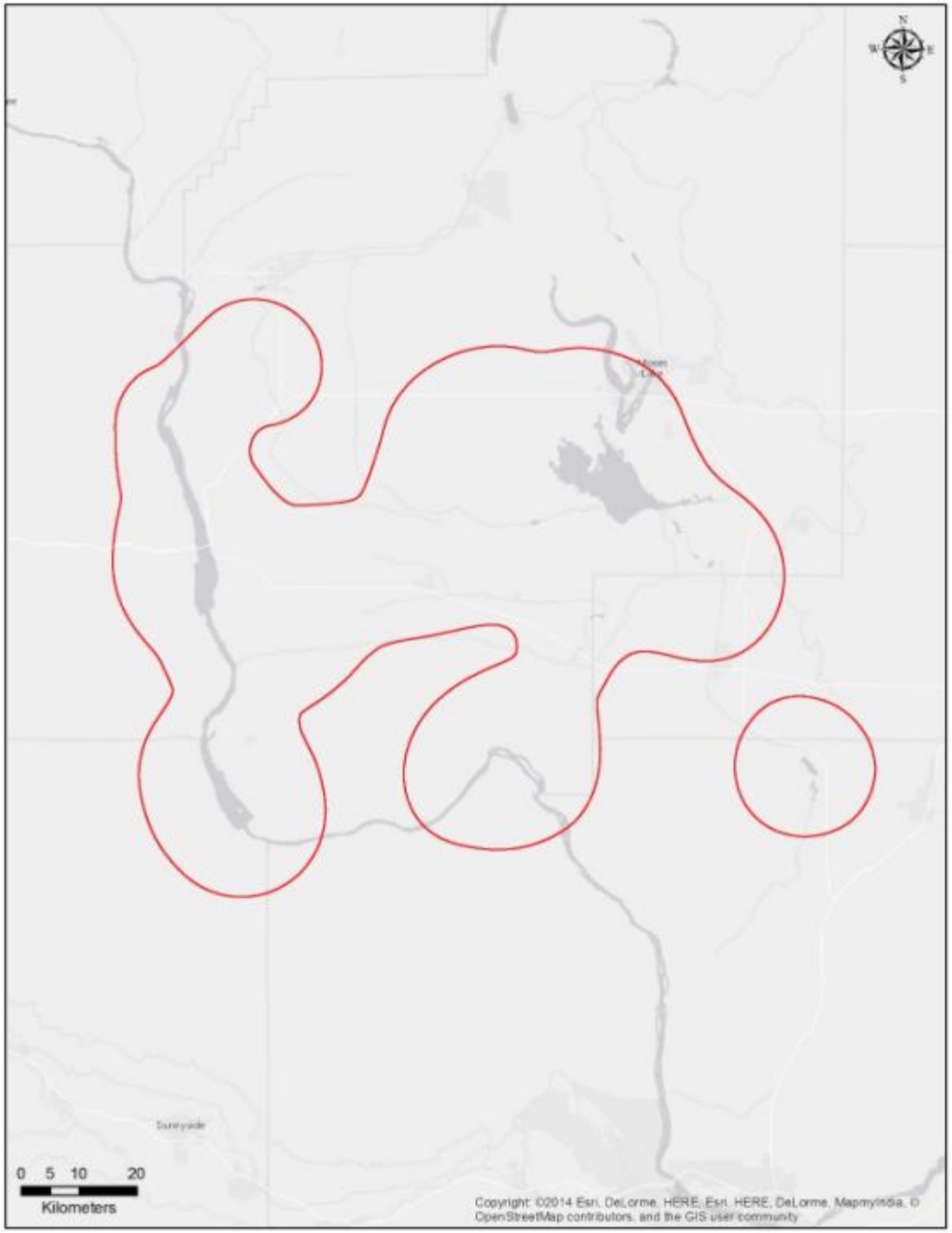
Traditional Foraging Areas of Goose Island Caspian Terns

2013 GPS Tagging Study

- Foraging distribution of Caspian terns nesting at Goose Is. in 2013
- 95% contour interval based on Kernal Density Estimate

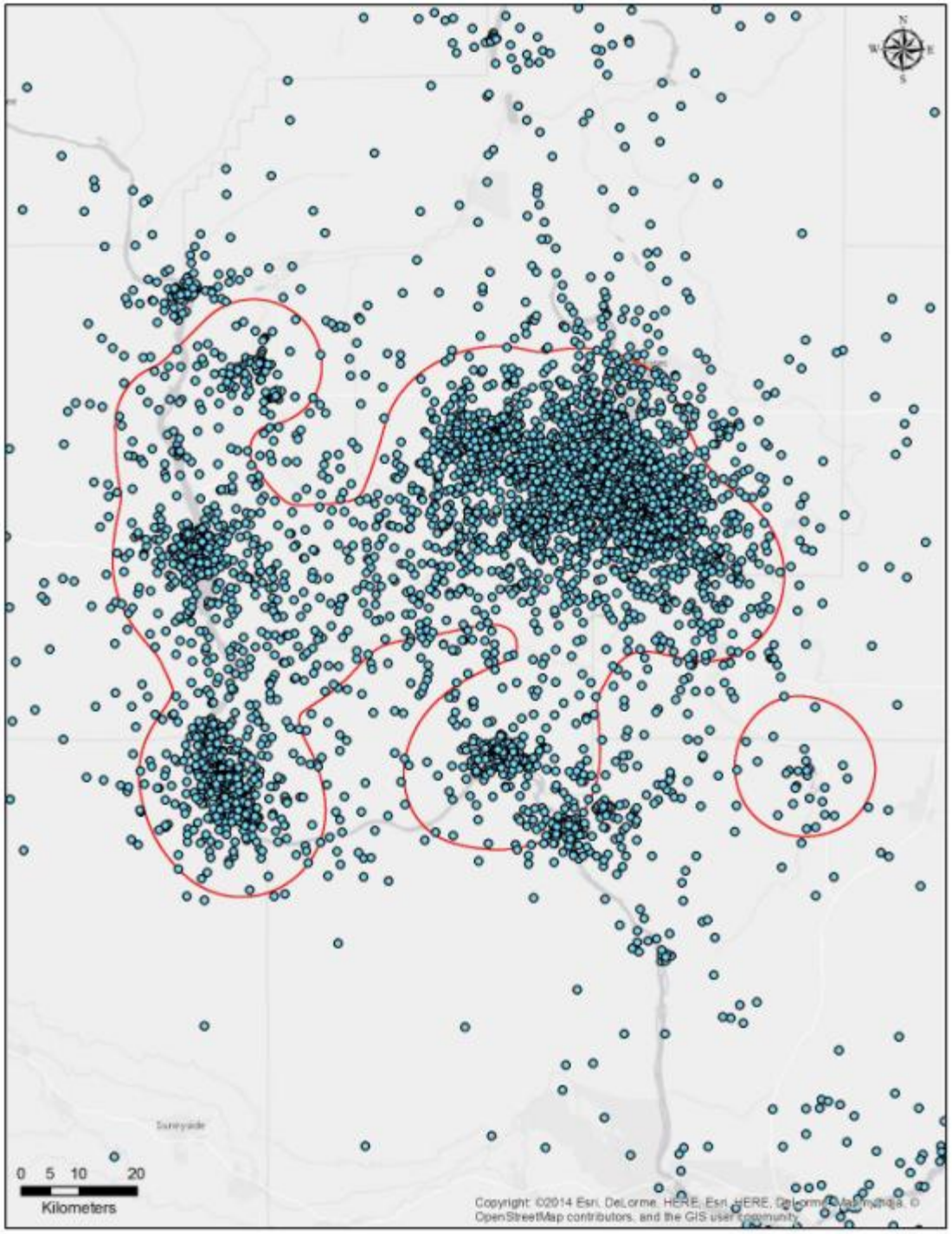


2014 Use of Traditional Foraging Areas of Goose Island Caspian Terns

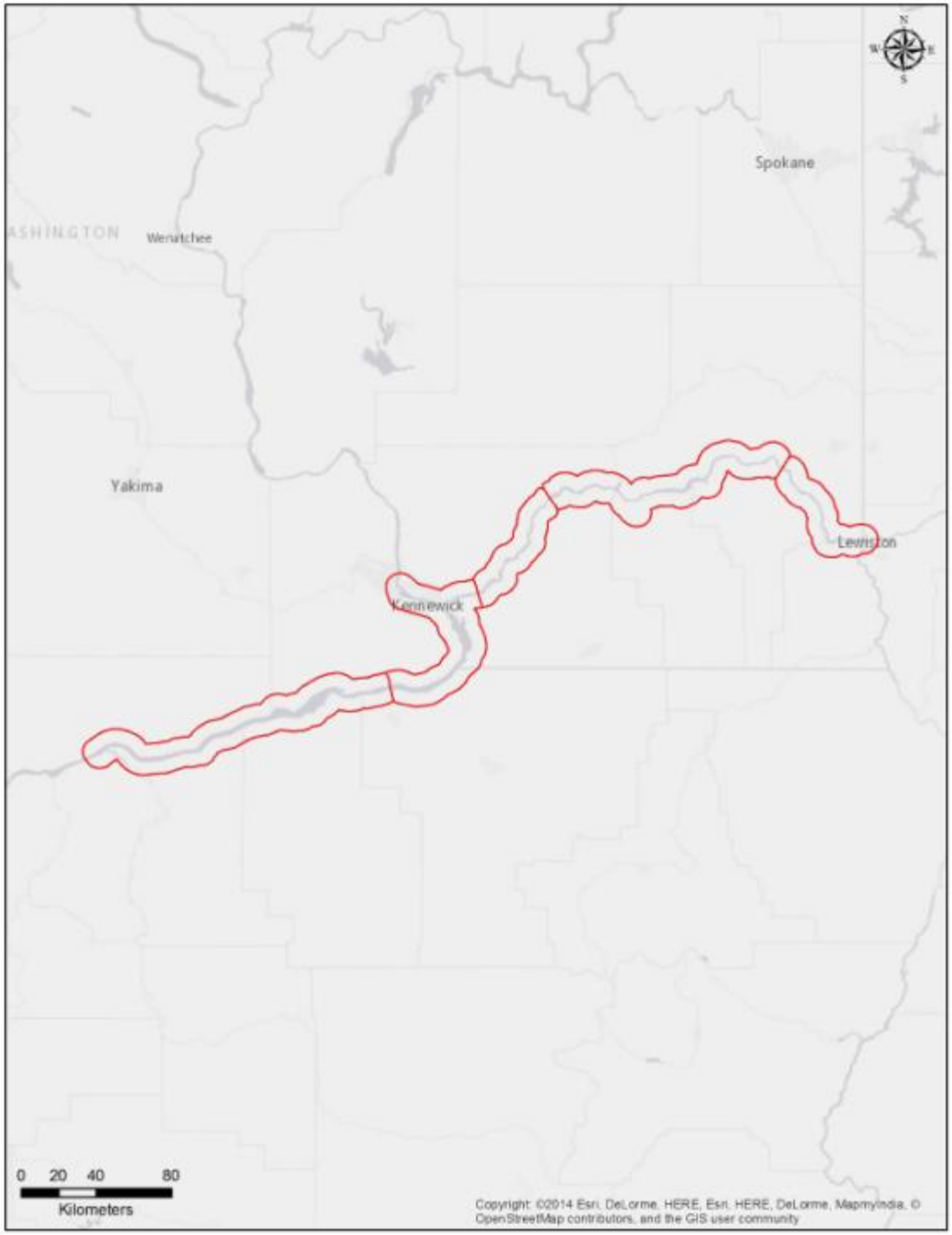


2014 Use of Traditional Foraging Areas of Goose Island Caspian Terns

- Terns spent 58% of time in 2013 foraging area, on average, during smolt outmigration period (April – May)

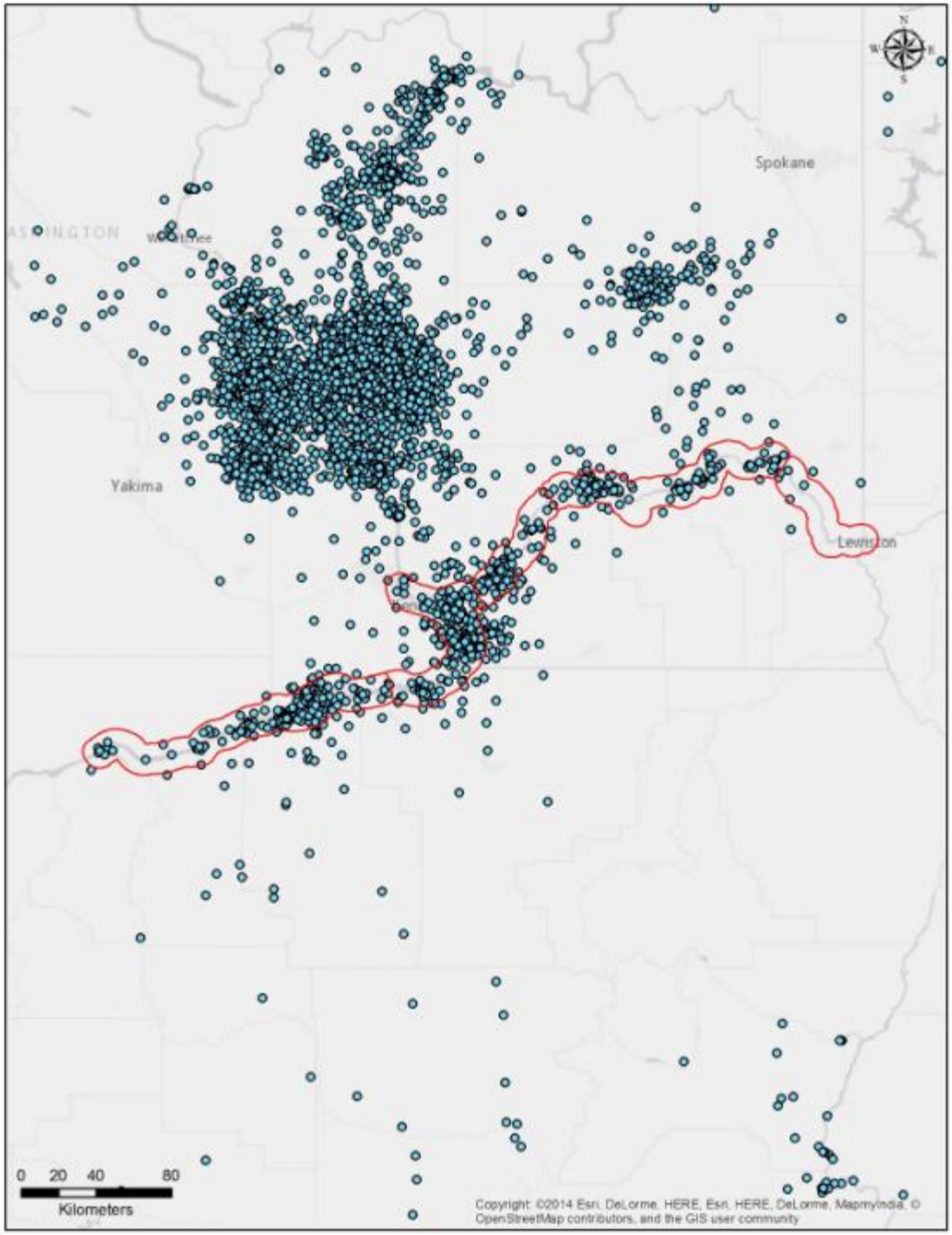


2014 Use of FCRPS

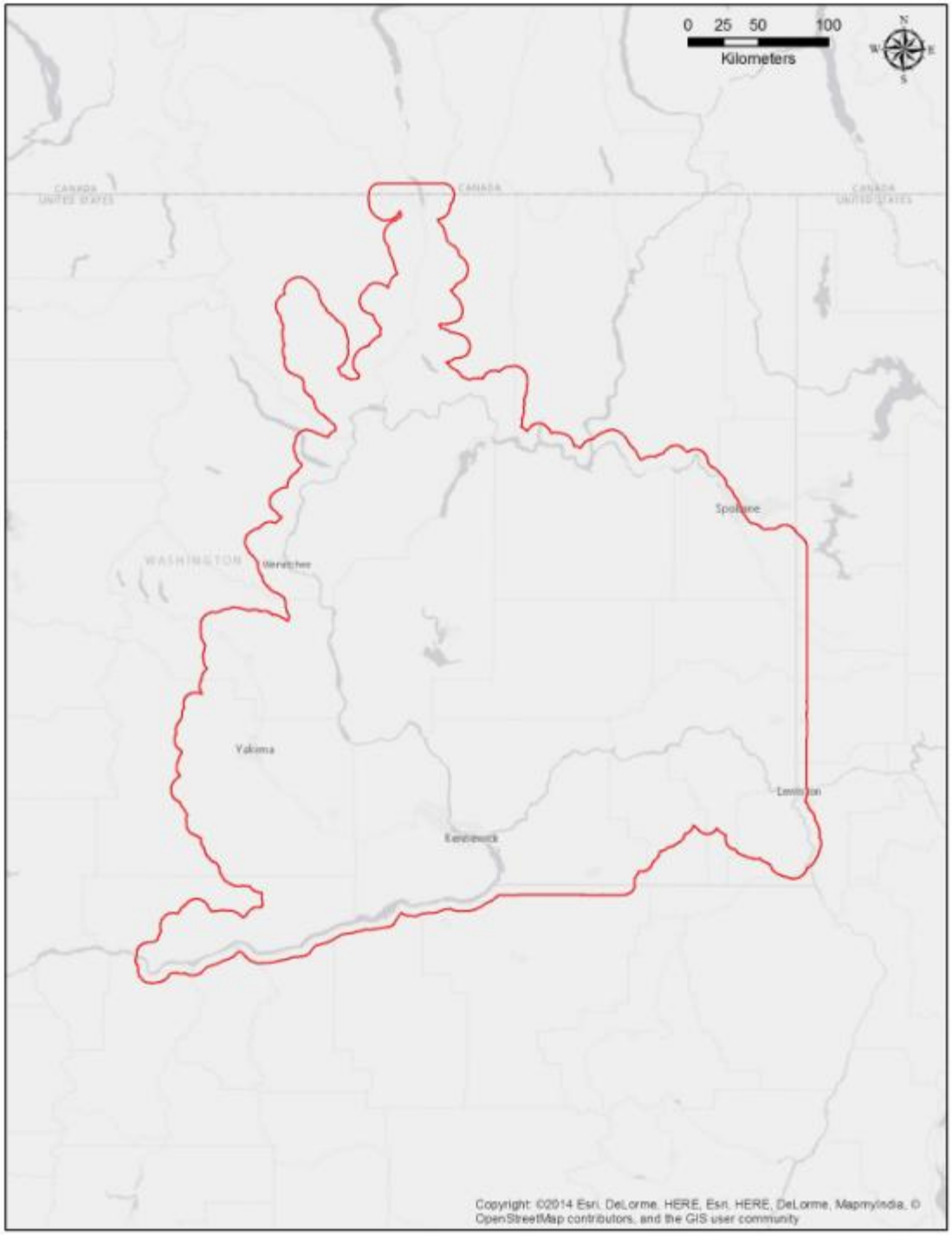


2014 Use of FCRPS

- Terns spent 21% of time in area defined by FCRPS, on average, during smolt outmigration period (April – May)

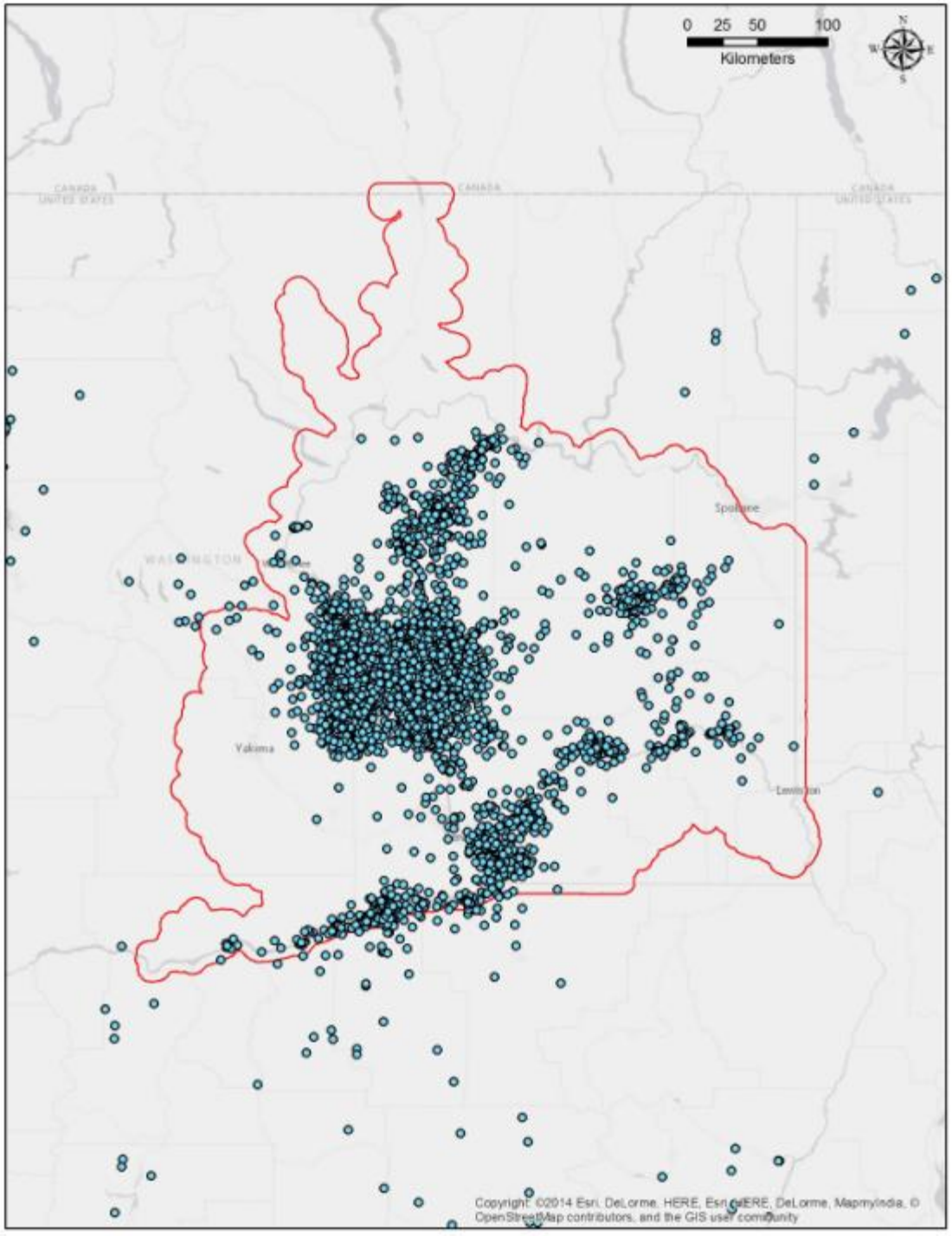


2014 Use of Columbia River Plateau



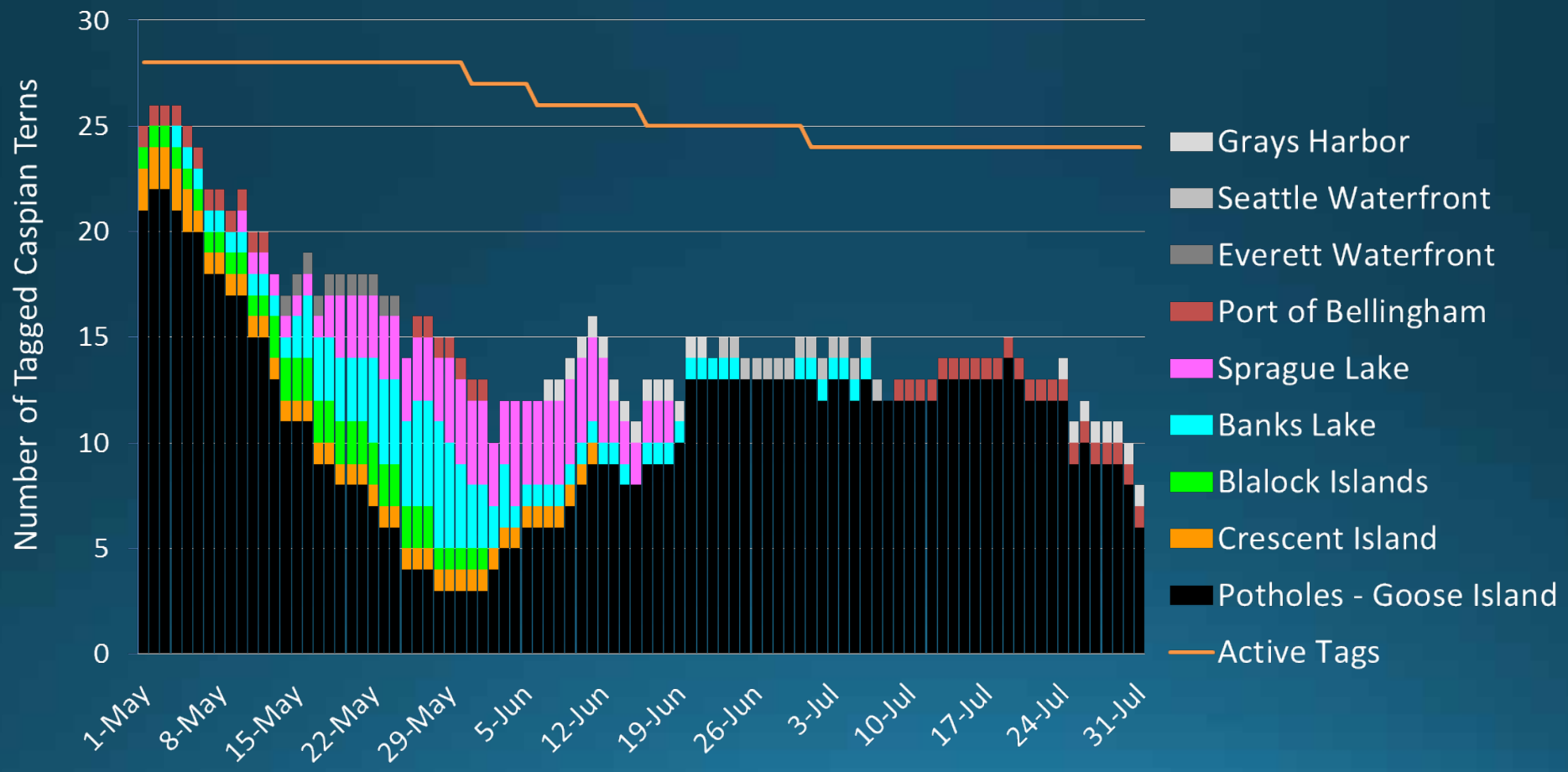
2014 Use of Columbia River Plateau

- Terns spent 90% of time within Plateau, on average, during smolt outmigration period (April – May)
- 14 terns spent 100% of time within Plateau
- 24 terns spend >75% of time within Plateau



Colony Associations of Tagged Terns

Based on Nighttime Attendance at Active or Historical Colony Sites



Colony Associations of Tagged Terns

- Tagged birds displayed three general categories of response to displacement and habitat reduction:
  - Stay and compete for reduced habitat
  - Move and associate with another colony; return if colony fails
  - Nomadic wandering without sustained colony association

Caspian Tern Tagging Conclusions

- Use of traditional Goose Island terns foraging areas (i.e. Priest Rapids and Wanapum Projects, Potholes Reservoir) was reduced by almost half
- Foraging hotspots on the Columbia River were dynamic across the smolt outmigration period
- Displaced terns mostly remained on Plateau, associating with Goose Is. or other nearby colonies
- About half of terns had no sustained association with any colony, but visited many
- Tagging is an effective technique to observe tern response to management

Questions?

- More information available at: www.birdresearchnw.org

Tagged Caspian Tern Locations 11/16/2014

Caspian Tern Capture on Goose Island, Potholes Reservoir April 11,2014