

## Susitna-Watana Hydroelectric Project Document ARLIS Uniform Cover Page

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## 10. FIGURES

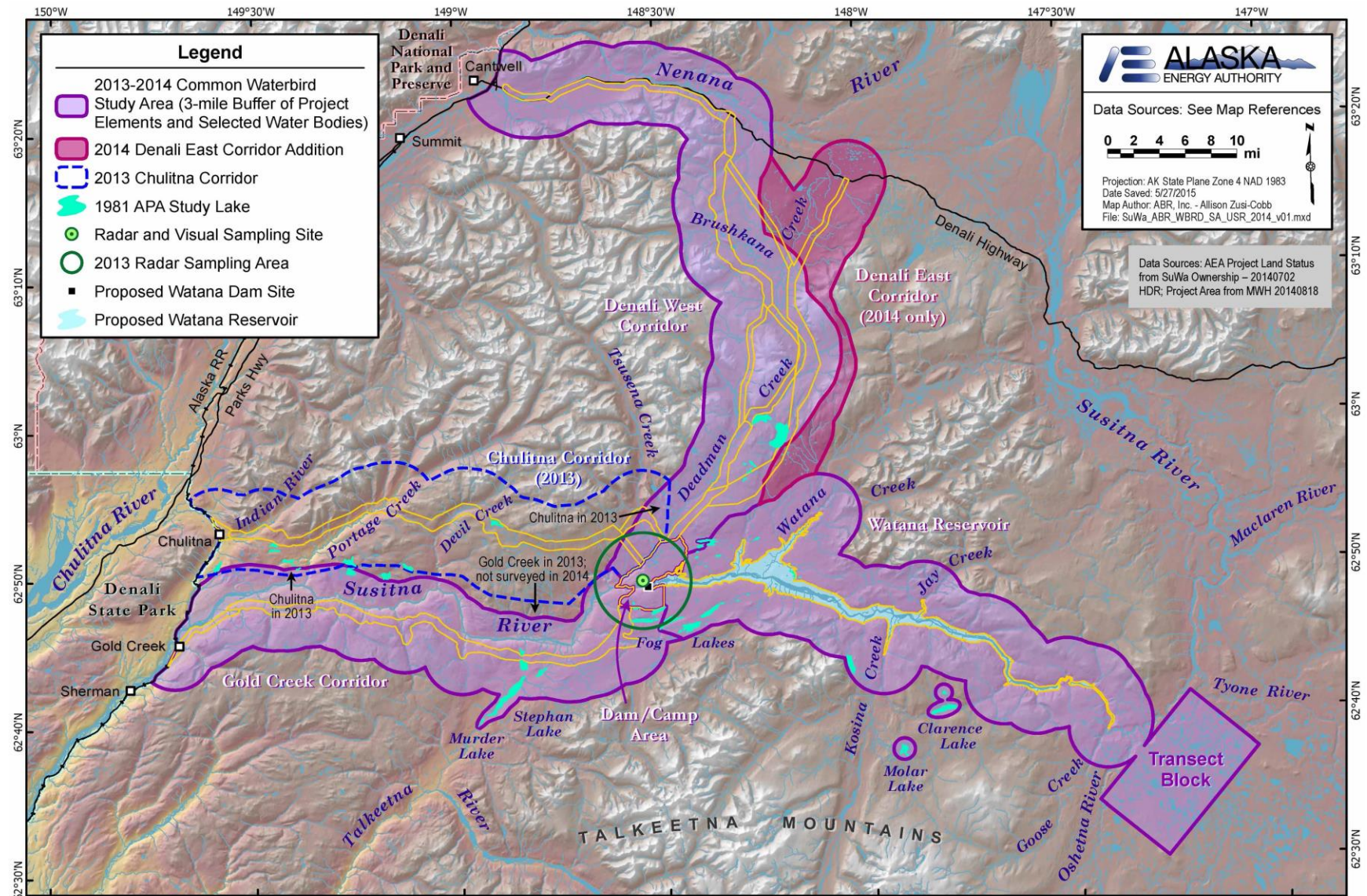


Figure 3.1. Waterbird Study Area for the Susitna-Watana Hydroelectric Project, 2013-2014.



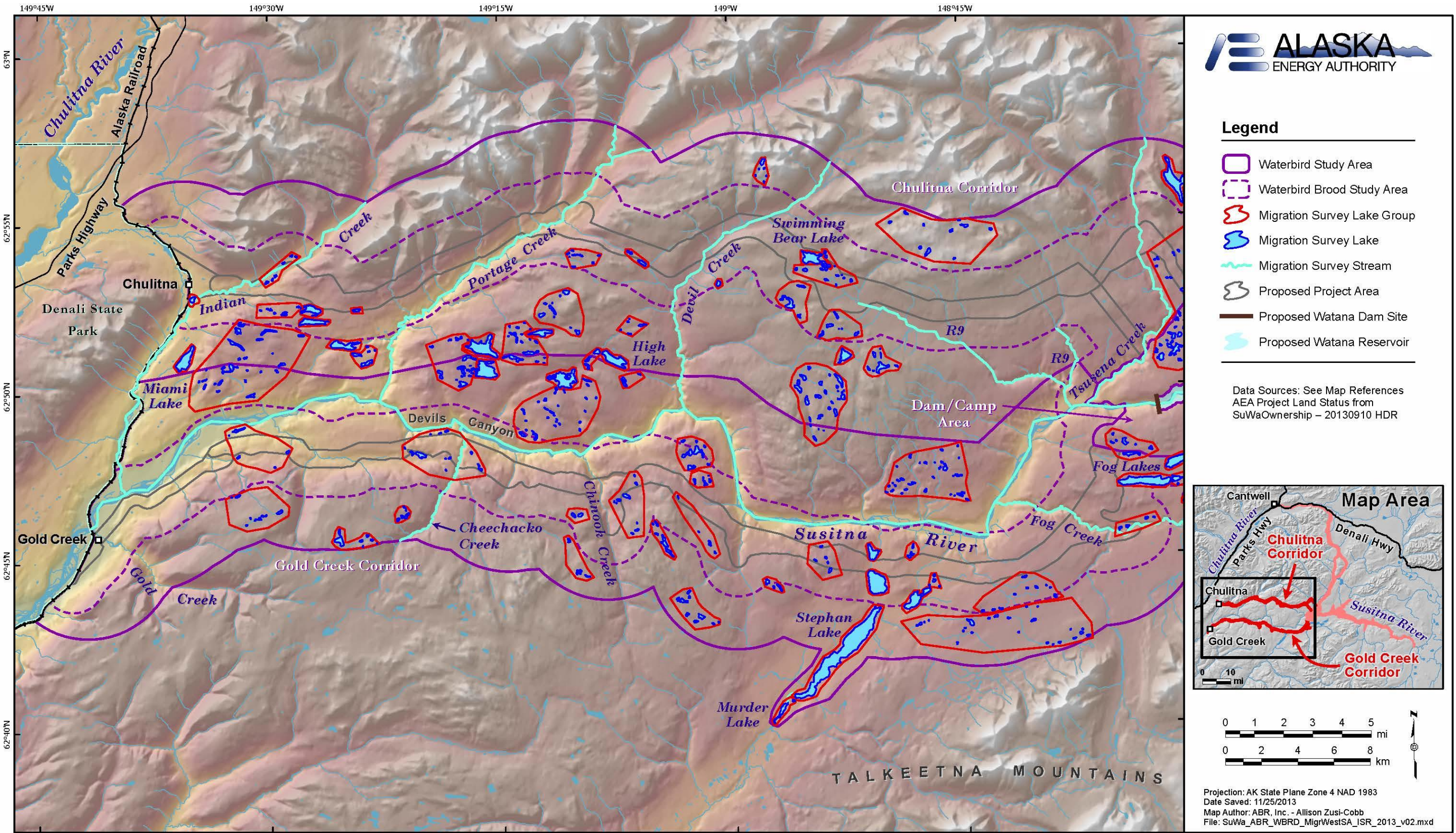


Figure 4.1-1. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Chulitna and Gold Creek Corridors, 2013.



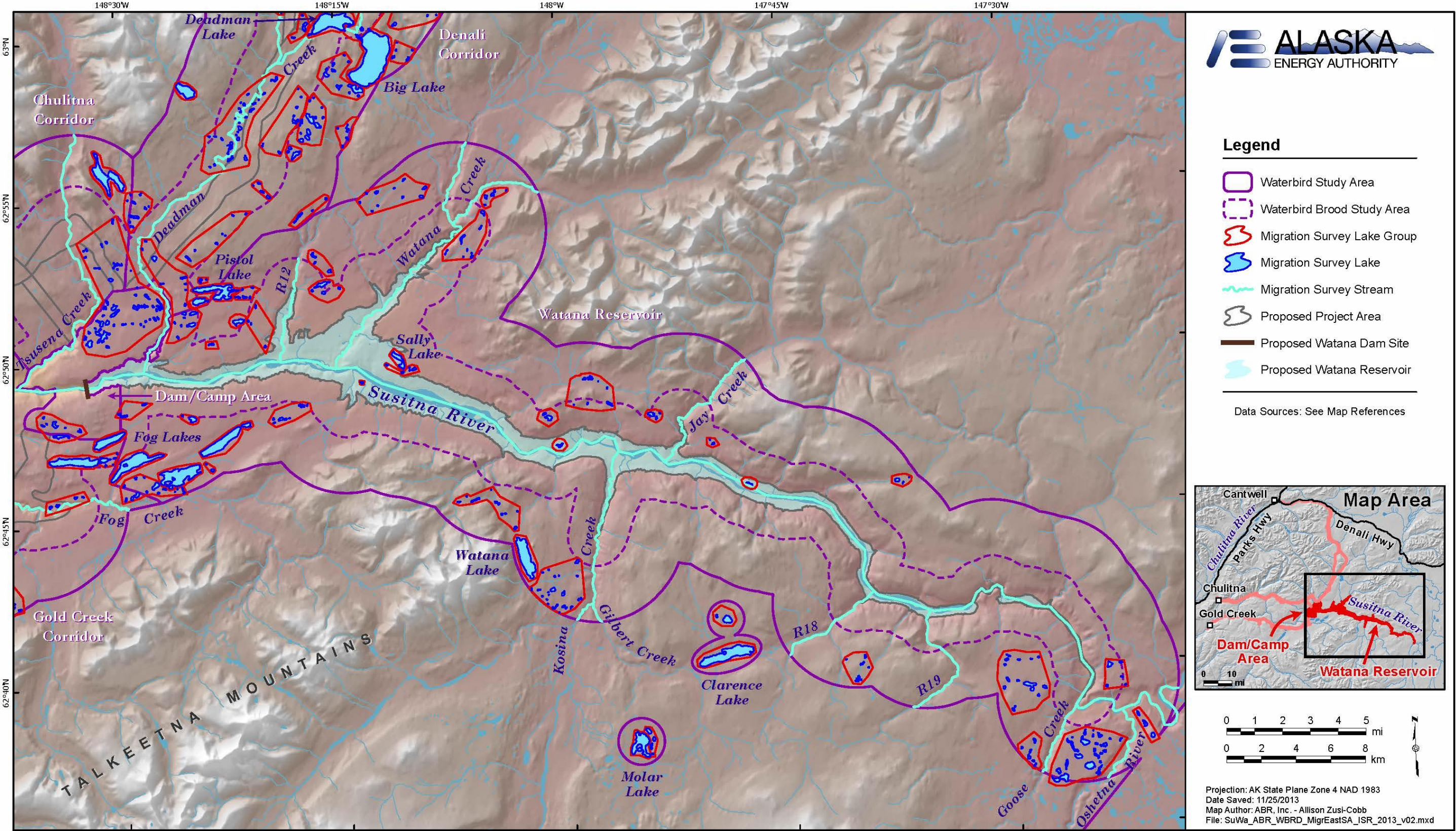


Figure 4.1-2. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Reservoir Inundation Zone and Vicinity, 2013.



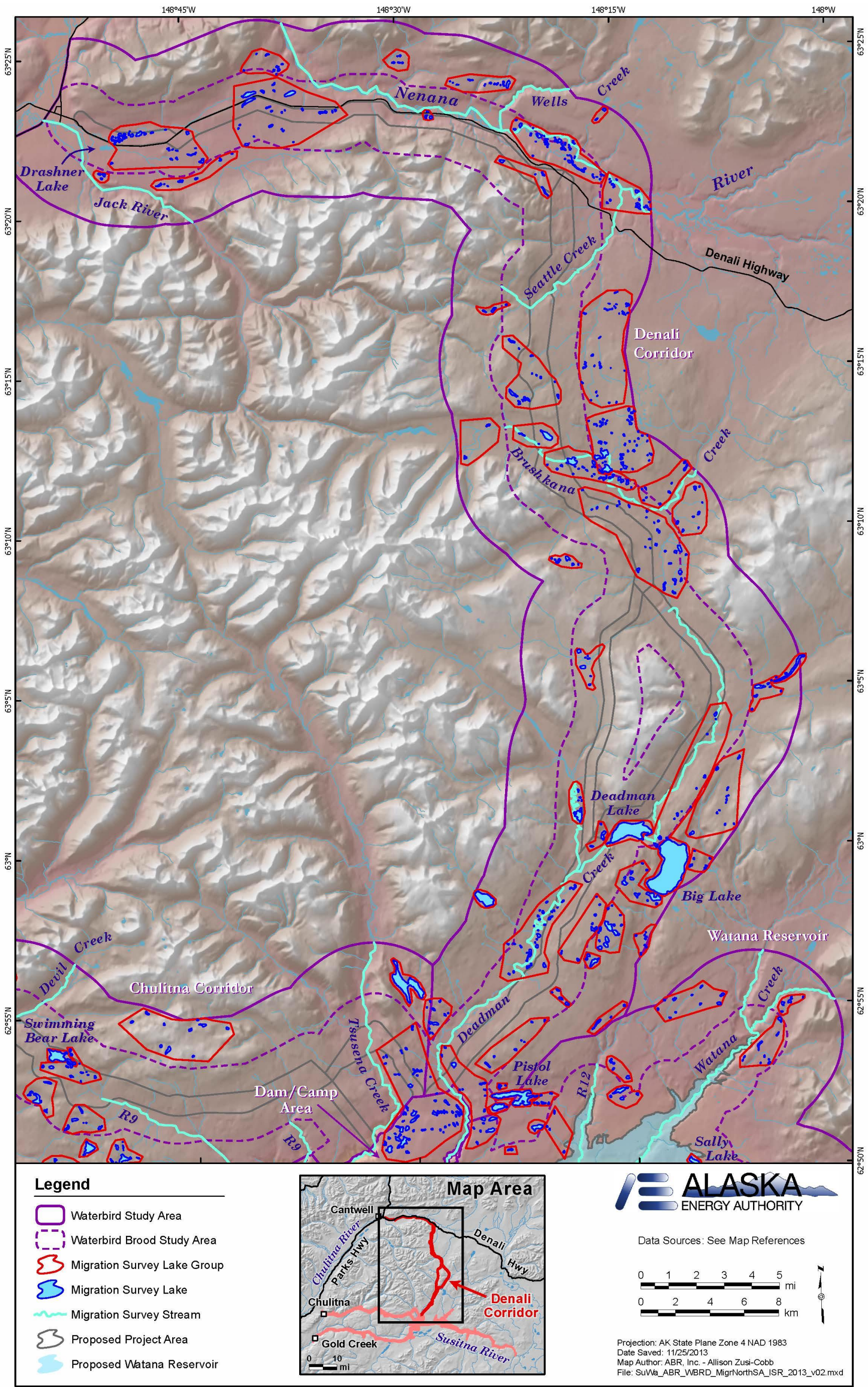


Figure 4.1-3. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Denali West Corridor, 2013.



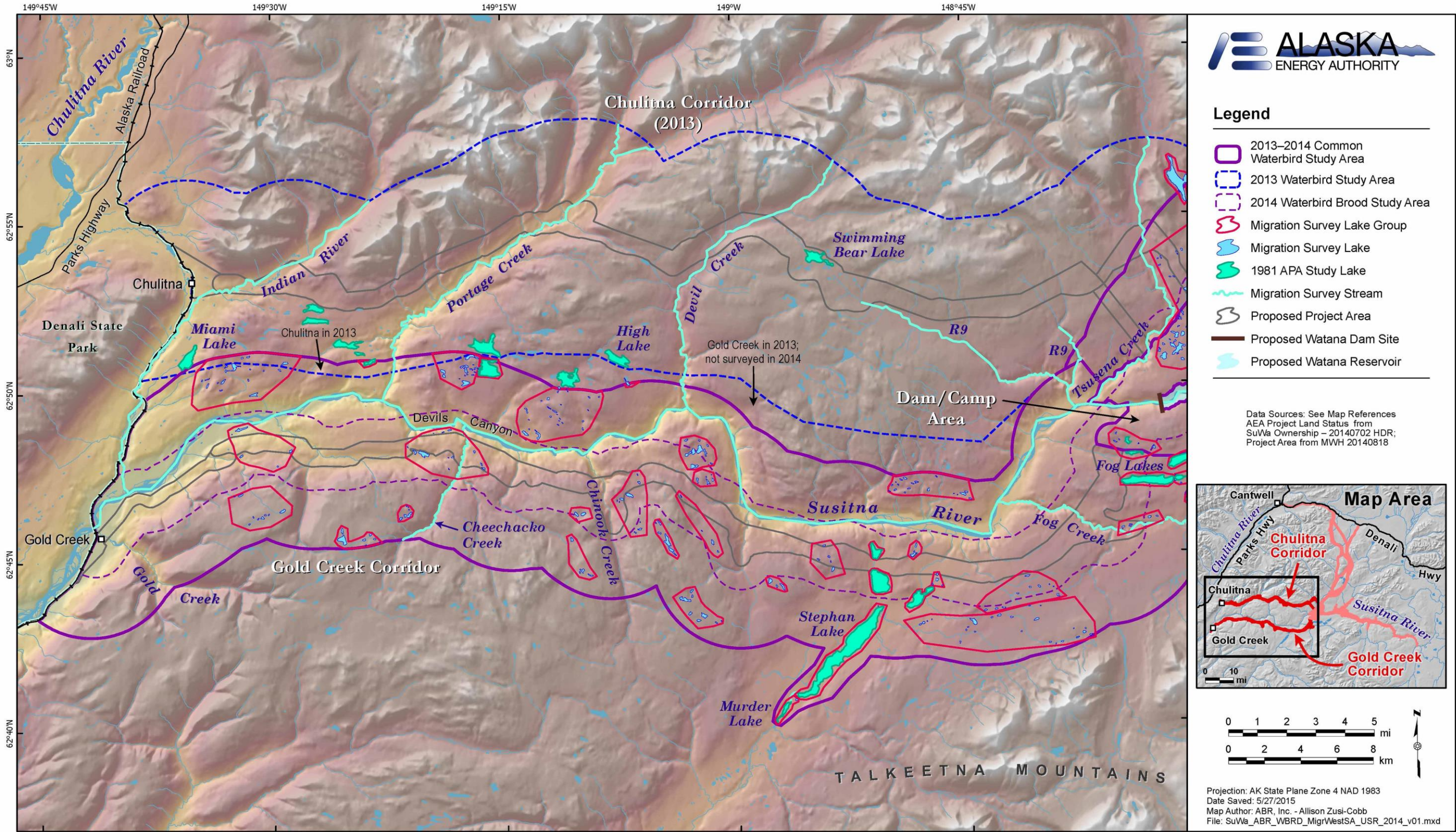


Figure 4.1-4. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Chulitna and Gold Creek Corridors, 2014.



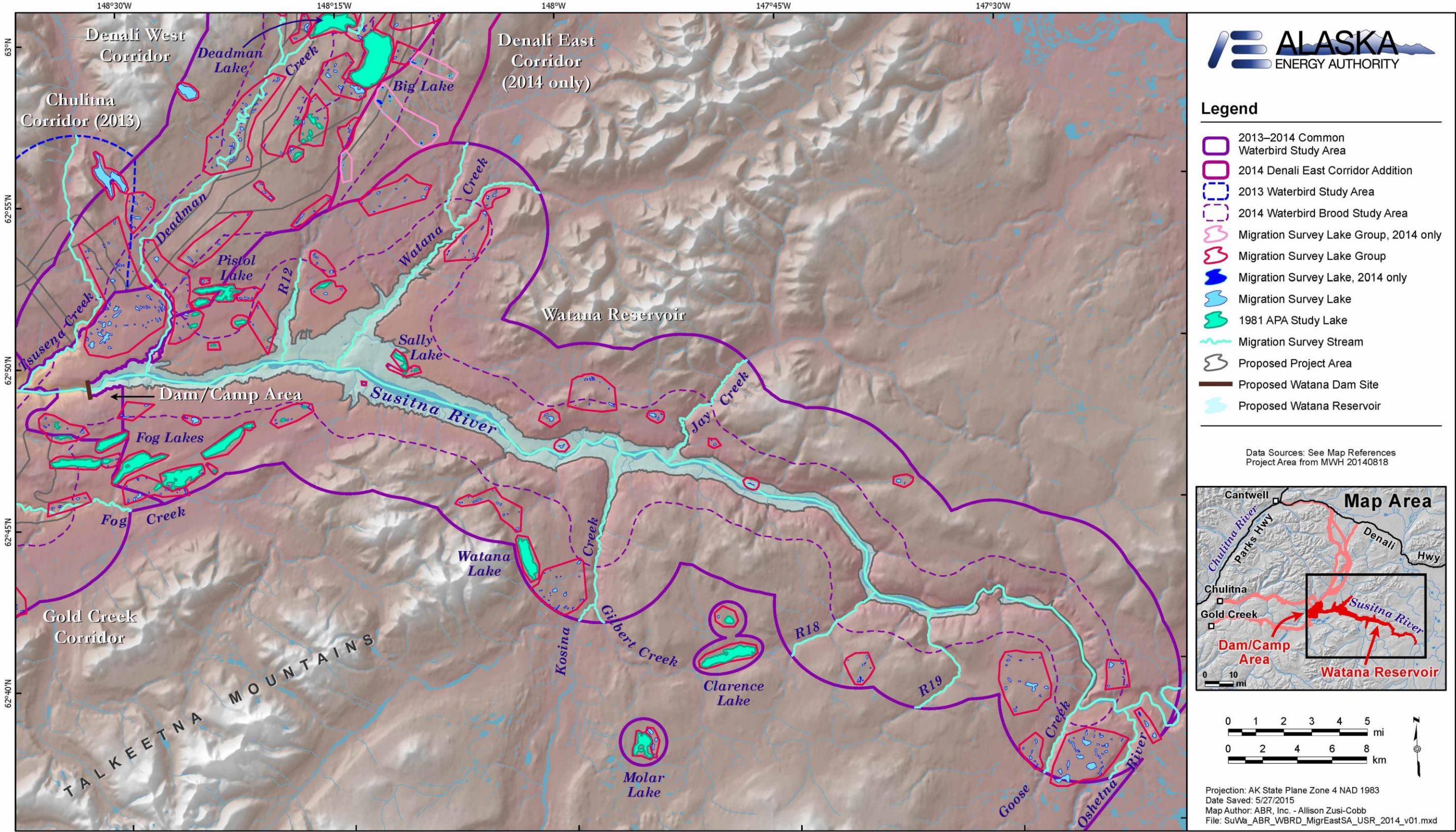


Figure 4.1-5. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Reservoir Inundation Zone and Vicinity, 2014.



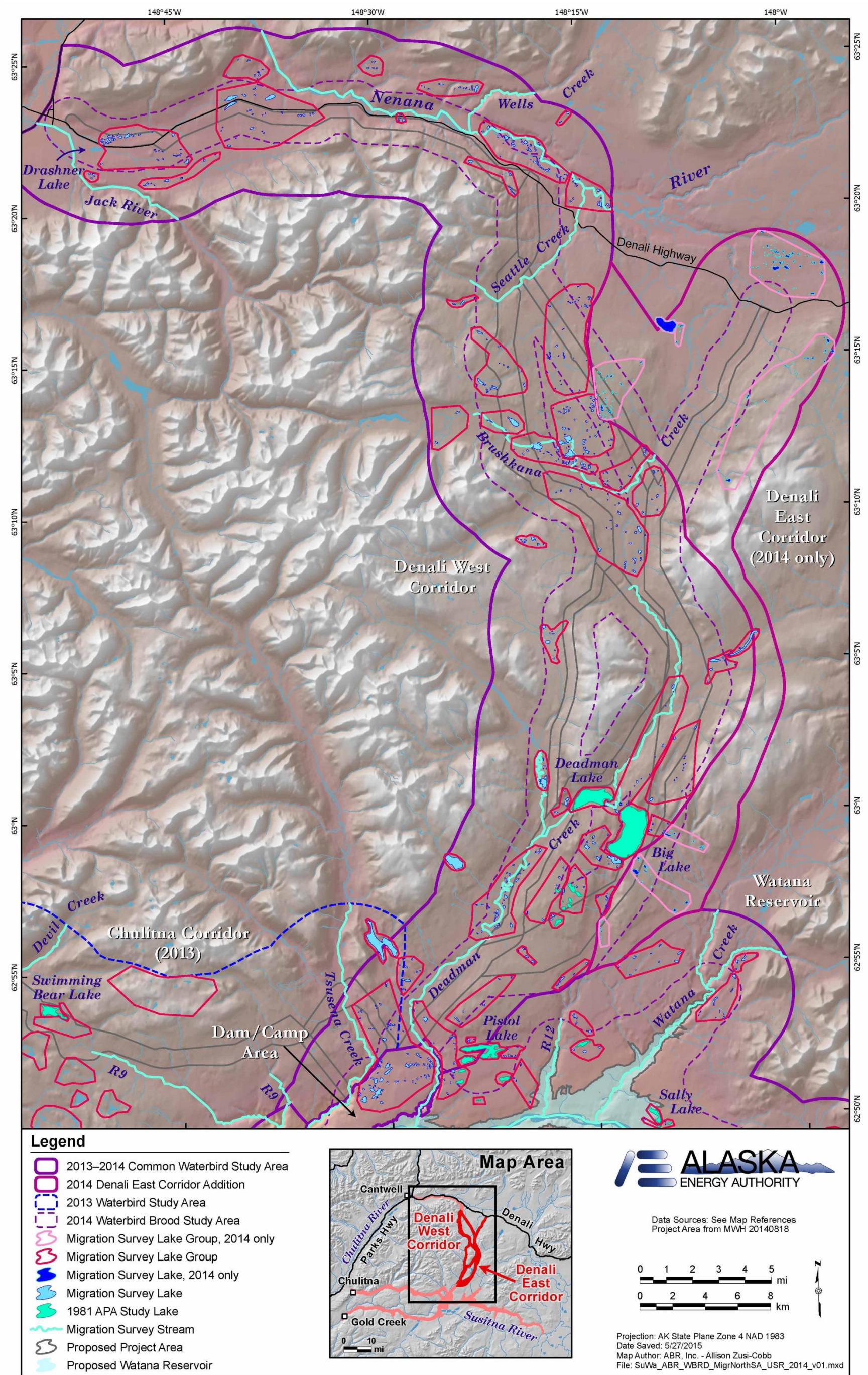


Figure 4.1-6. Water Bodies Surveyed for Waterbirds during Spring and Fall Migration in the Denali East and Denali West Corridors, 2014.



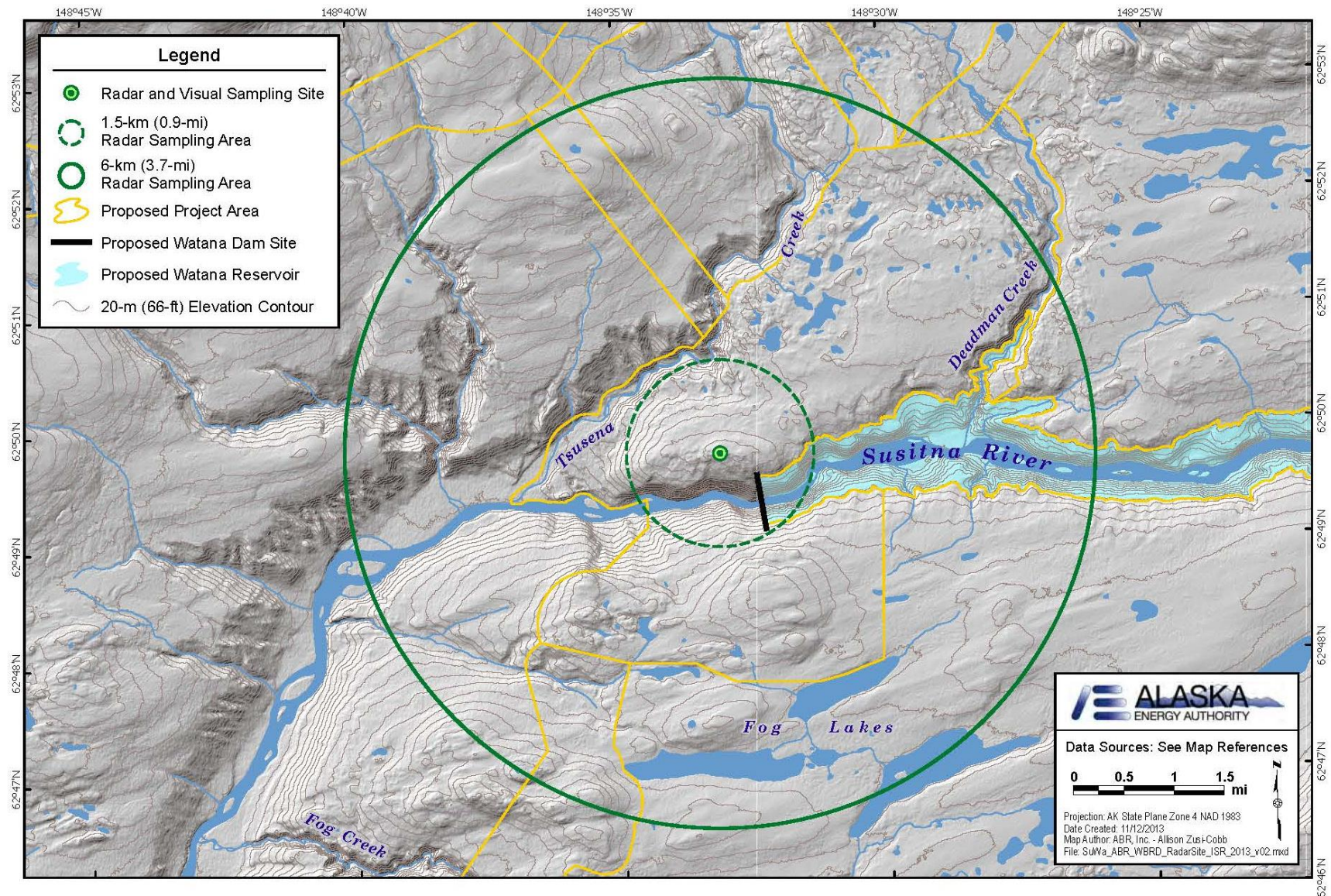


Figure 4.1-7. Radar and Visual Sampling Area for Ground-based Surveys of Migration, 2013.



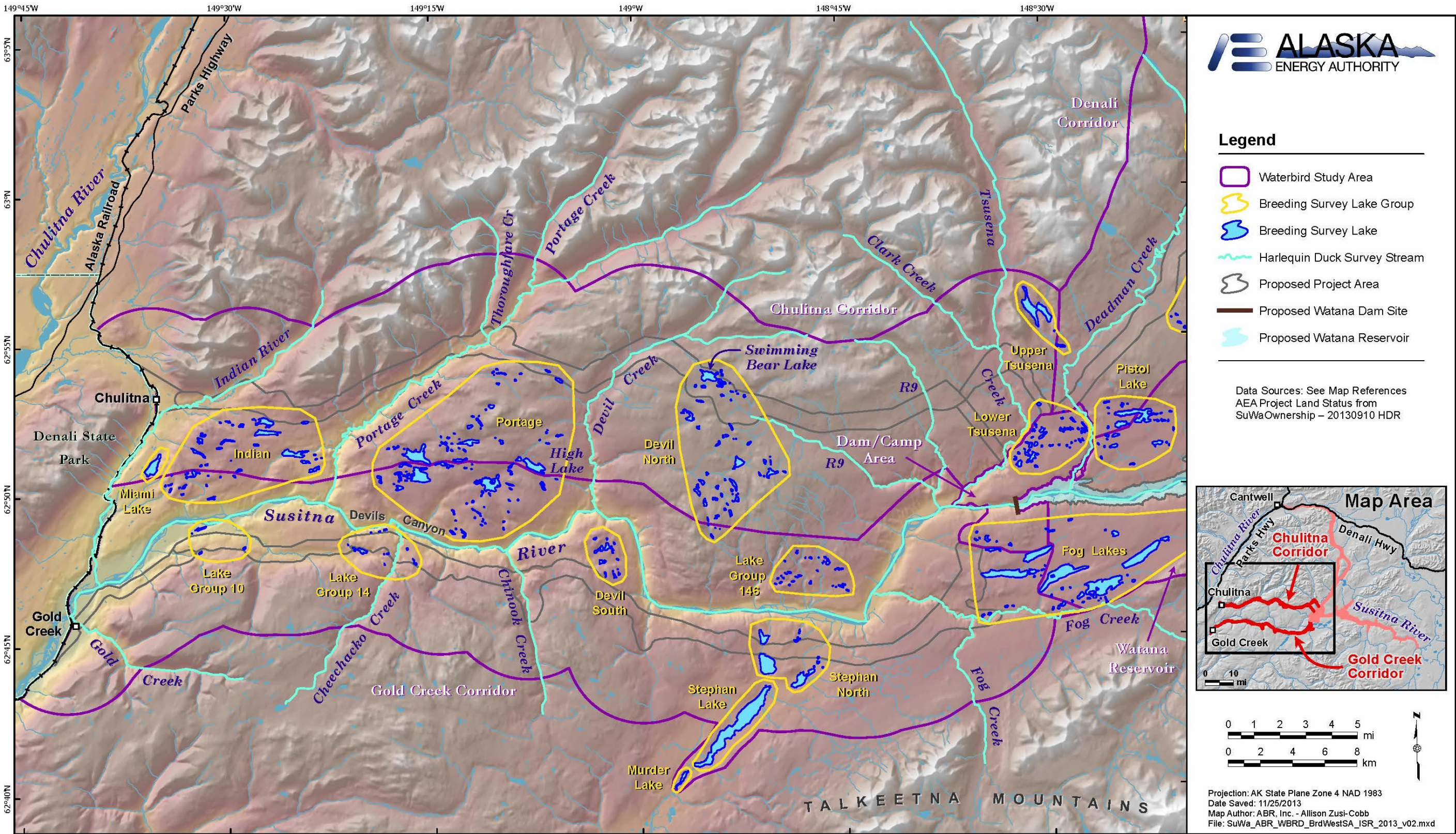


Figure 4.1-8. Water Bodies Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Chulitna and Gold Creek Corridors, 2013.



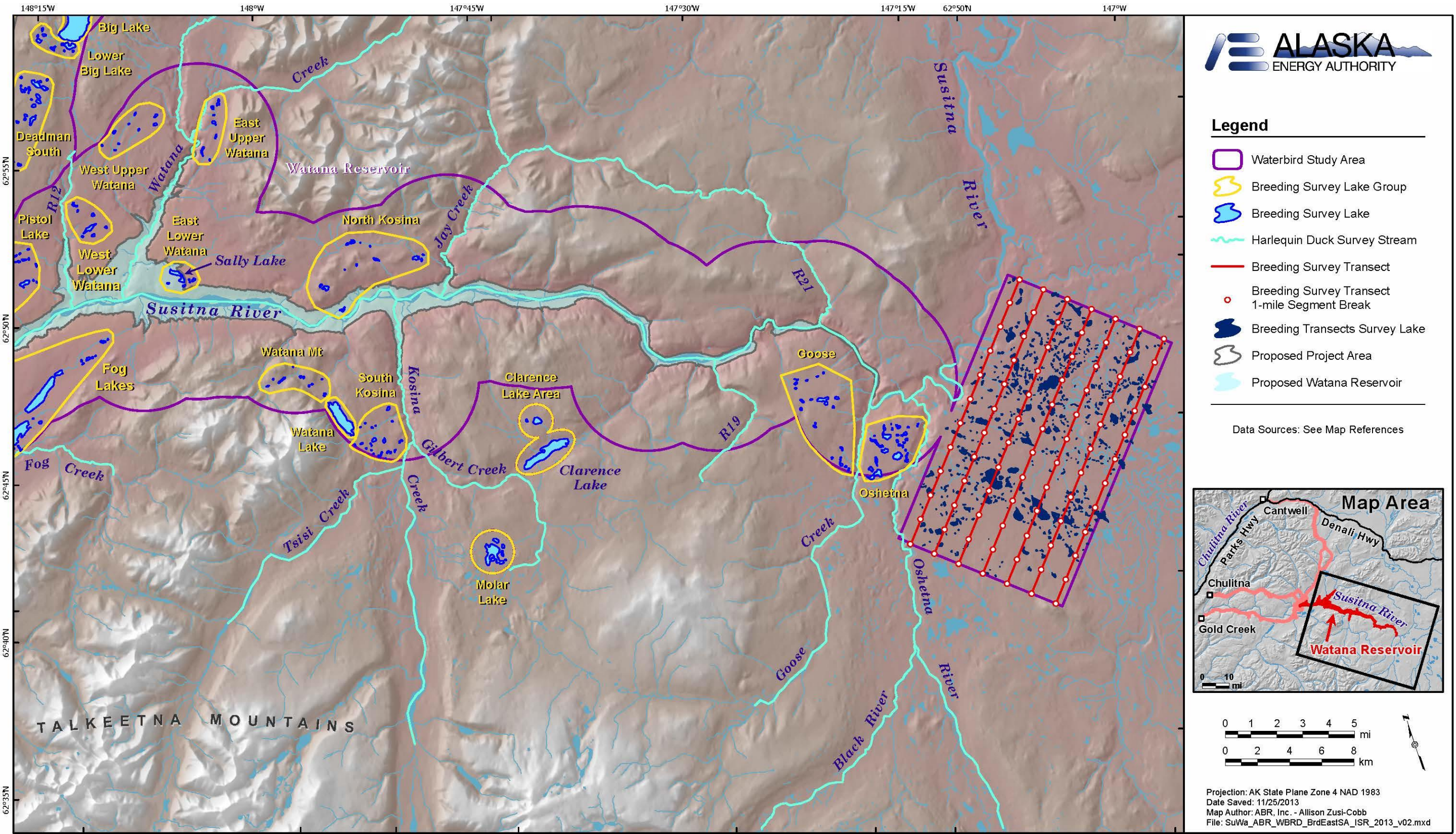


Figure 4.1-9. Water Bodies and Transect Lines Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Reservoir Inundation Zone and Vicinity, 2013.



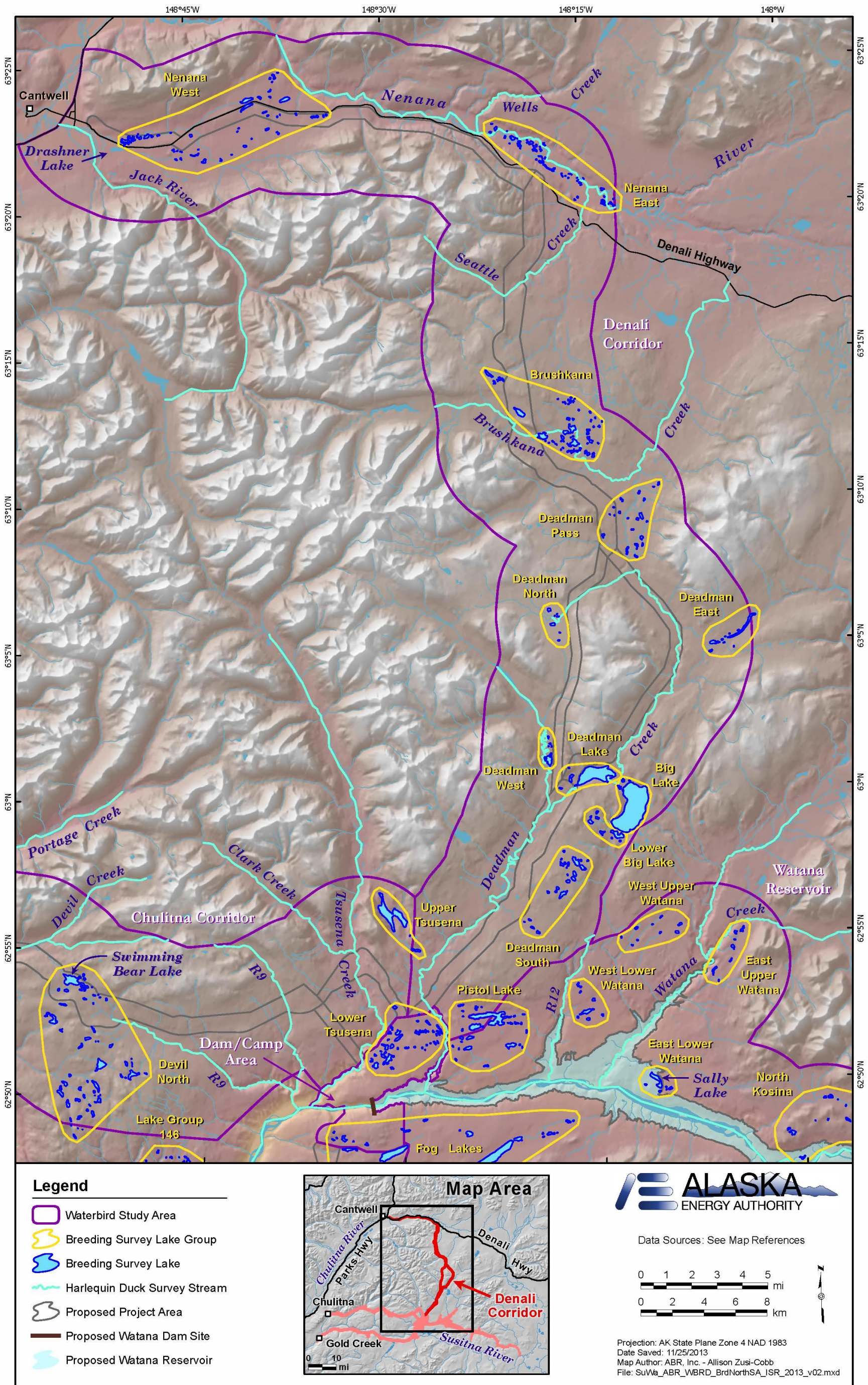


Figure 4.1-10. Water Bodies Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Denali West Corridor, 2013.



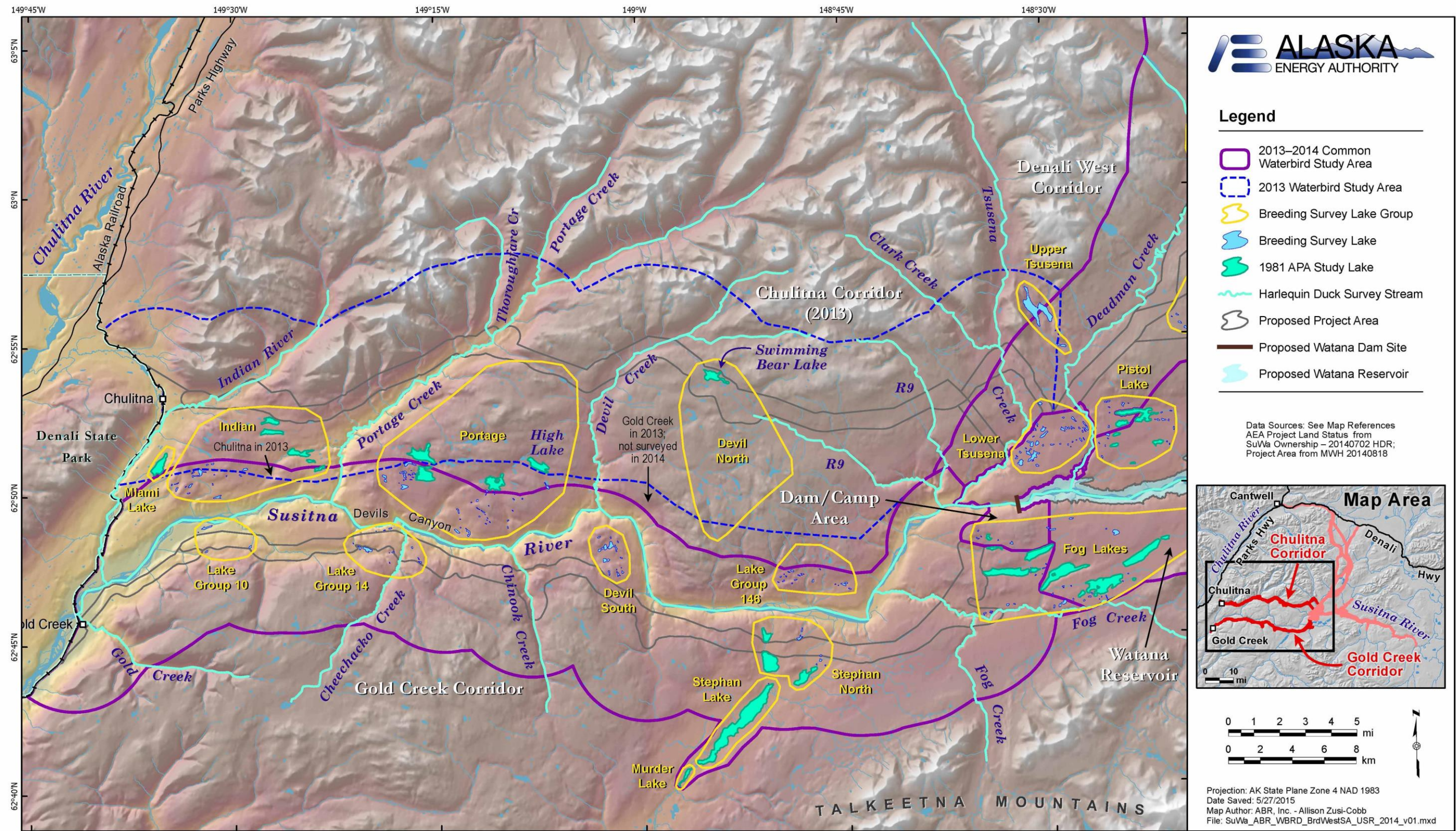


Figure 4.1-11. Water Bodies Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Chulitna and Gold Creek Corridors, 2014.



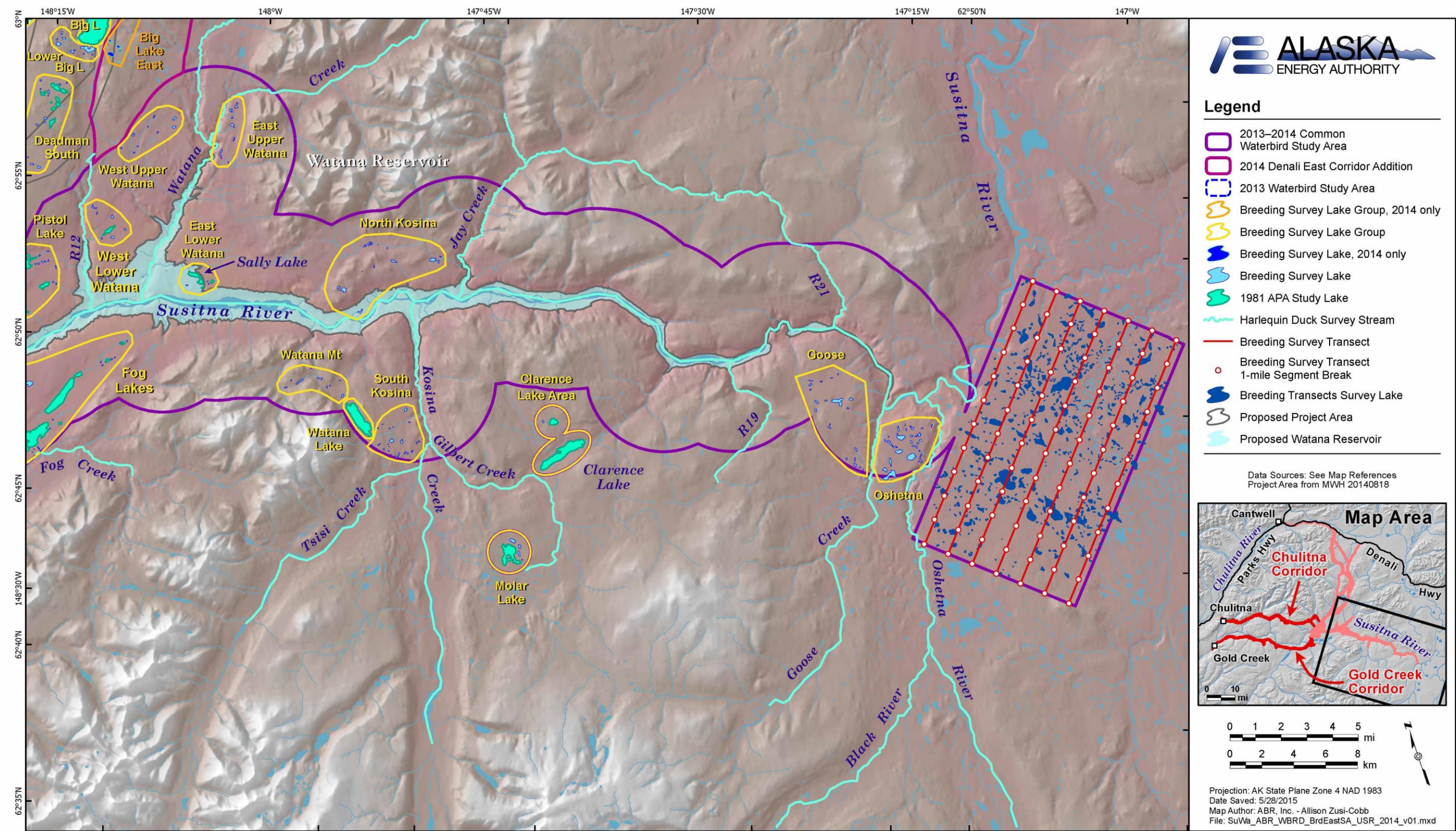


Figure 4.1-12. Water Bodies and Transect Lines Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Reservoir Inundation Zone and Vicinity, 2014.



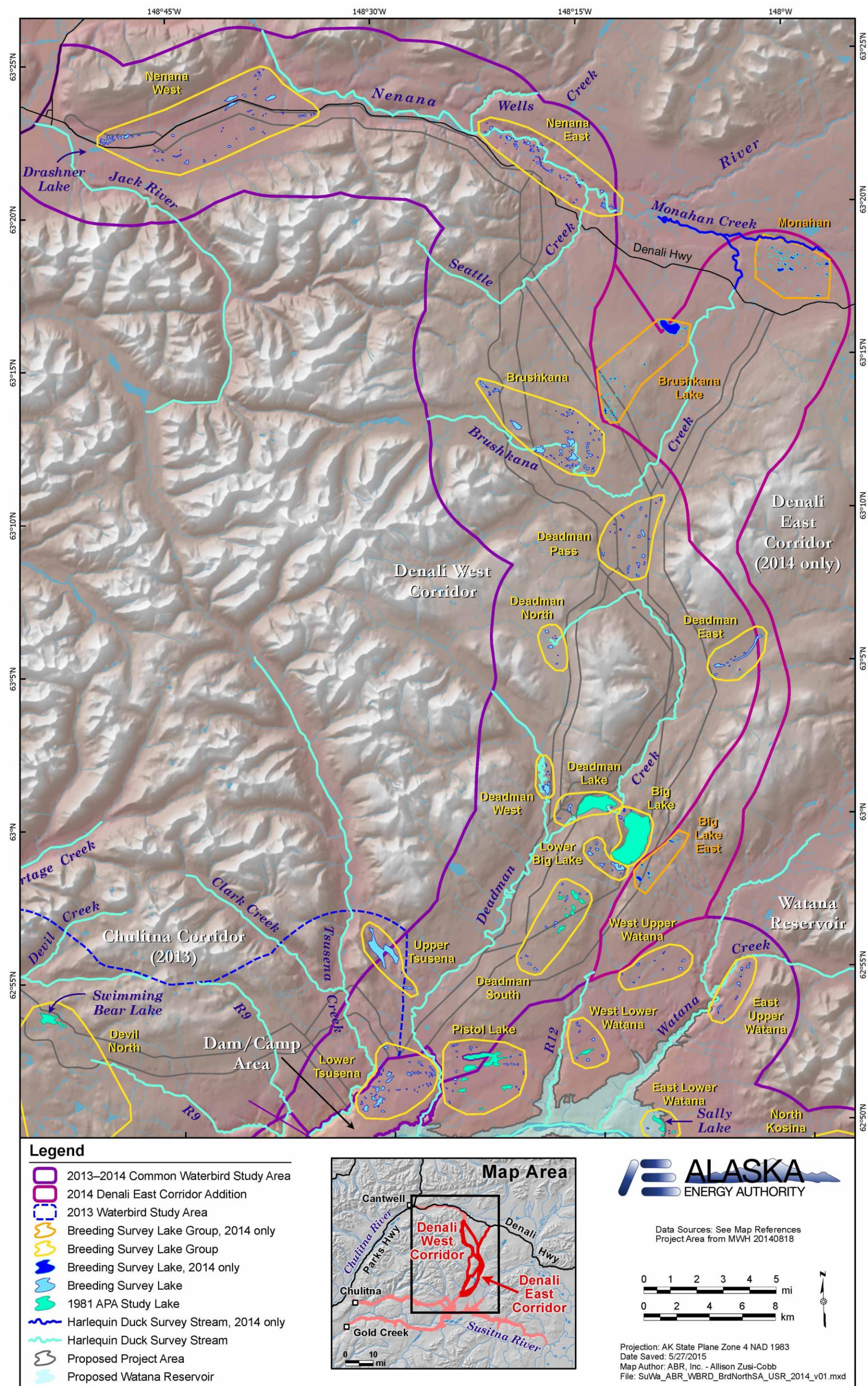


Figure 4.1-13. Water Bodies Surveyed for Breeding Waterbirds, and Streams Surveyed for Harlequin Ducks, in the Denali East and Denali West Corridors, 2014.



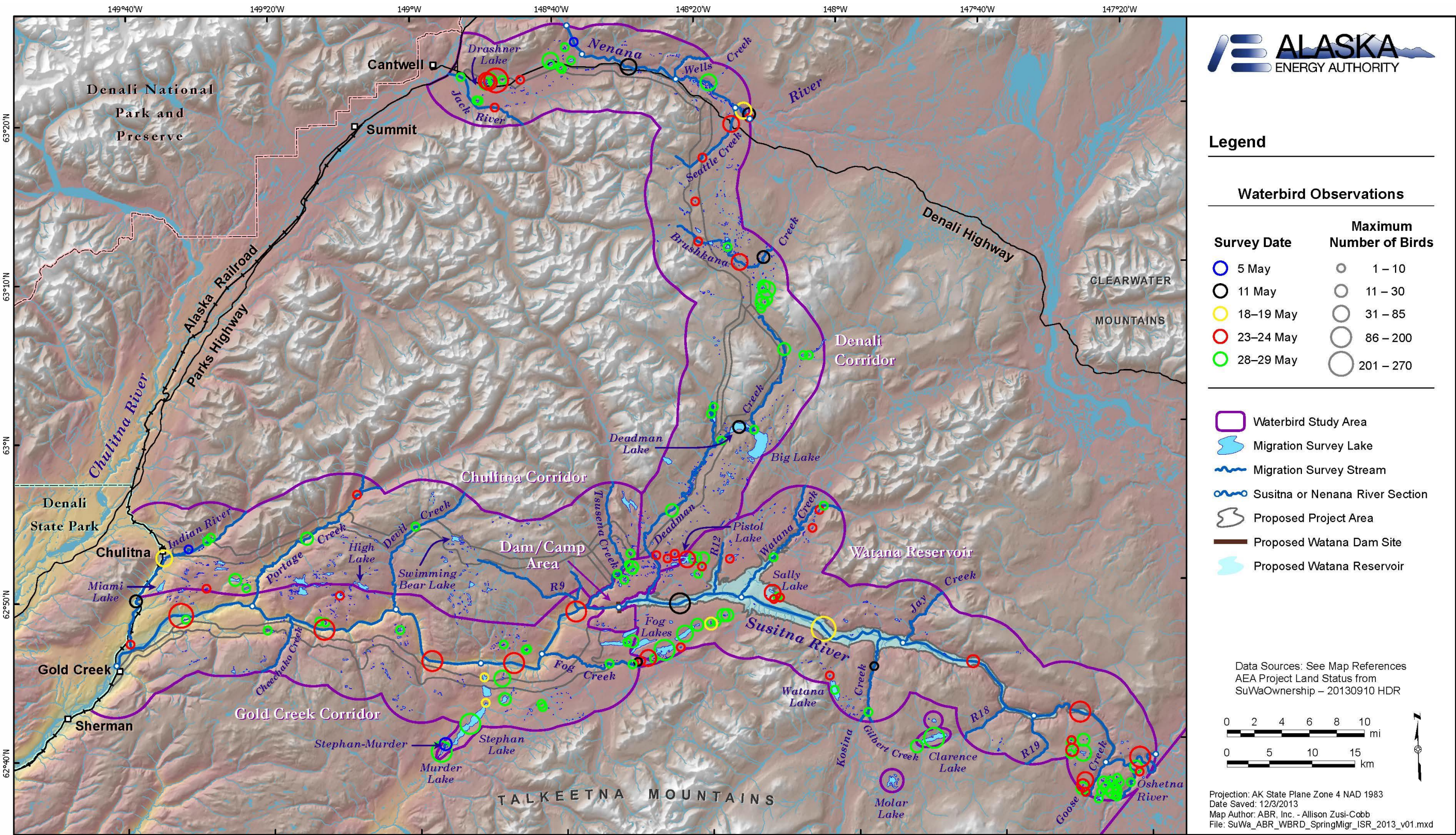


Figure 5.1-1. Locations and Maximum Numbers of Waterbirds Observed on Rivers and Water Bodies during Spring Migration Surveys, 2013. Locations are centerpoints of water bodies and midpoints of sections of river.



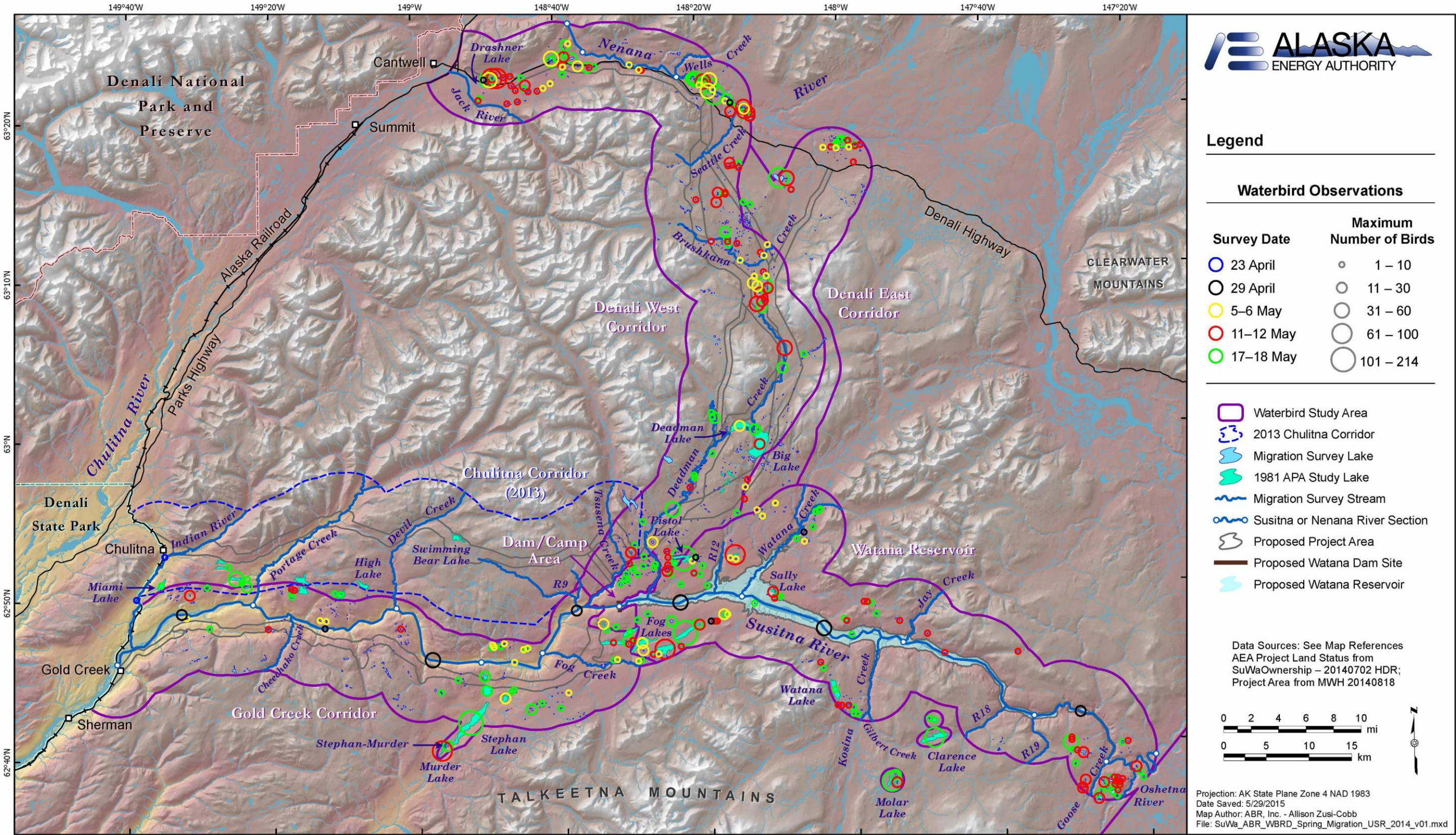


Figure 5.1-2. Locations and Maximum Numbers of Waterbirds Observed on Rivers and Water Bodies during Spring Migration Surveys, 2014. Locations are centerpoints of water bodies and midpoints of sections of river.



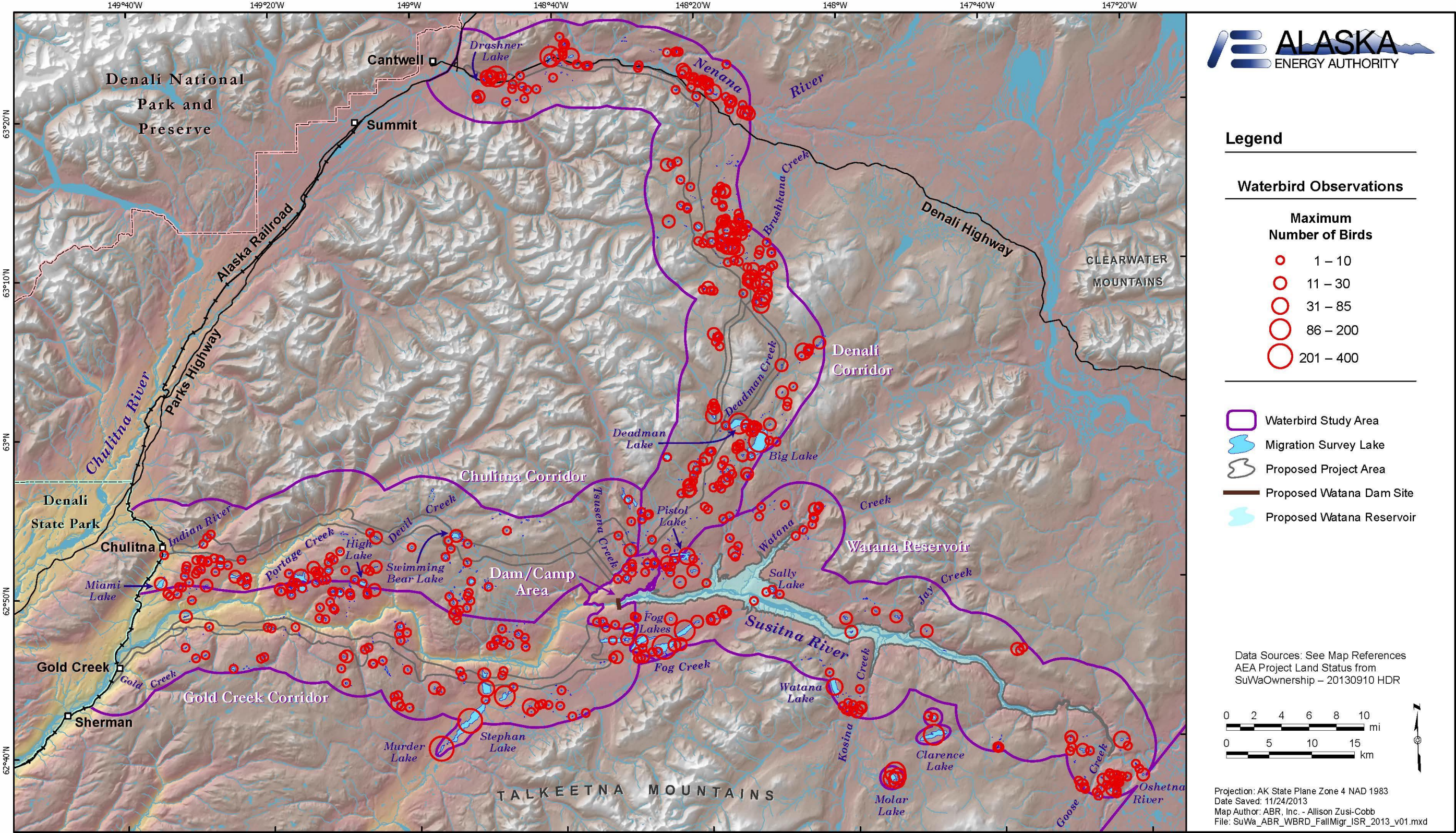


Figure 5.1-3. Locations and Maximum Numbers of Waterbirds Observed on Water Bodies during Fall Migration Surveys, 2013. Locations are centerpoints of water bodies.



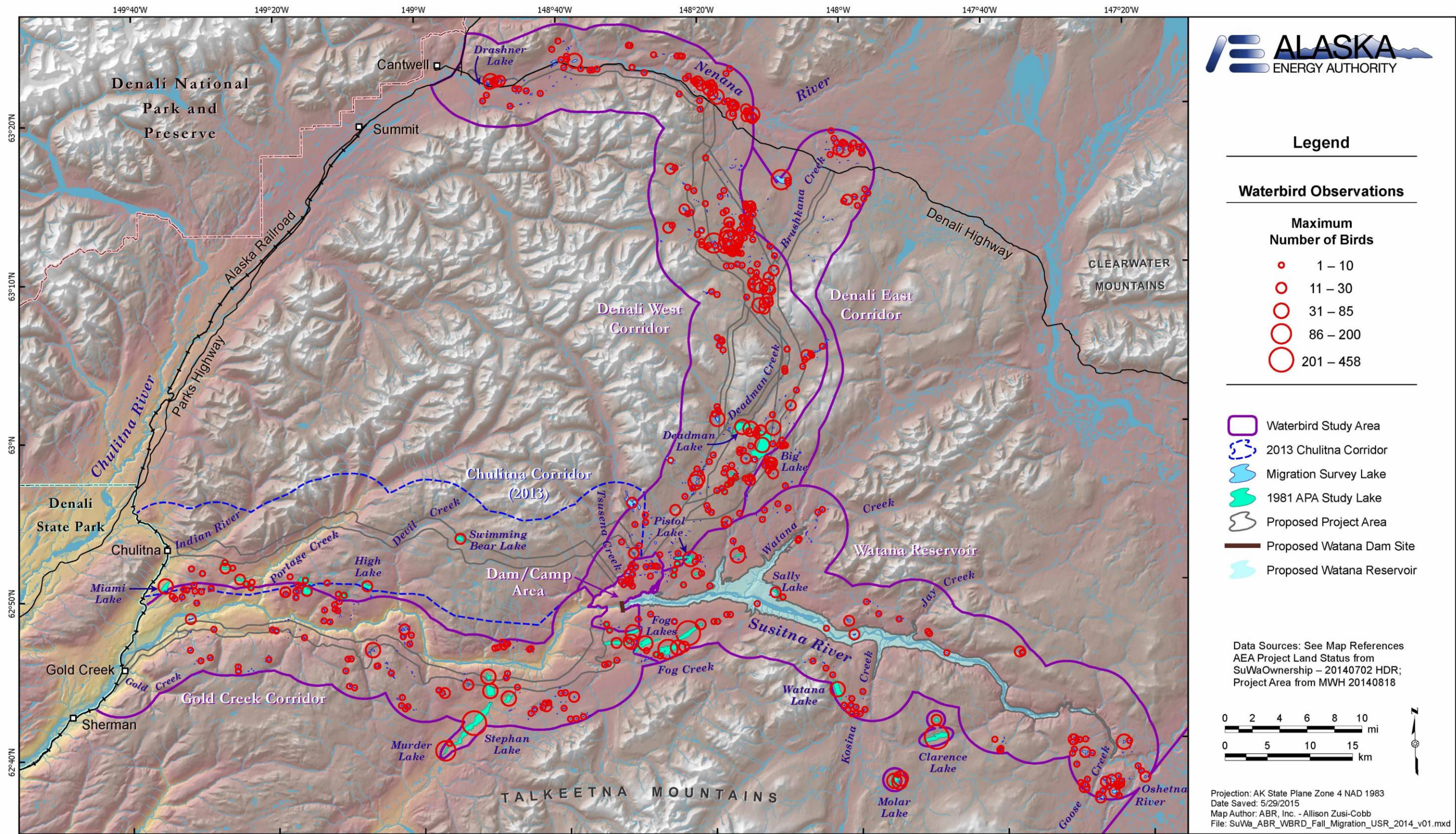
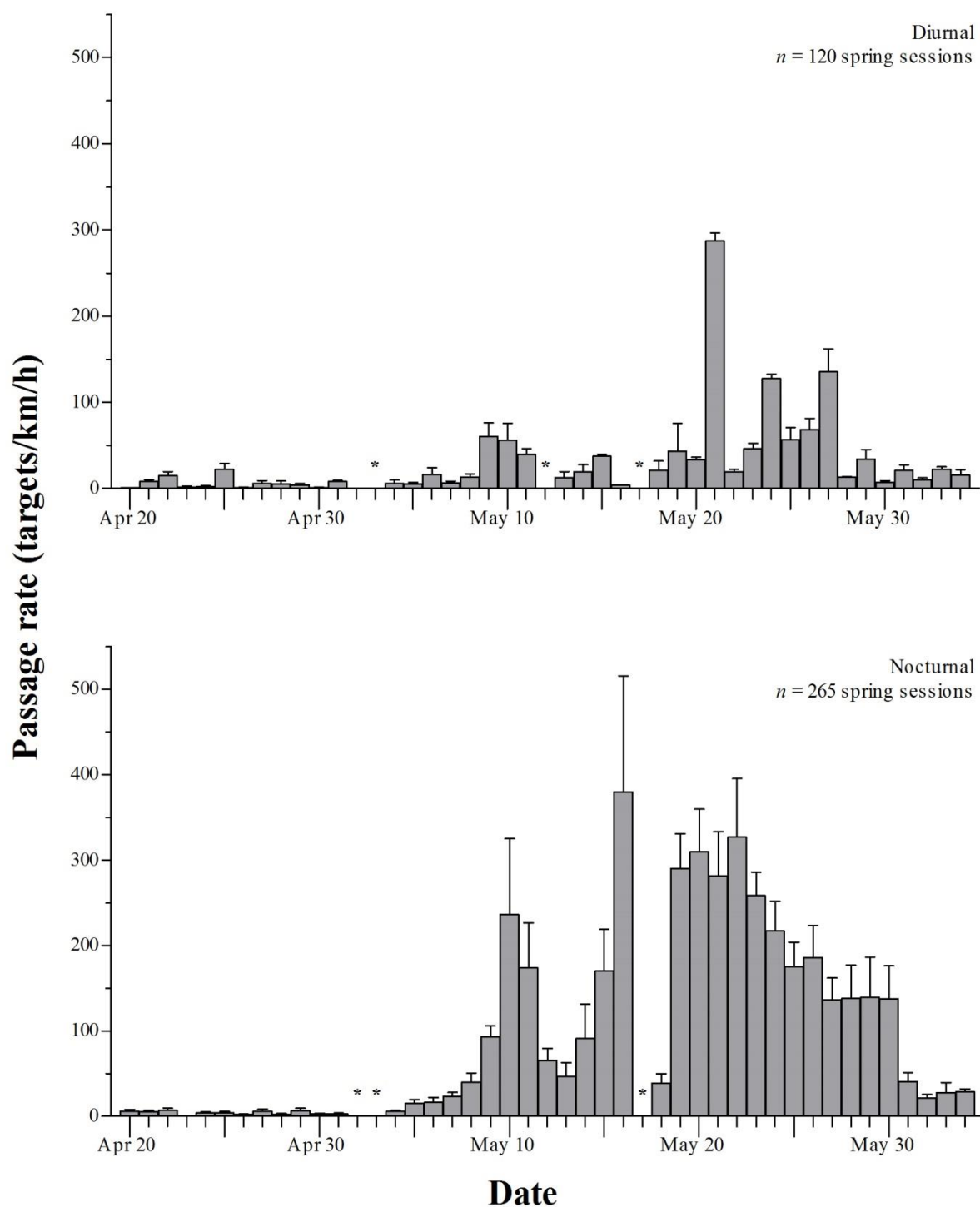


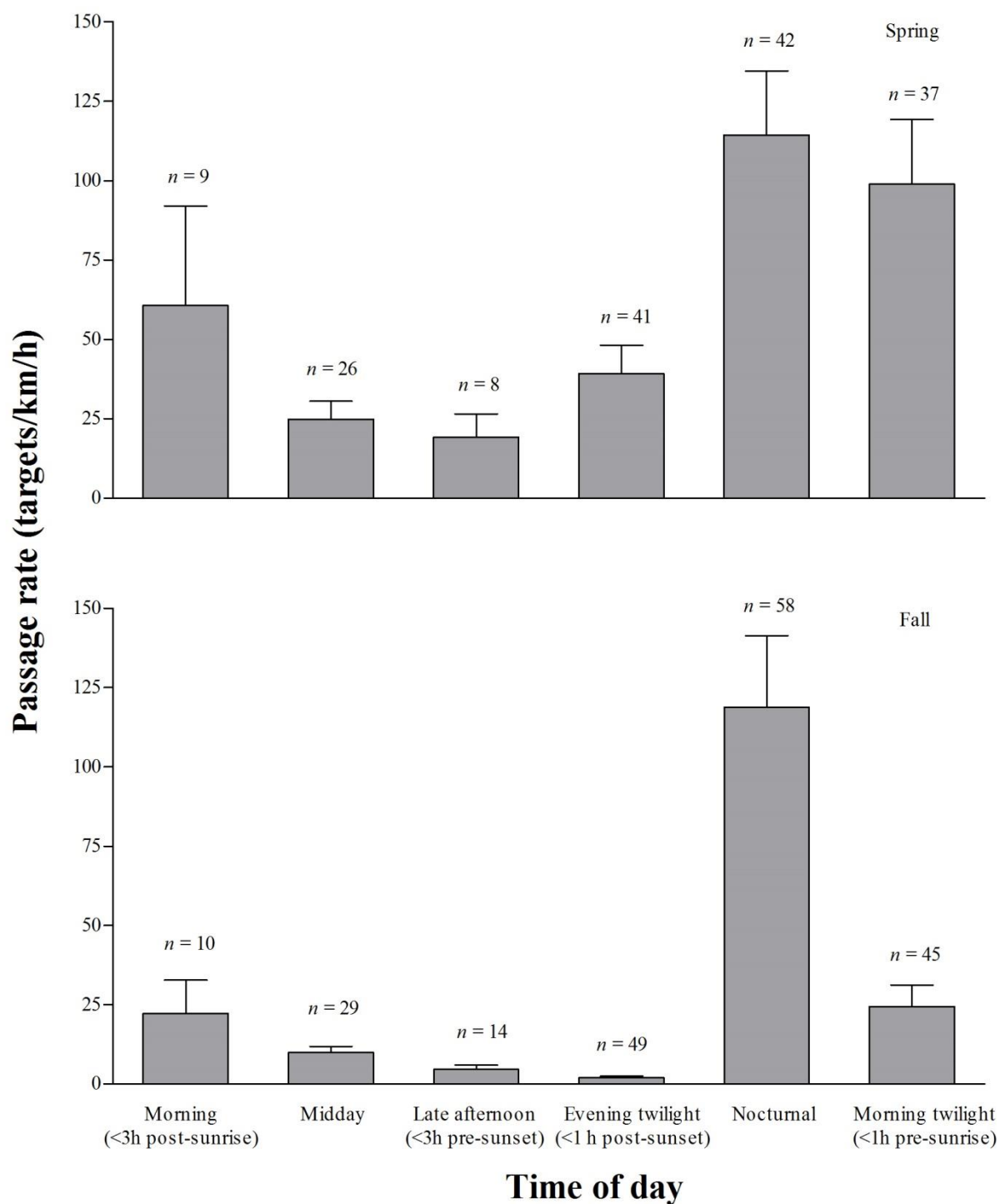
Figure 5.1-4. Locations and Maximum Number of Waterbirds Observed on Water Bodies during Fall Migration Surveys, 2014. Locations are centerpoints of water bodies.





**Figure 5.1-5. Spring Diurnal and Nocturnal Passage Rates (mean  $\pm$  SE) by Date for Targets Detected within the 1.5-km Radar Range. Asterisks indicate that no radar sampling occurred due to weather.**





**Figure 5.1-6. Passage Rates (mean  $\pm$  SE) of Targets, Grouped by Time of Day, during Spring and Fall Migration, for Targets Detected within the 1.5-km Radar Range.**



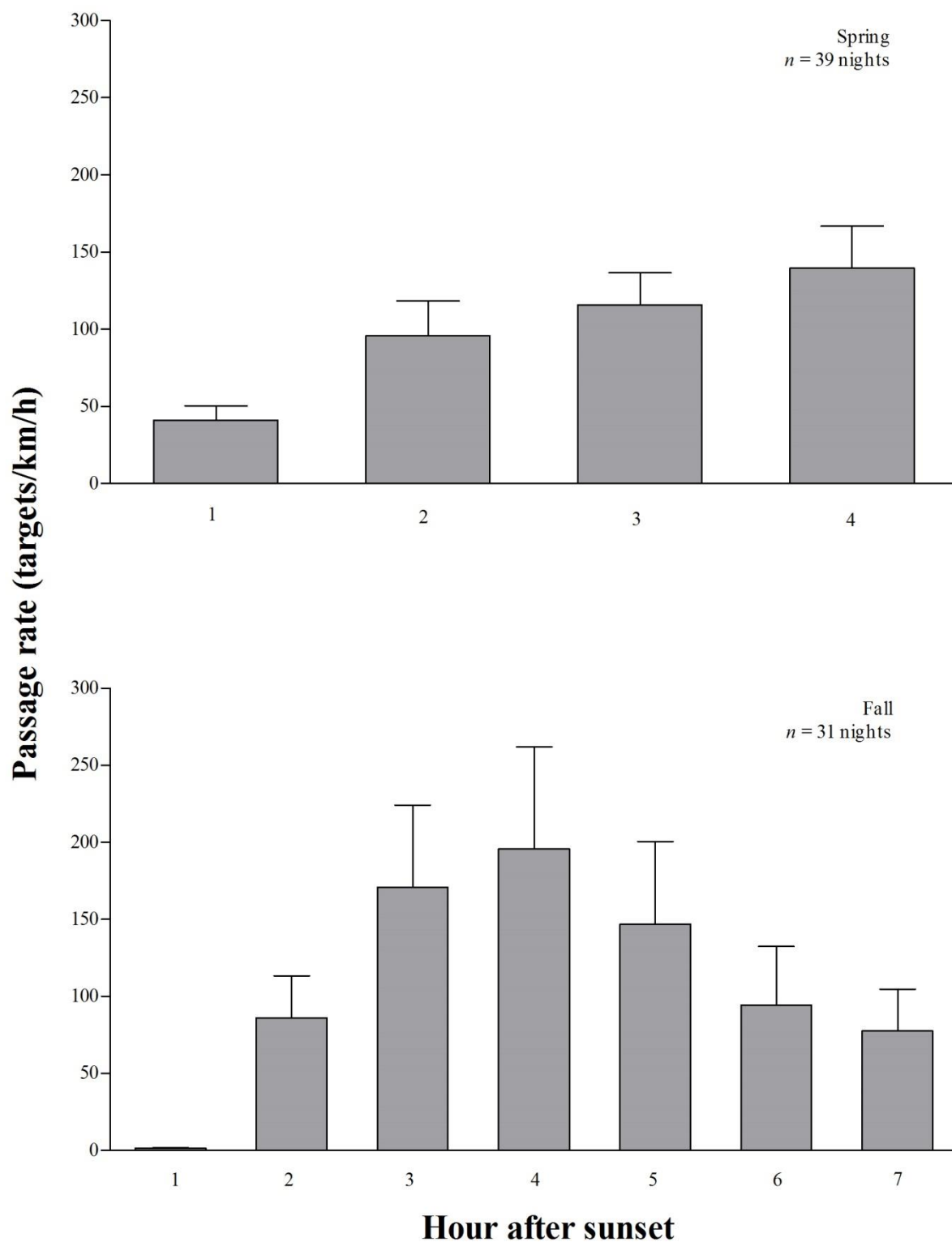


Figure 5.1-7. Passage Rates (mean  $\pm$  SE) Relative to Hour Post-Sunset During Spring and Fall Migration, for Targets Detected within the 1.5-km Radar Range.



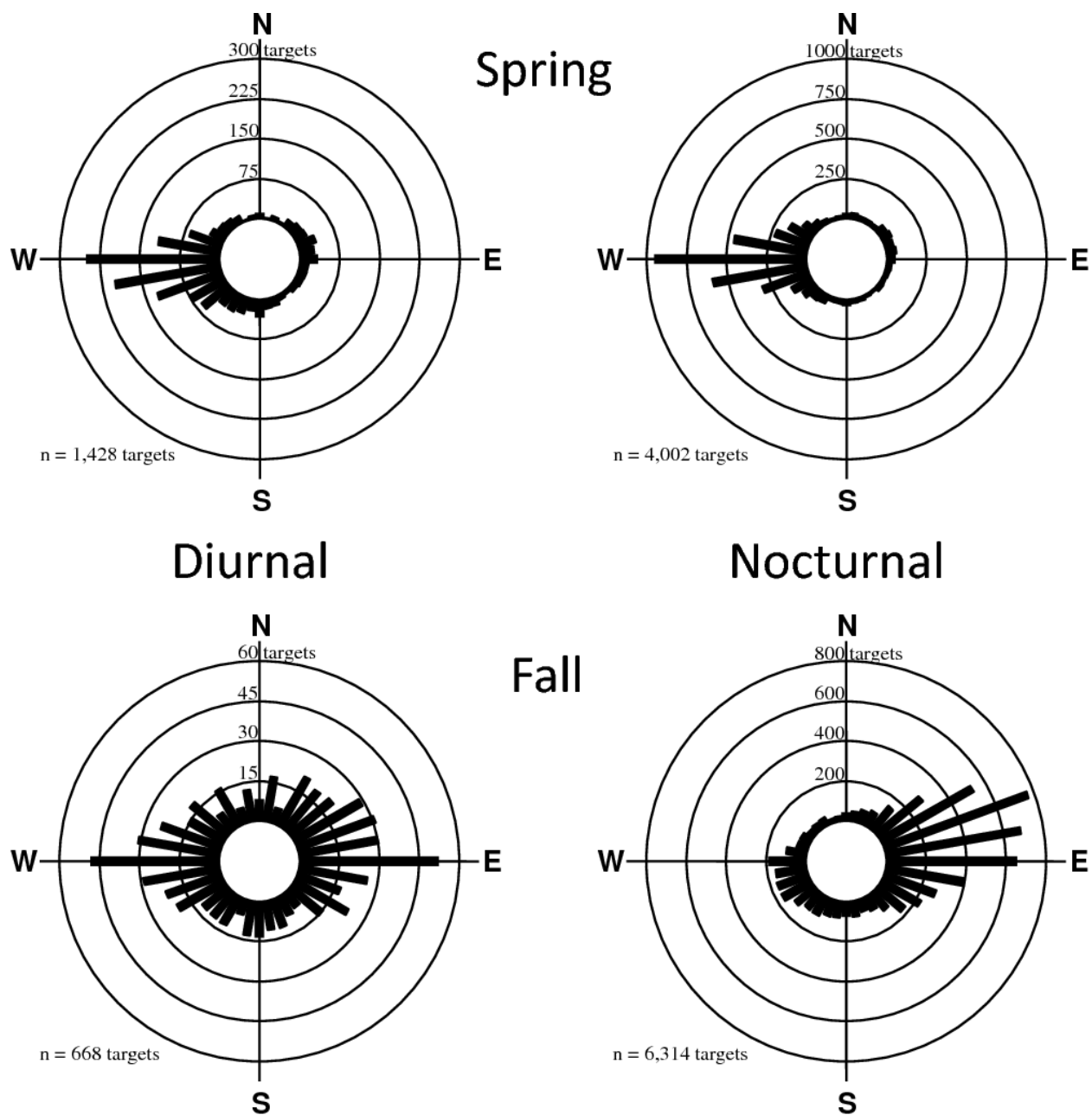
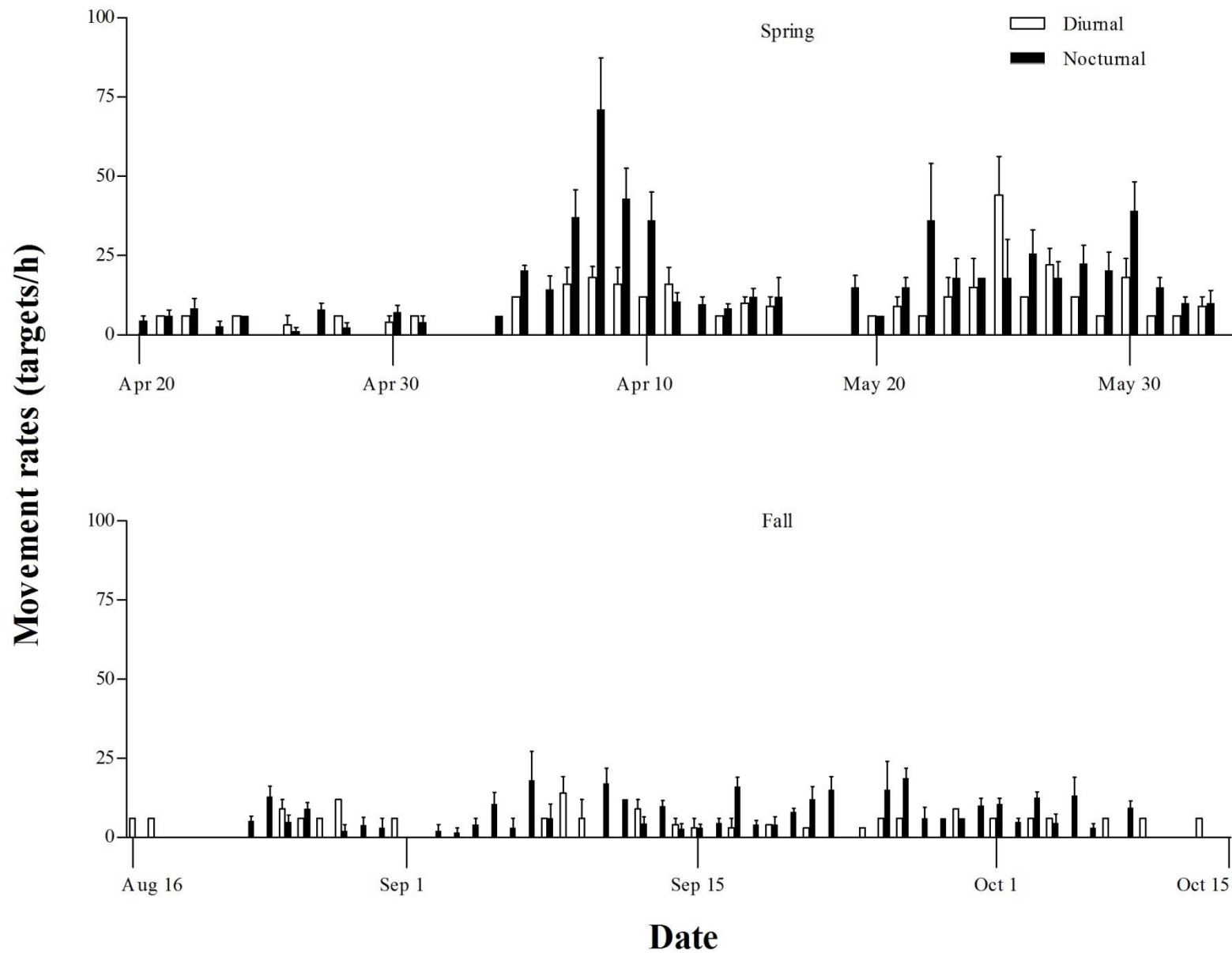


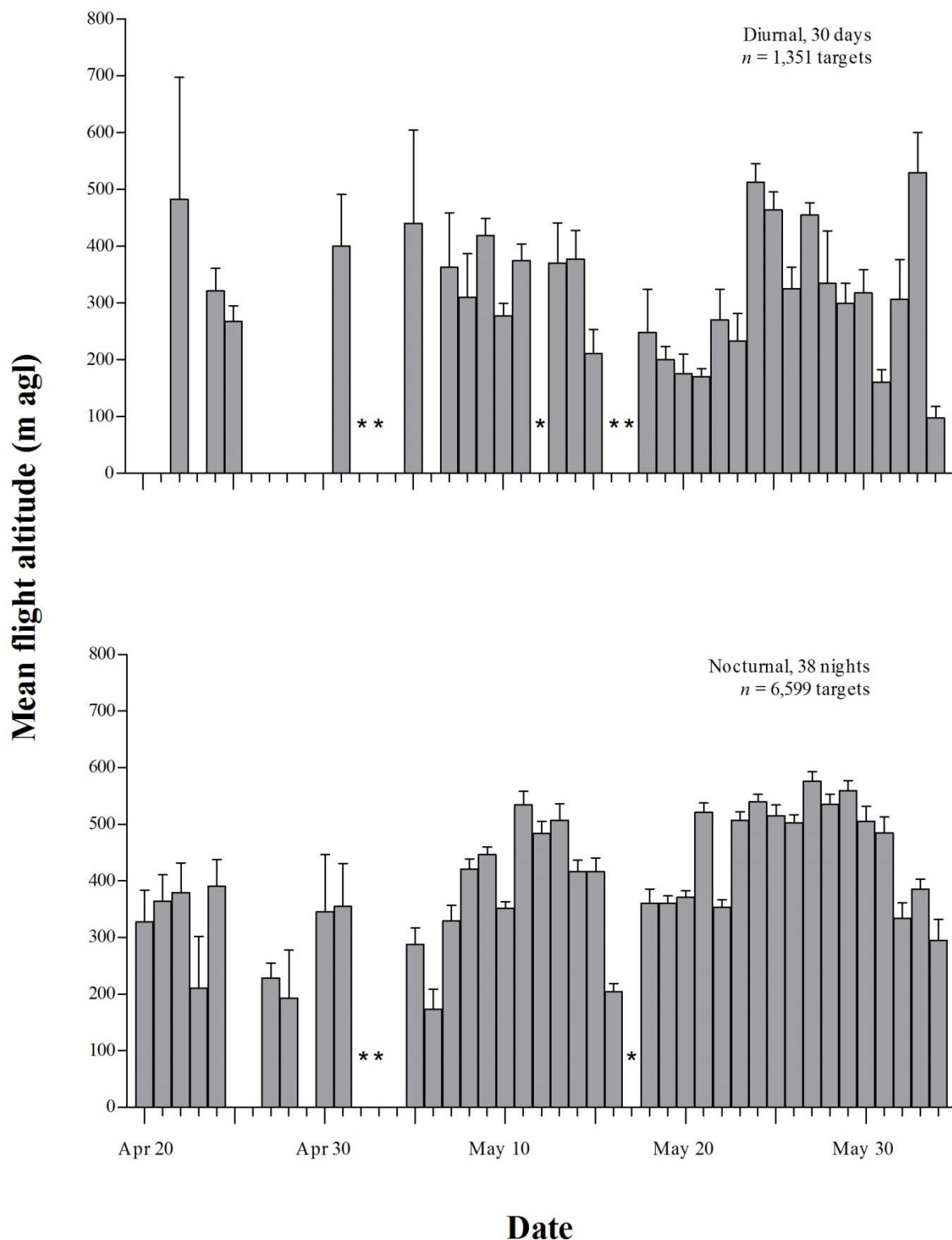
Figure 5.1-8. Diurnal and Nocturnal Flight Directions of Targets Detected within the 1.5-km Radar Range.





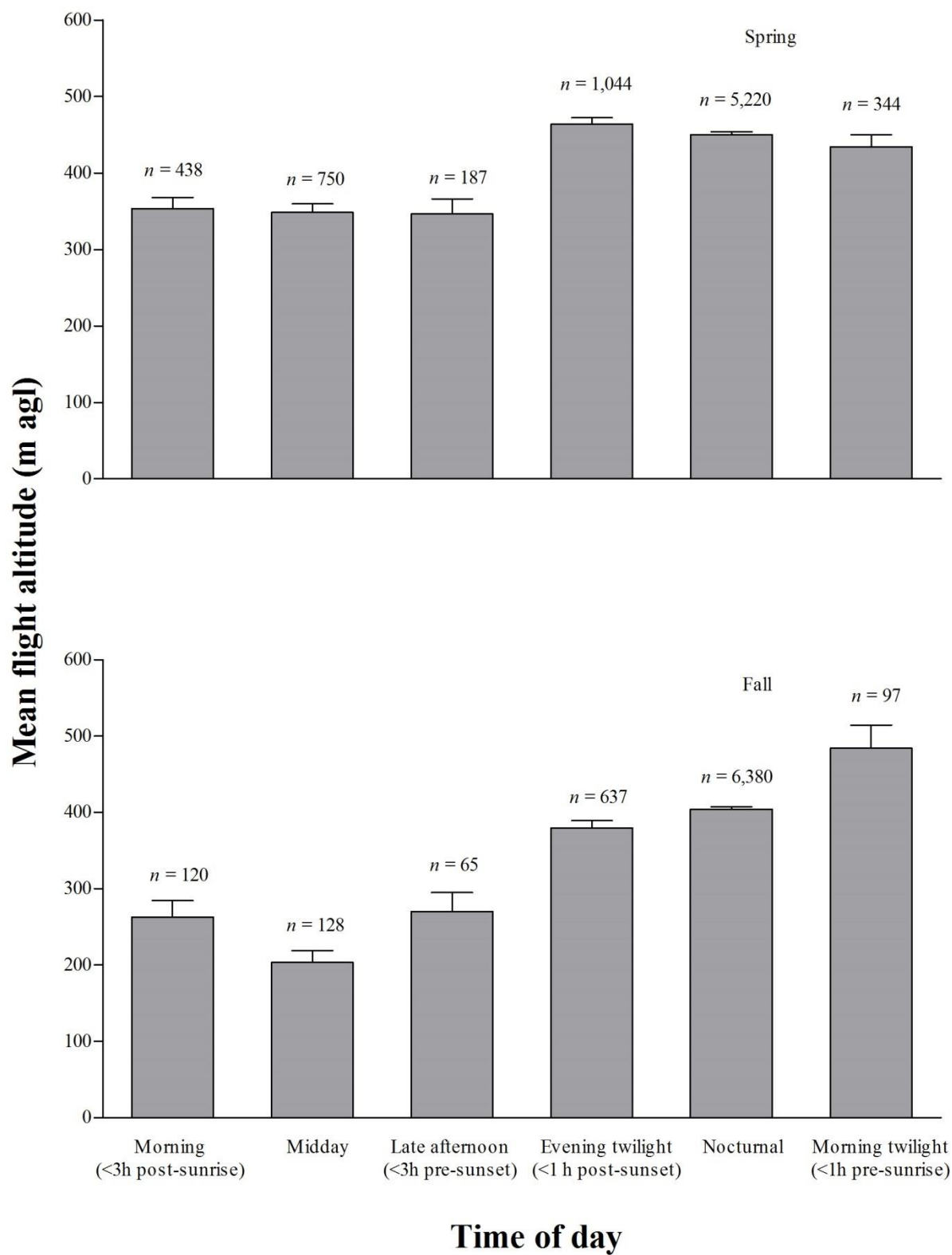
**Figure 5.1-9. Radar Targets Detected >1.5 km from the Sampling Station during Spring and Fall Migration.**





**Figure 5.1-10. Mean Diurnal and Nocturnal Flight Altitudes (m agl) of Targets during Spring Migration, by Date for Targets Detected within the 1.5-km Radar Range. Asterisks (\*) indicate that no radar sampling occurred (due to weather), and blanks indicate dates with sample sizes too small (<5 targets) to calculate meaningful values.**





**Figure 5.1-11. Mean Flight Altitudes (m agl) of Targets, Grouped by Time of Day, during Spring and Fall Migration for Targets Detected within the 1.5-km Radar Range.**



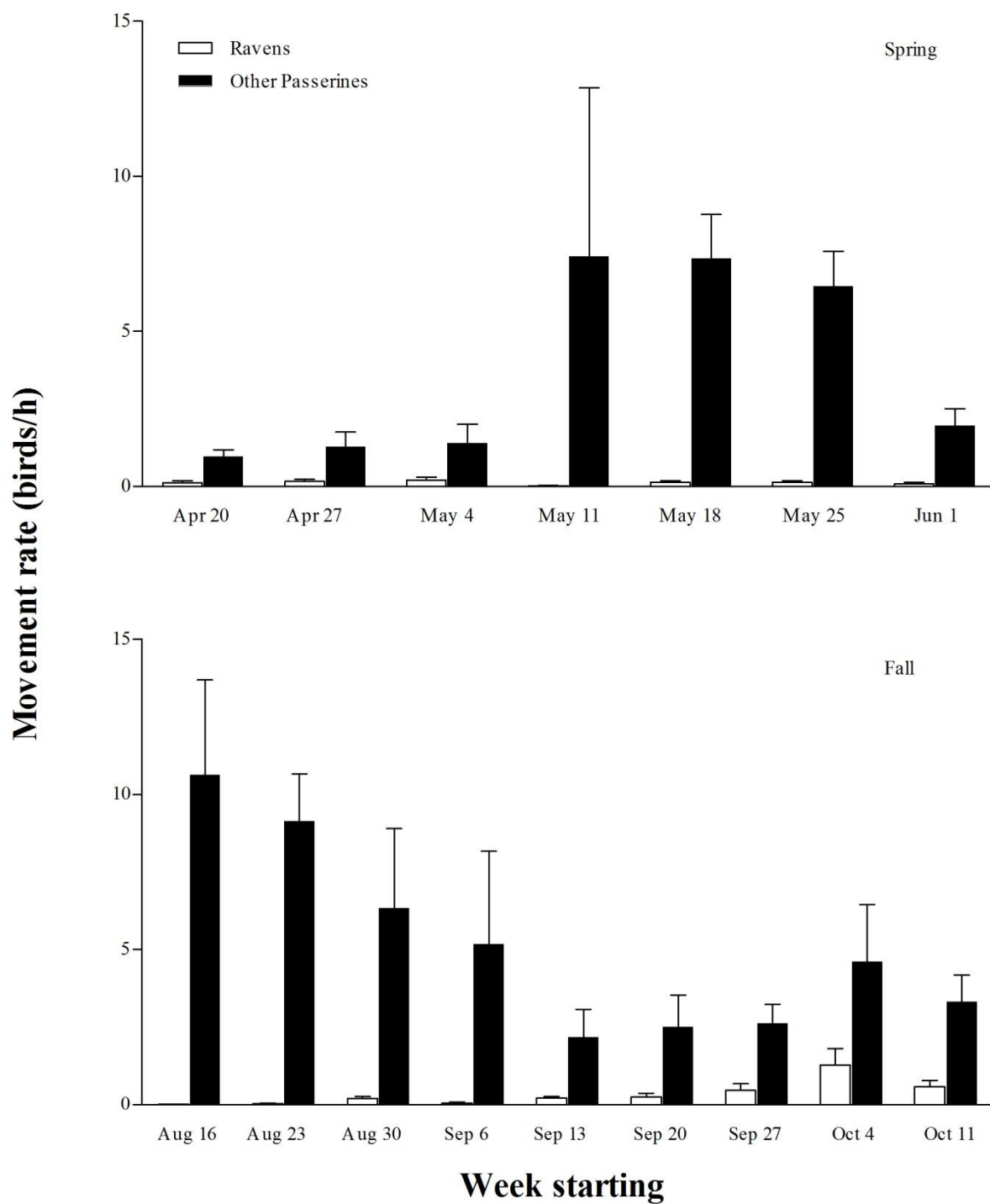


Figure 5.1-12. Mean Movement Rates (birds/h) of Passerines by Week of the Spring and Fall Migration Survey Seasons.



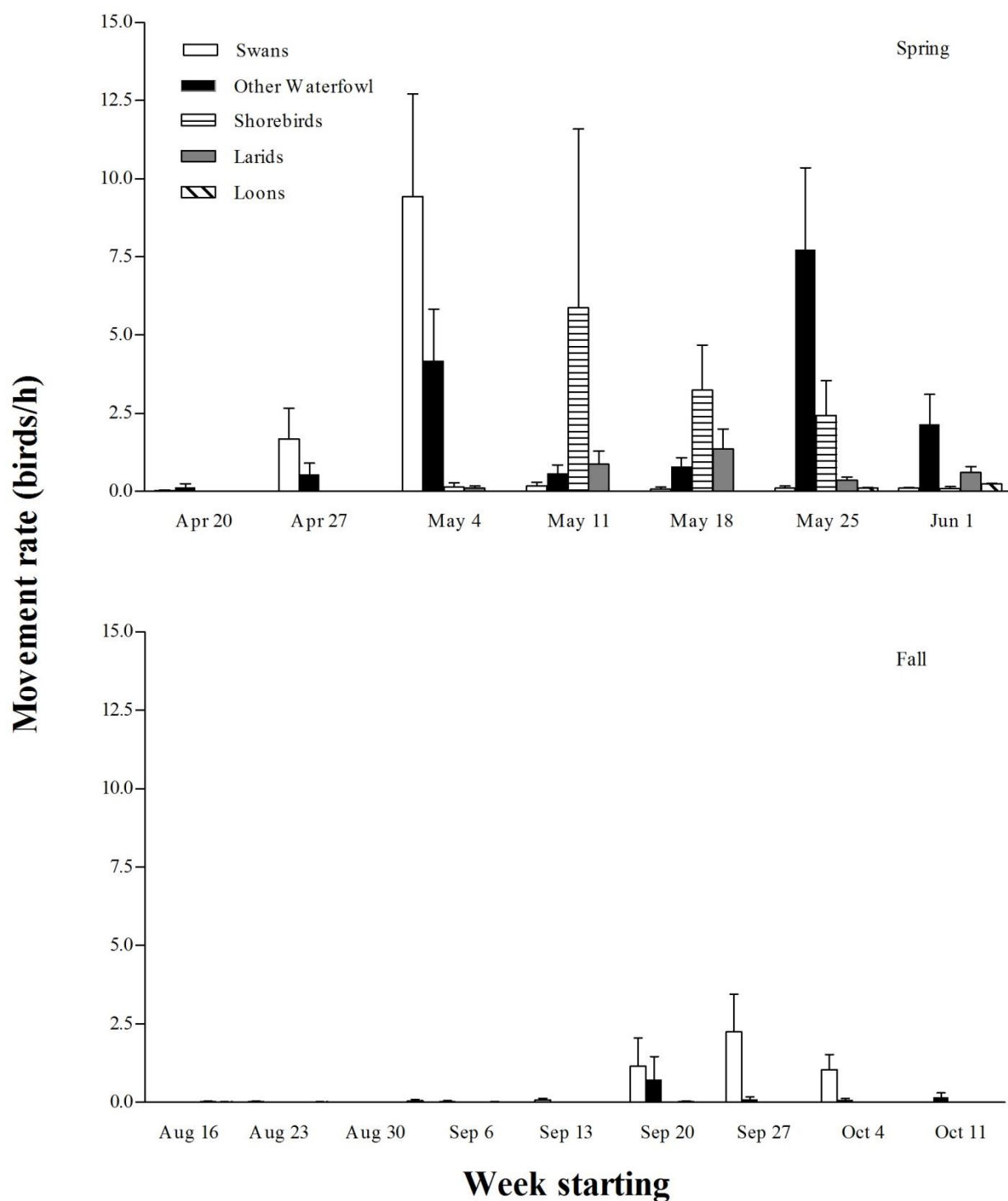


Figure 5.1-13. Mean Movement Rates (birds/h) of Waterbirds by Week of the Spring and Fall Migration Survey Seasons.



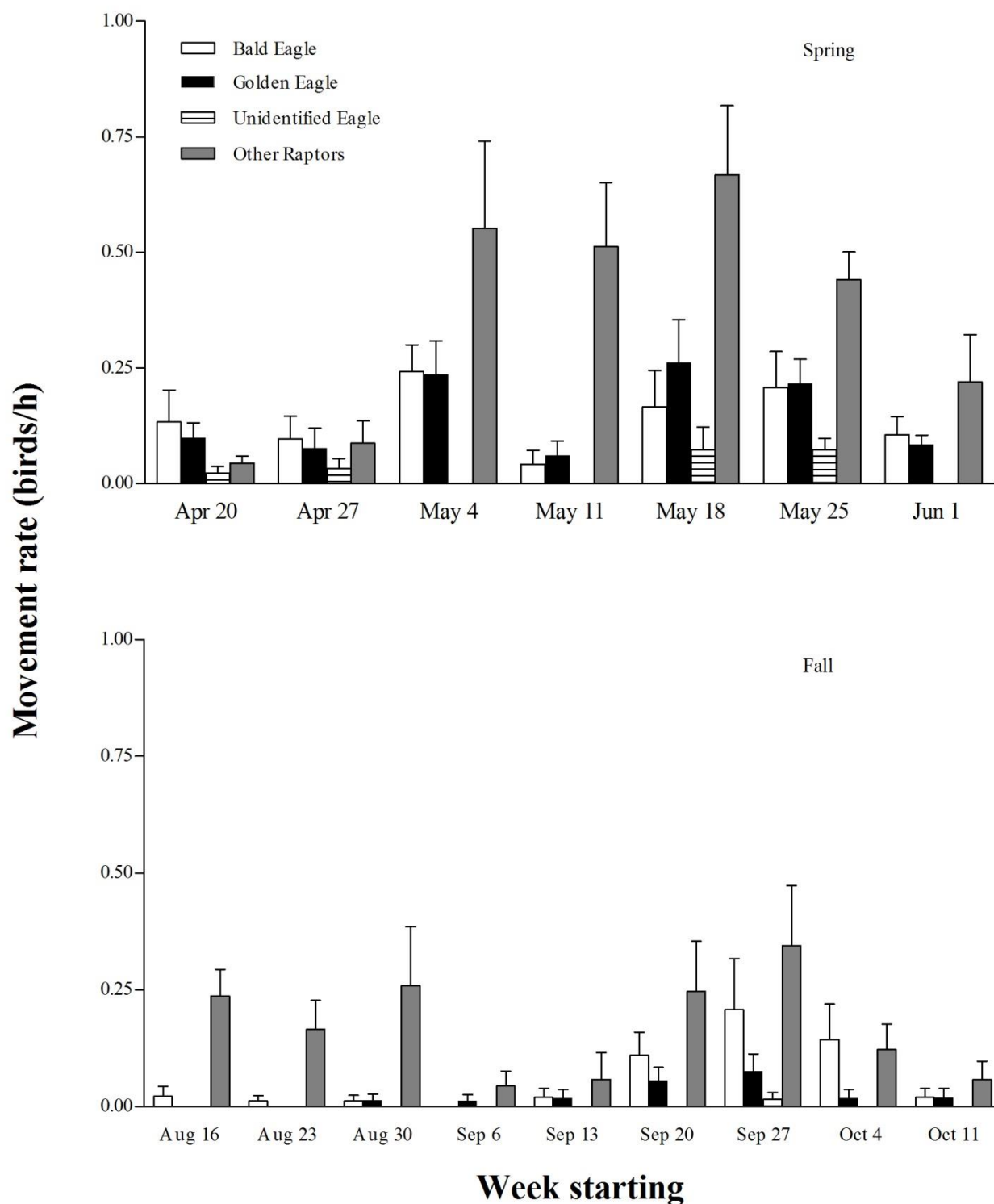
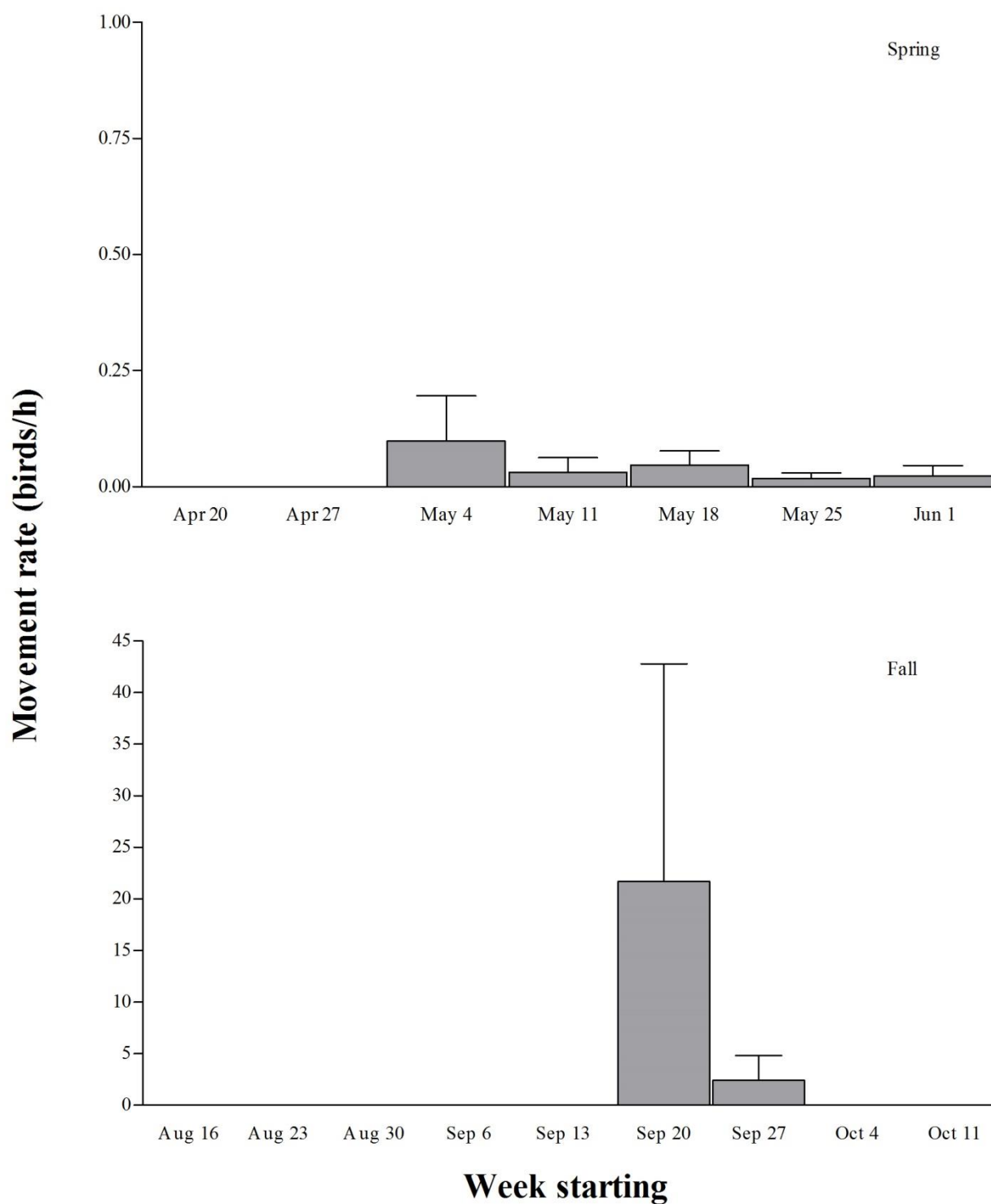


Figure 5.1-14. Mean Movement Rates (birds/h) of Raptors by Week of the Spring and Fall Migration Survey Seasons.





**Figure 5.1-15. Mean Movement Rates (birds/h) of Sandhill Cranes by Week of the Spring and Fall Migration Survey Seasons.**



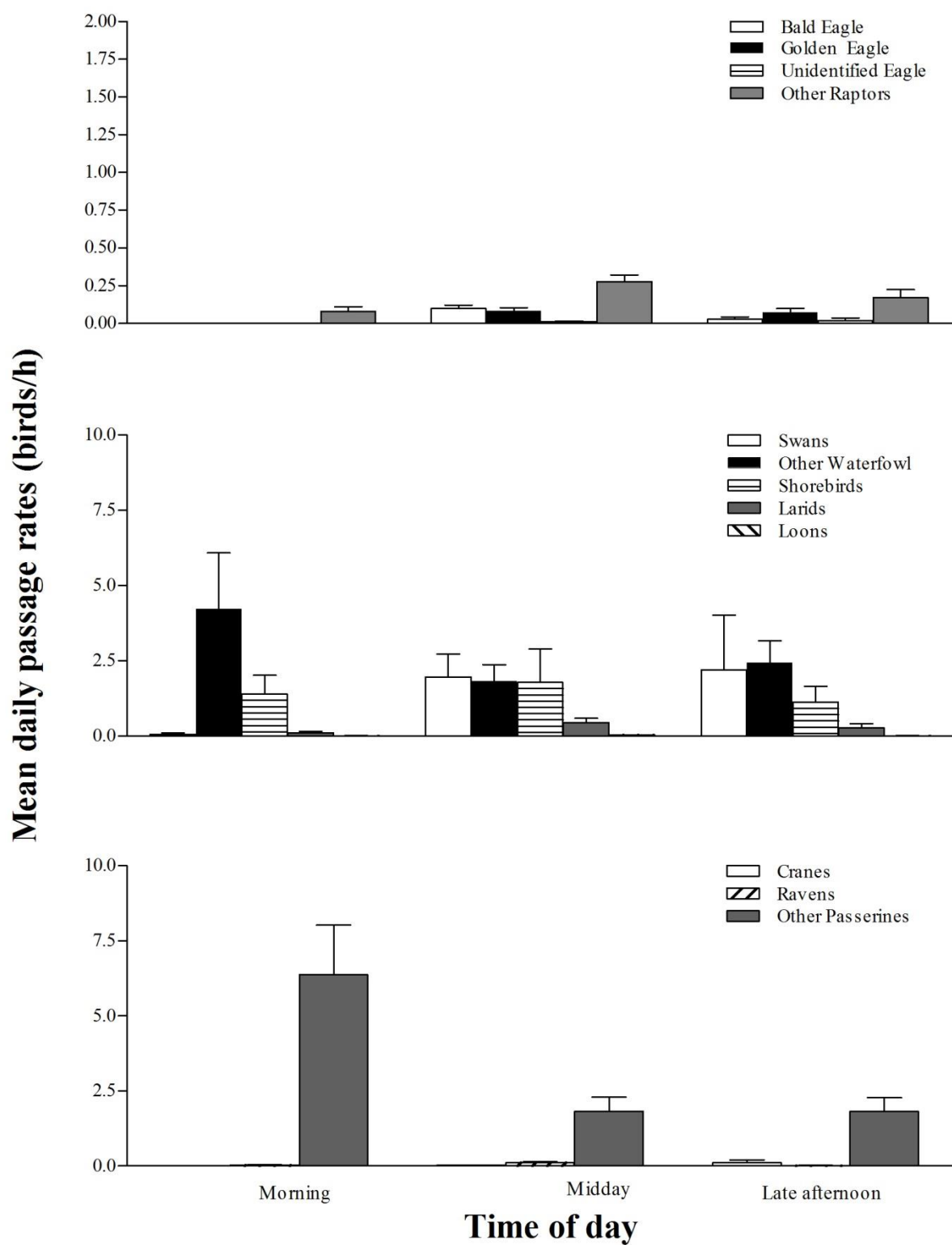


Figure 5.1-16. Mean Movement Rates (birds/h) of Bird Groups by Time of Day during Spring Migration Survey Season.



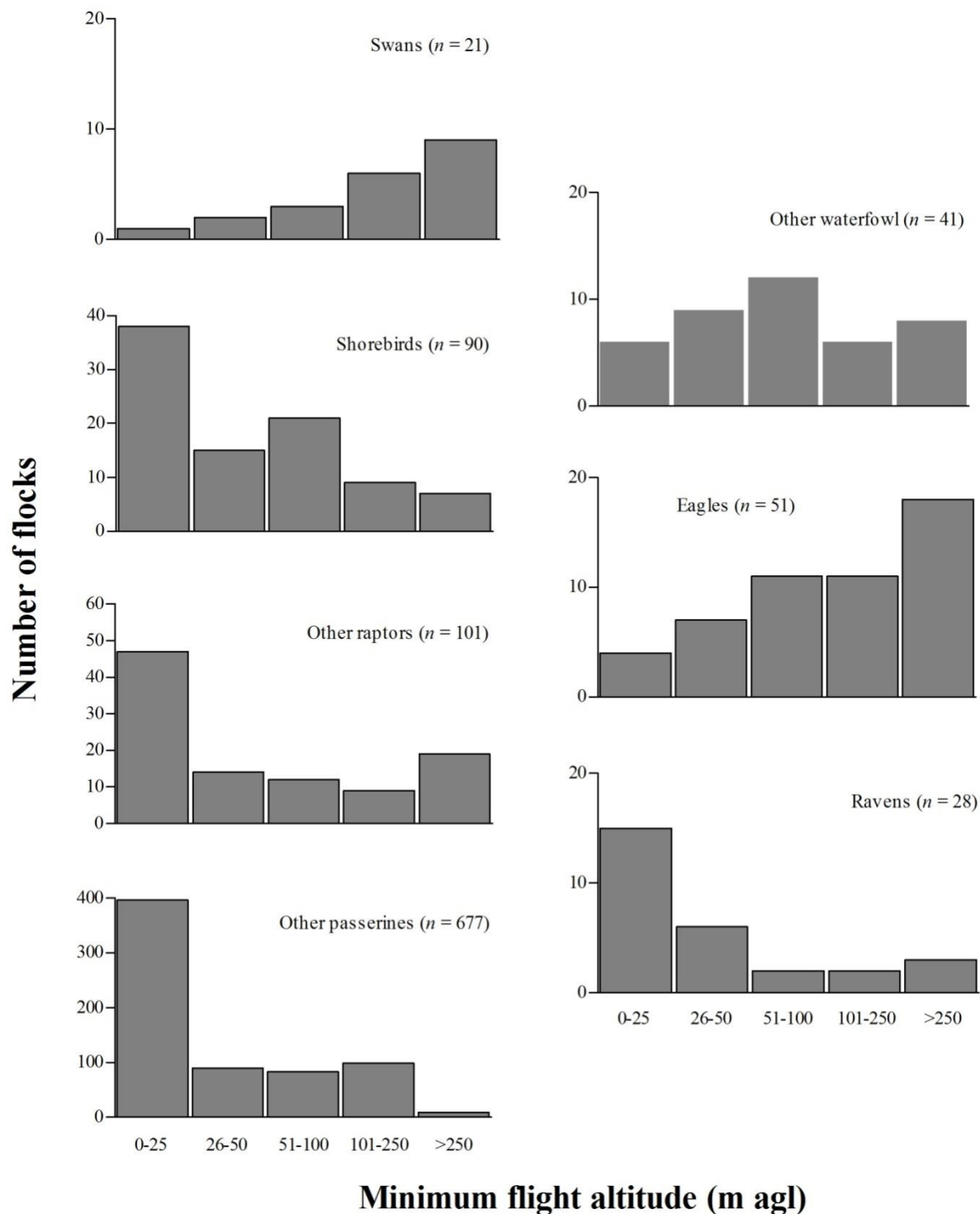


Figure 5.1-17. Flight Altitude Categories for Species Groups Observed during Diurnal Visual Surveys in Spring.



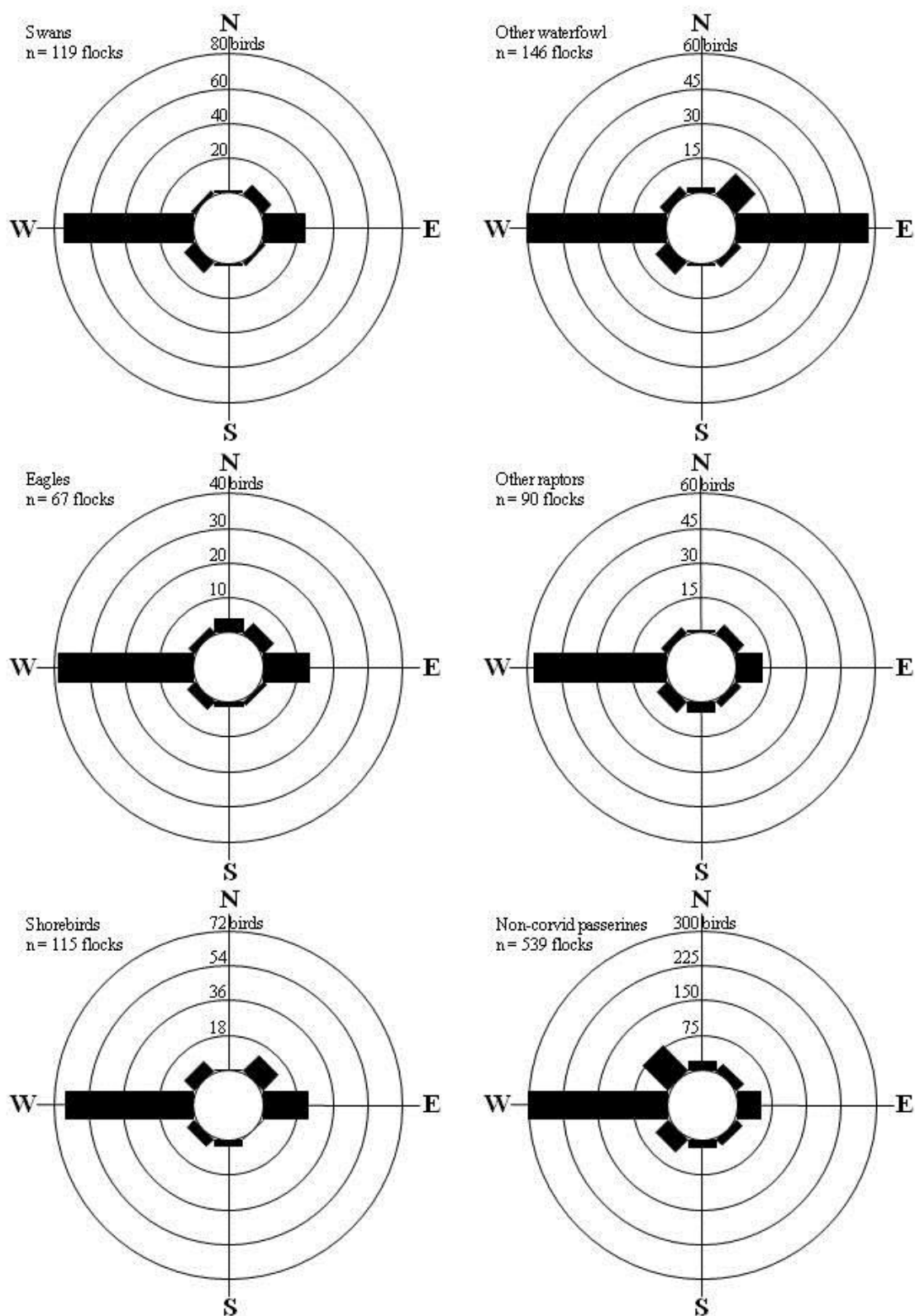
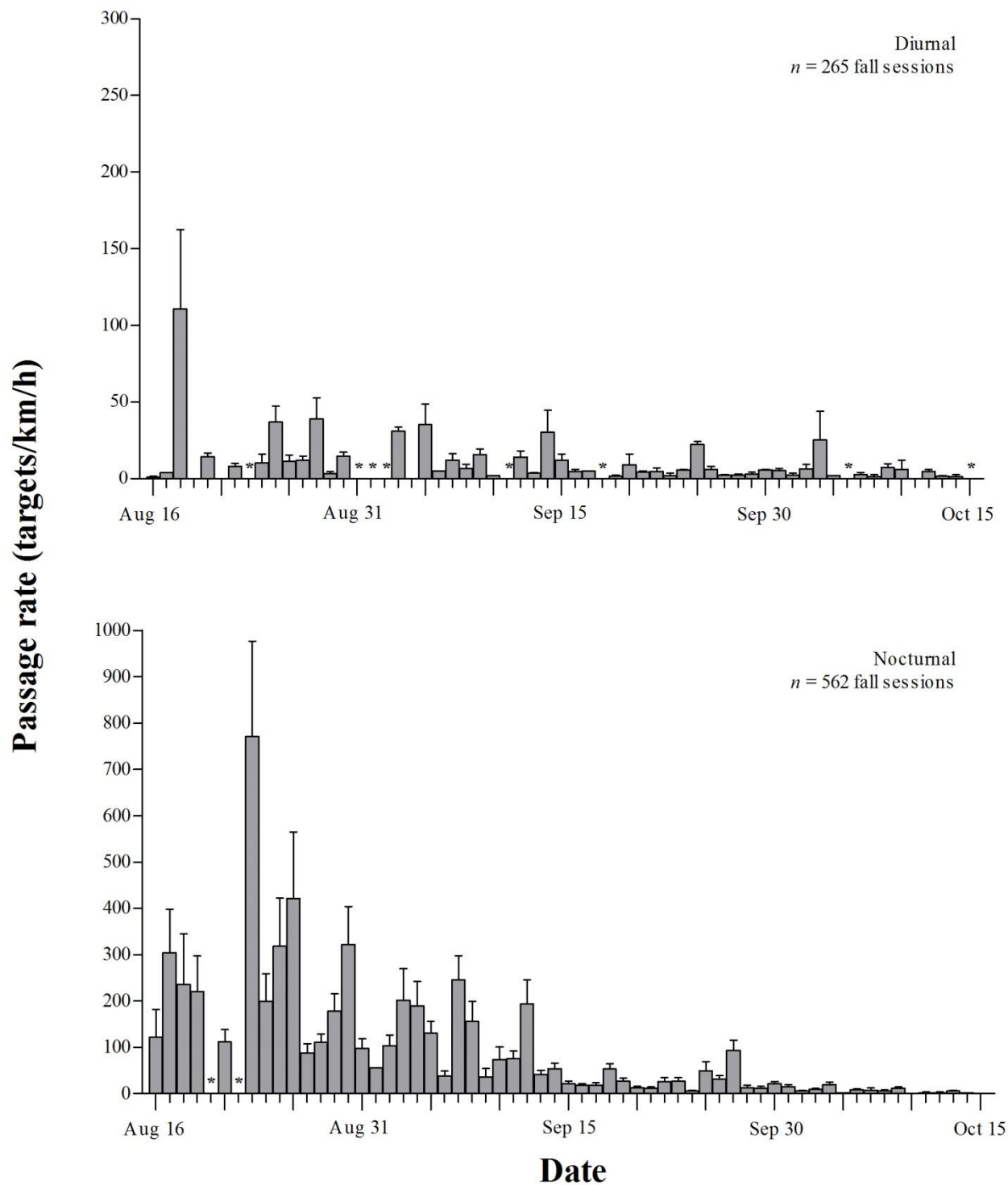


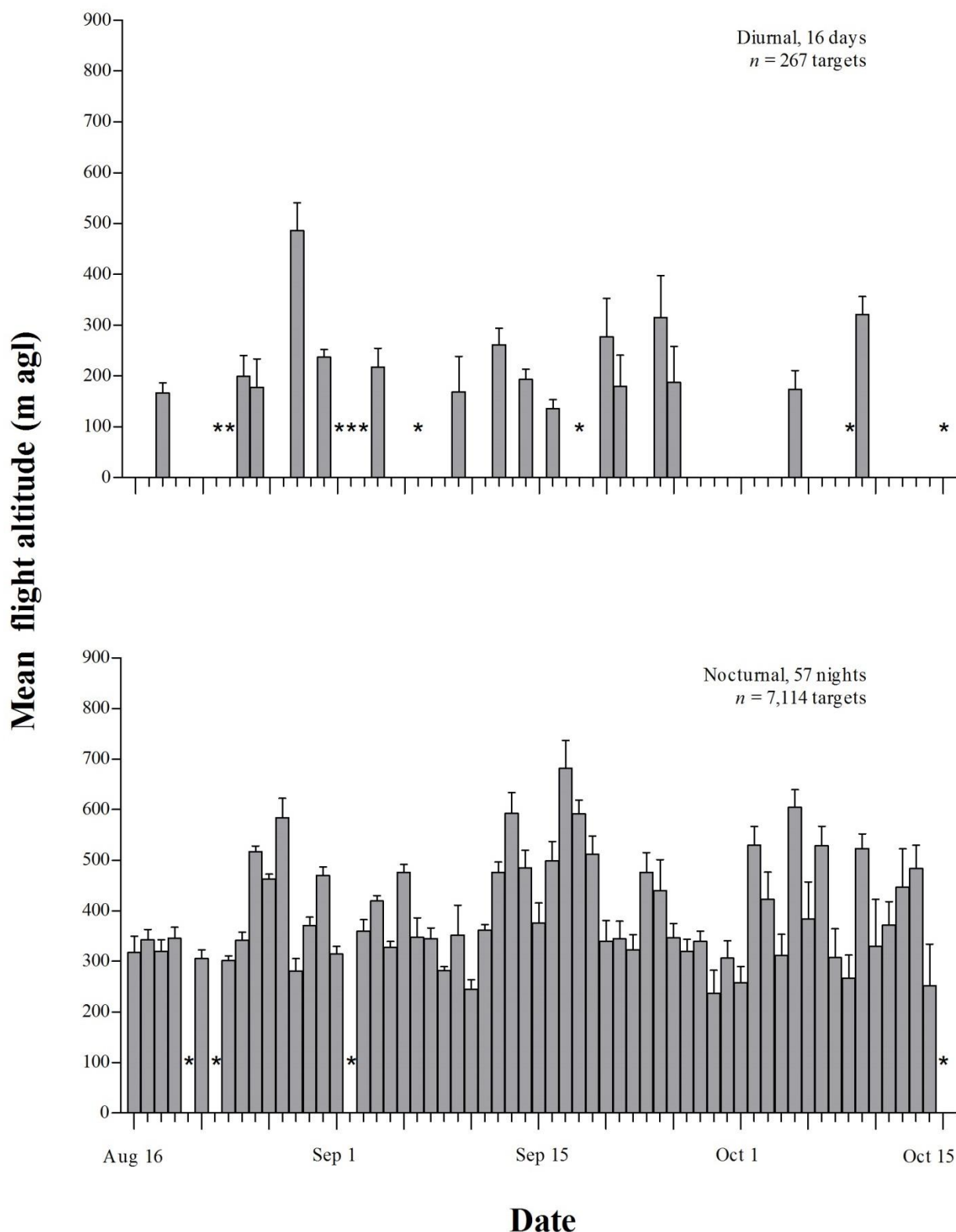
Figure 5.1-18. Ordinal Flight Directions of Bird Flocks Observed during Spring Diurnal Visual Surveys.





**Figure 5.1-19. Fall Diurnal and Nocturnal Passage Rates (targets/km/h) by Date for Targets Detected within the 1.5-km Radar Range. Asterisks indicate that no radar sampling occurred due to weather.**





**Figure 5.1-20. Mean Diurnal and Nocturnal Flight Altitudes (m agl) of Targets during Spring Migration, by Date for Targets Detected within the 1.5-km Radar Range. Asterisks (\*) indicate that no radar sampling occurred (due to weather), and blanks indicate dates with sample sizes too small (<5 targets) to calculate meaningful values.**



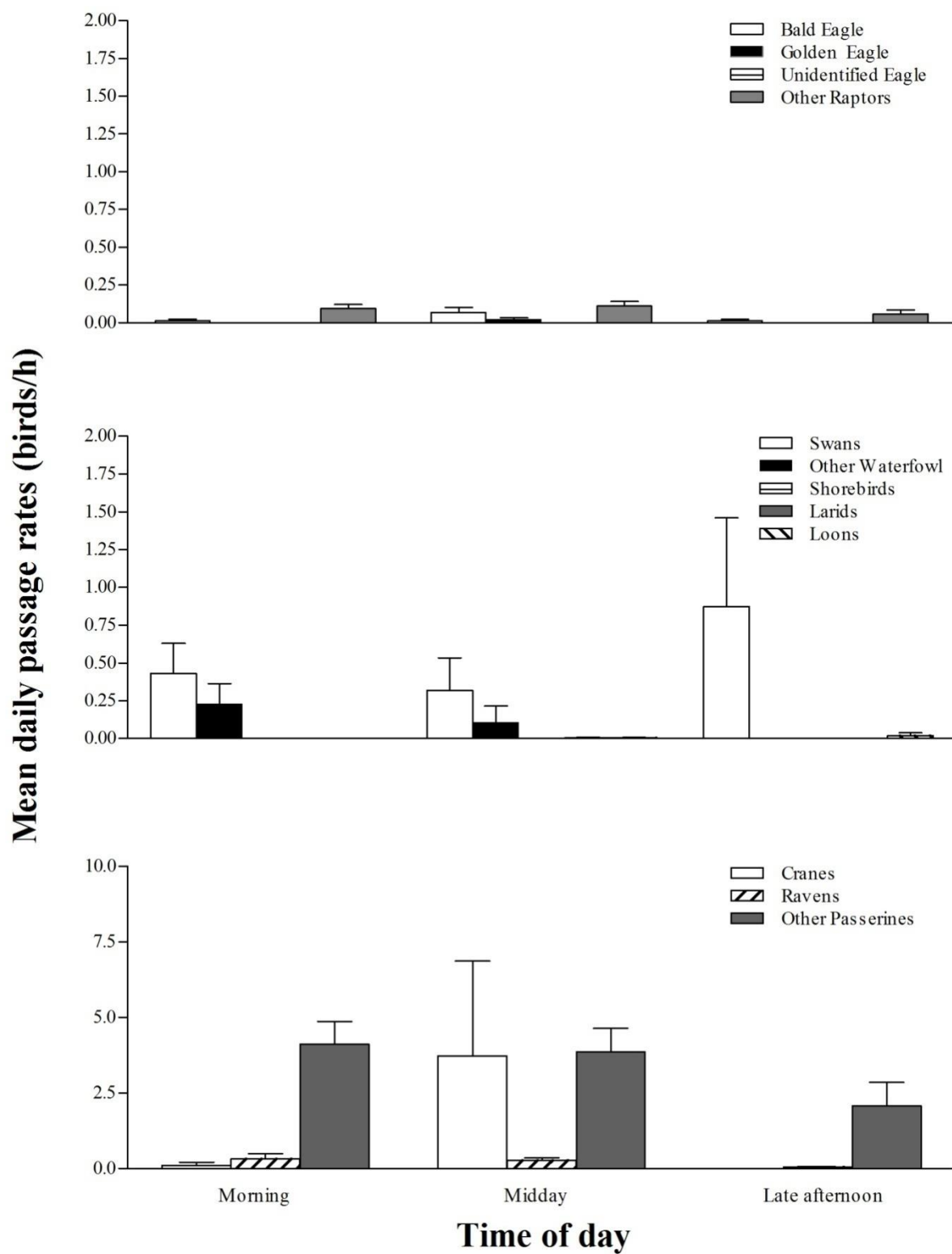


Figure 5.1-21. Mean Movement Rates (birds/h) of Bird Groups by Time of Day during Fall Migration Survey Season.



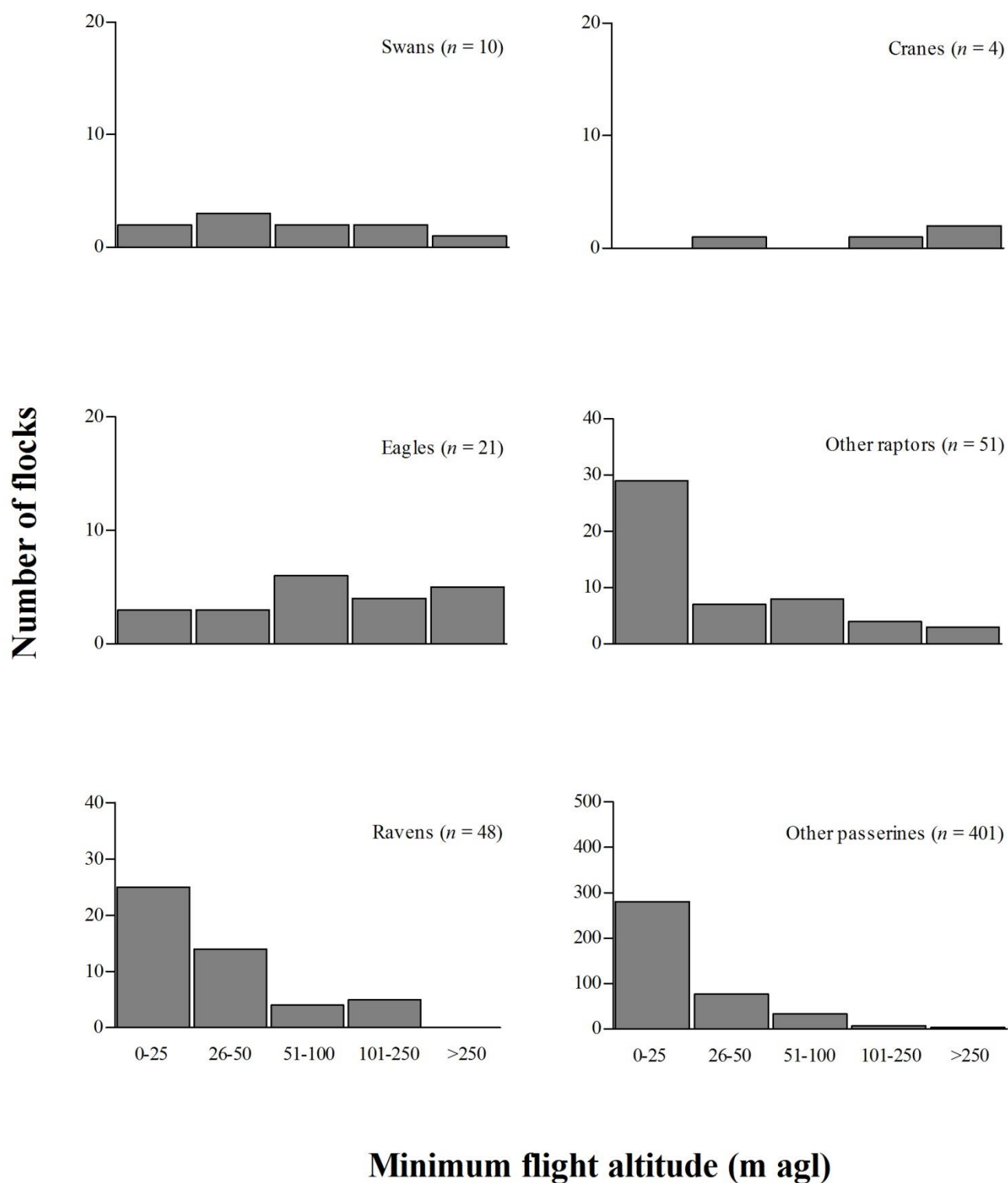


Figure 5.1-22. Flight Altitude Categories for Species Groups Observed during Diurnal Visual Surveys in Fall.



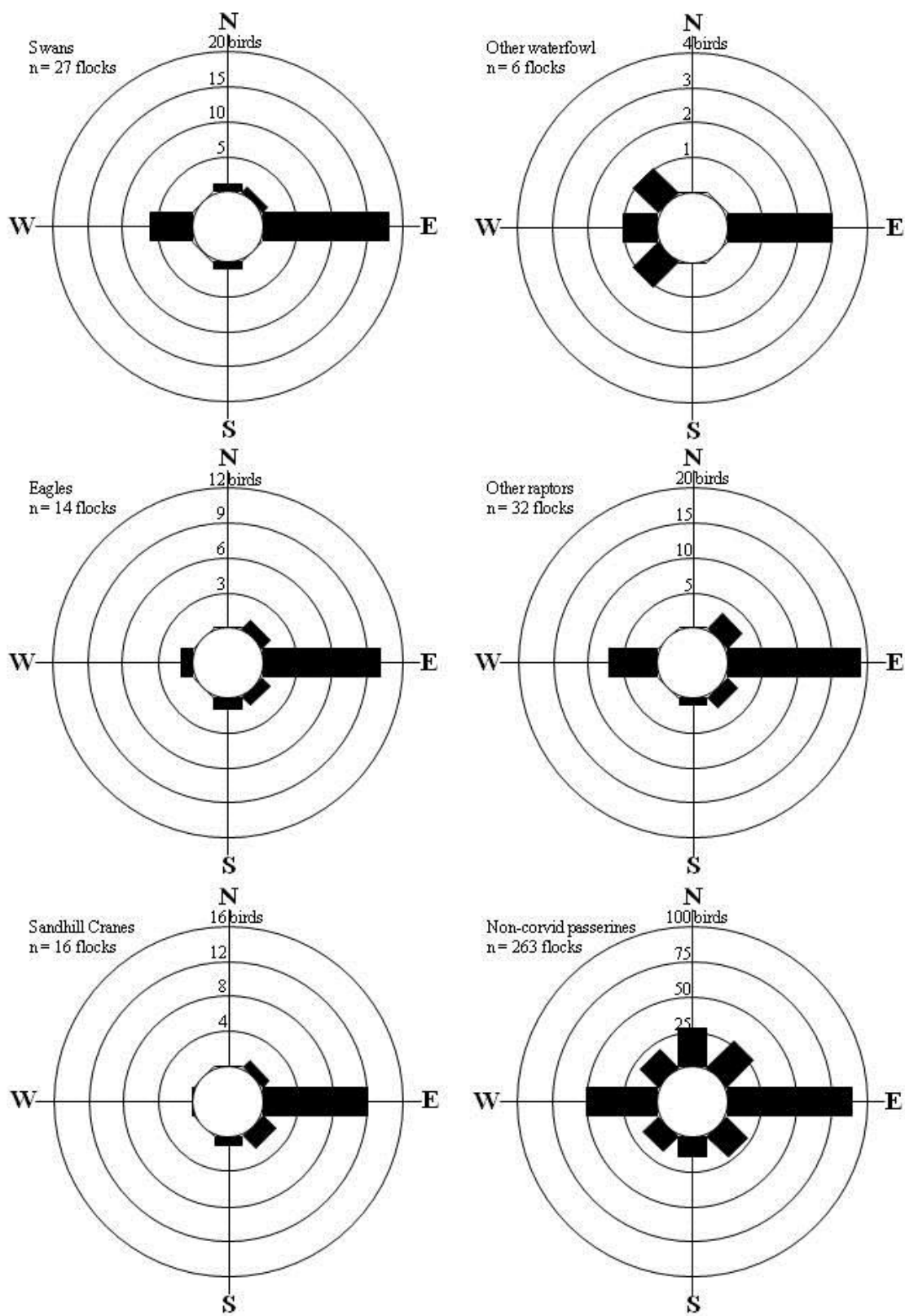


Figure 5.1-23. Ordinal Flight Directions of Bird Flocks Observed during Fall Diurnal Visual Surveys.



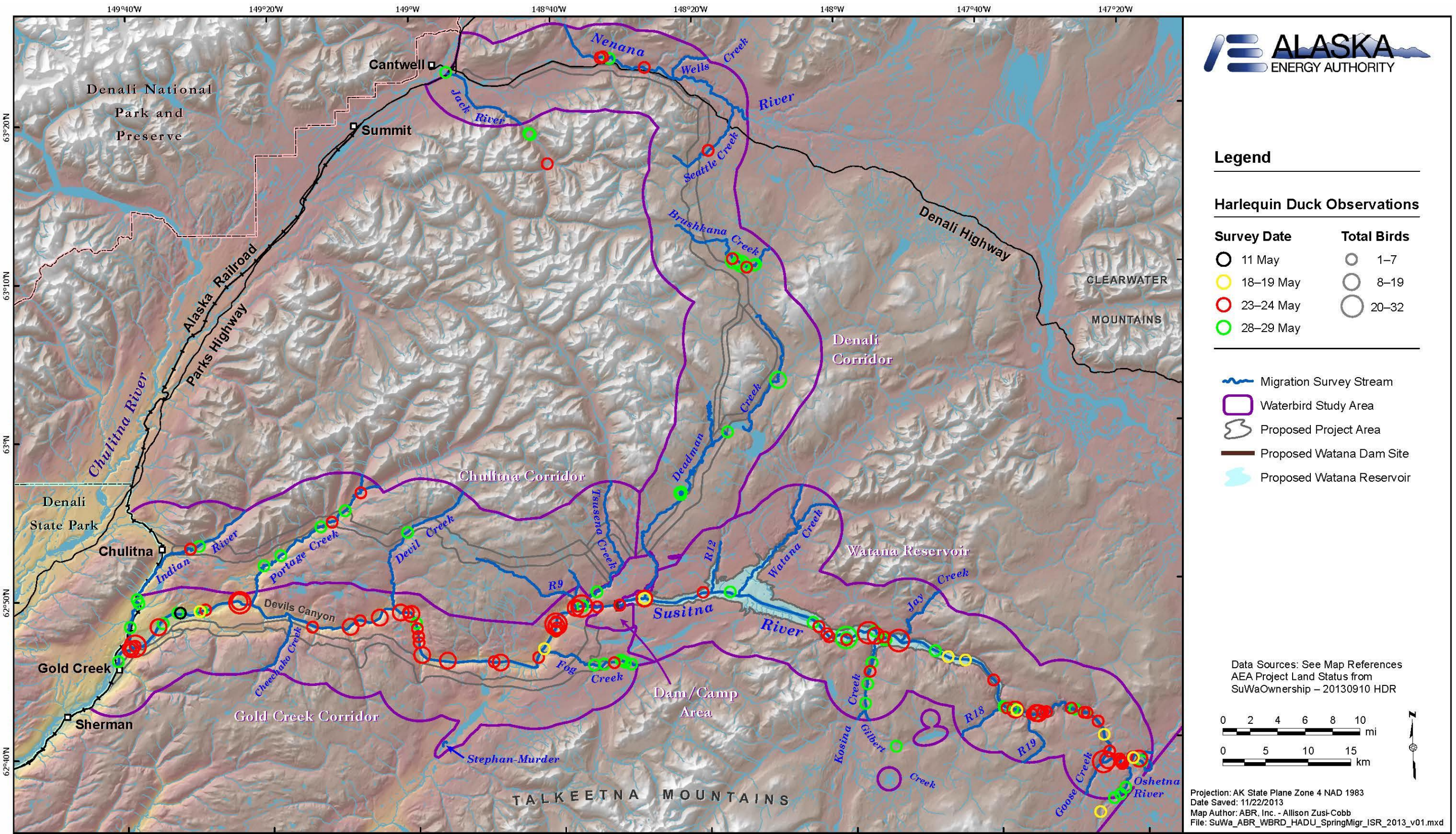


Figure 5.2-1. Locations of Harlequin Ducks Observed during Spring Migration Surveys, 2013.



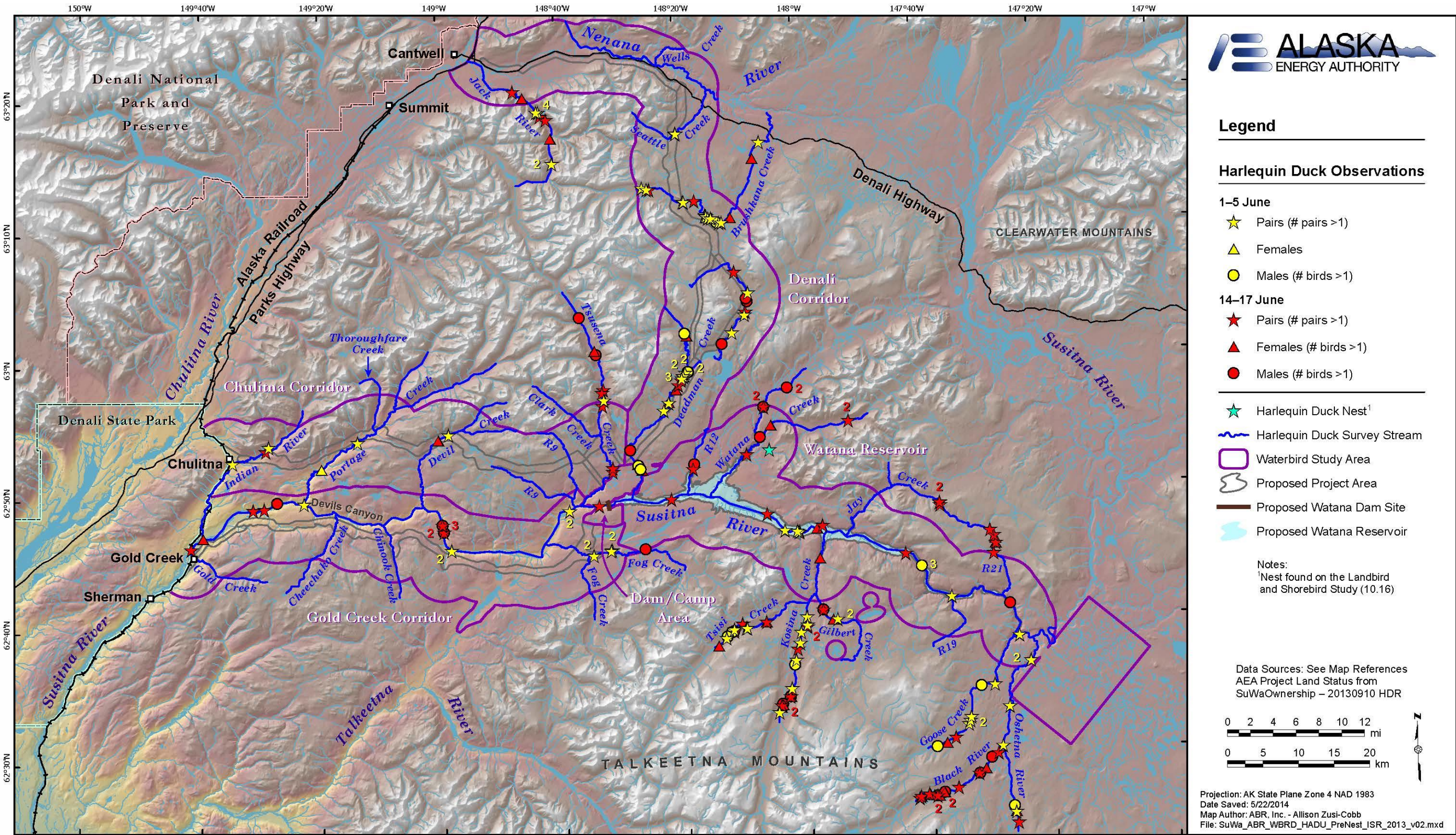


Figure 5.2-2. Locations of Harlequin Duck Observed during Pre-nesting Surveys, 2013.



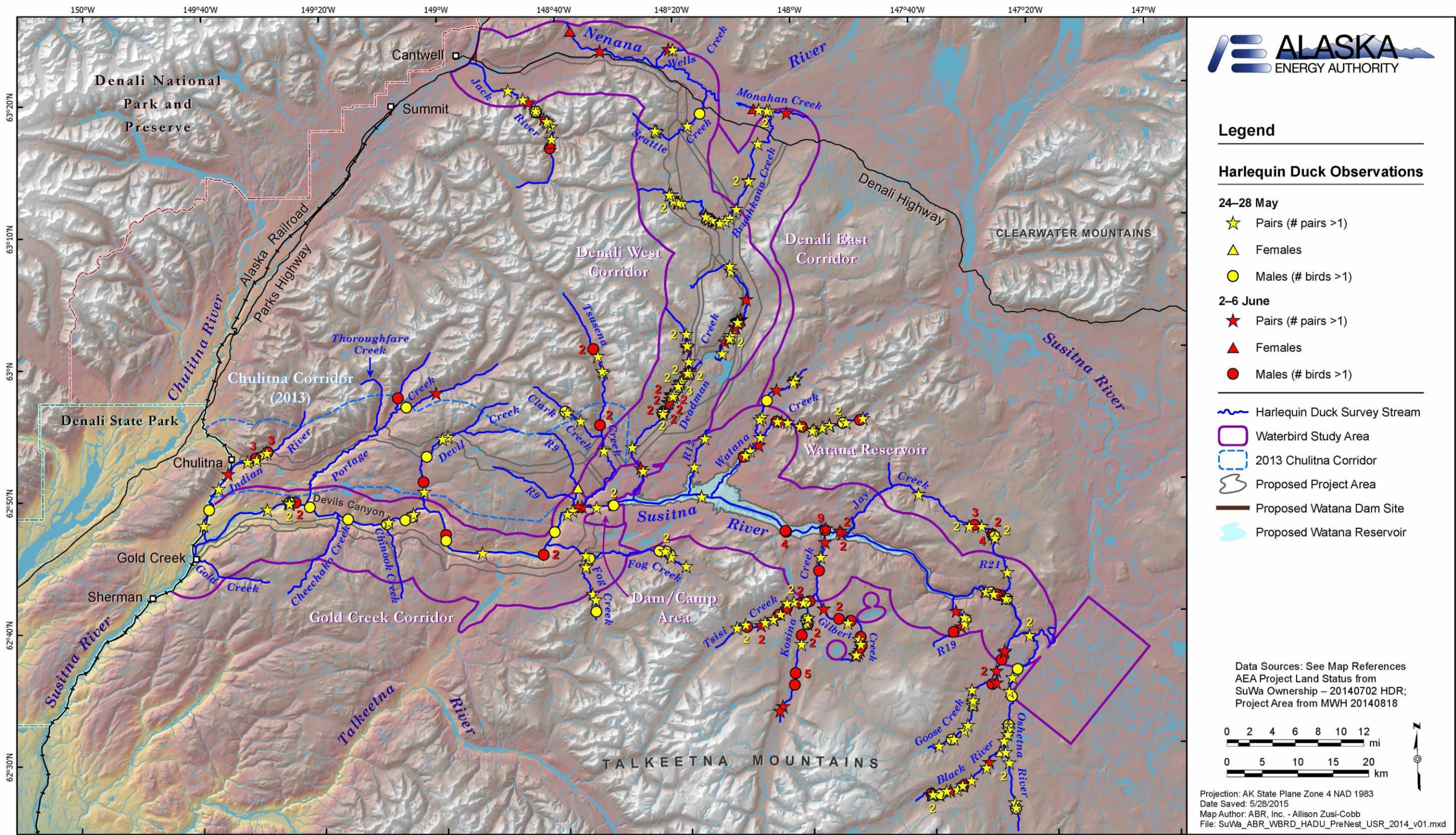


Figure 5.2-3. Locations of Harlequin Duck Observed during Pre-nesting Surveys, 2014.



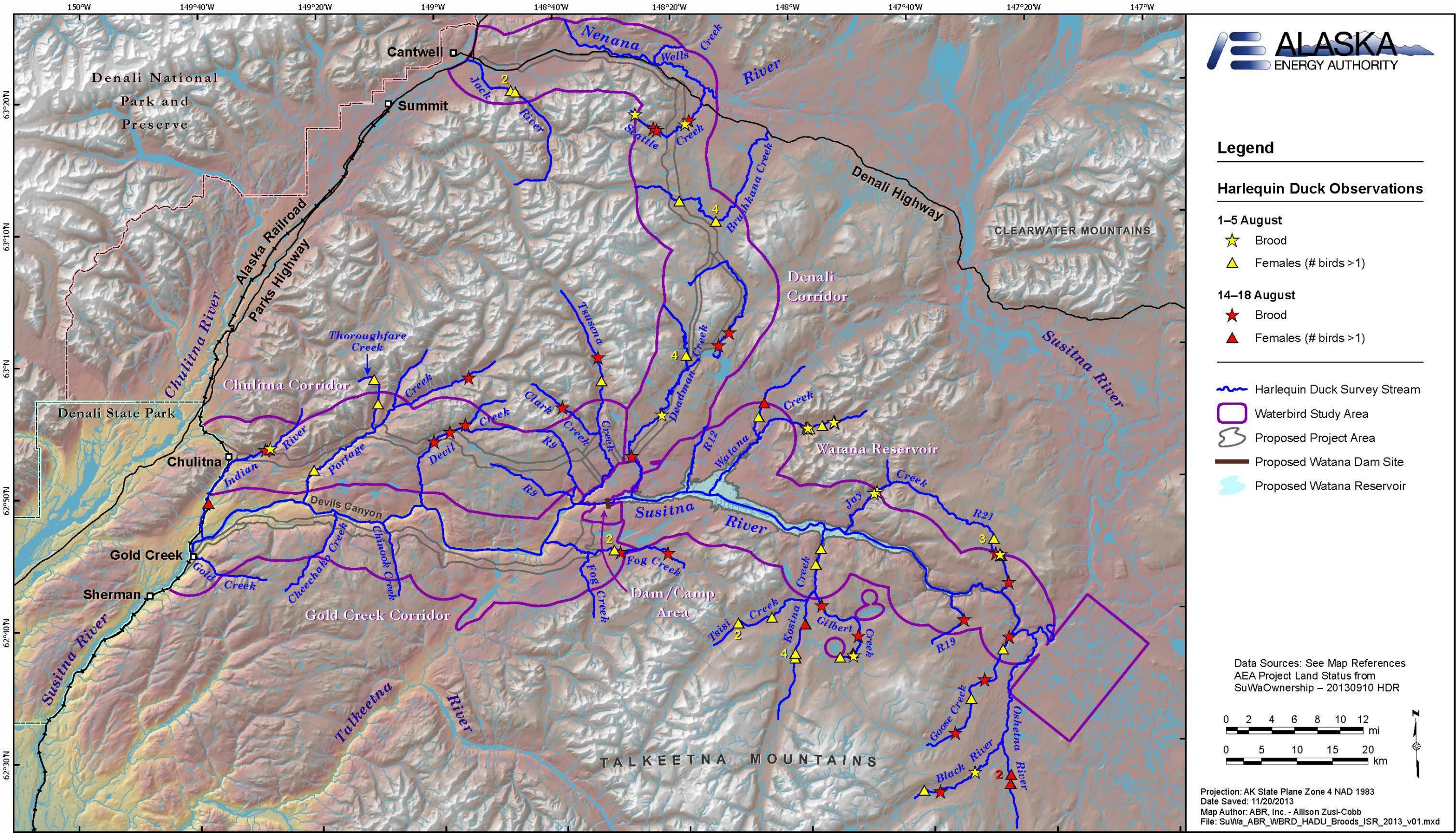


Figure 5.2-4. Locations of Harlequin Duck Observed during Brood-rearing Surveys, 2013.



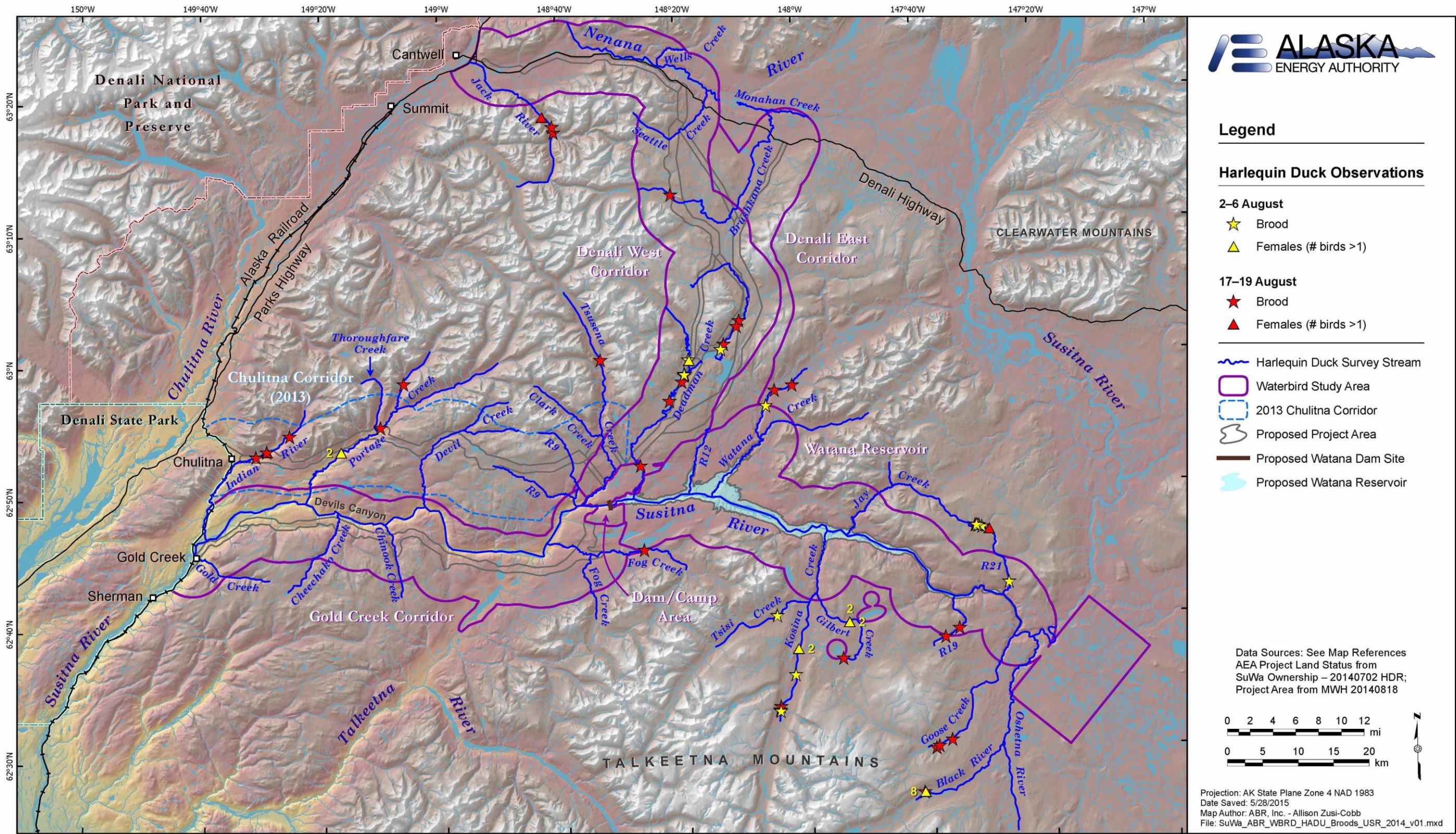


Figure 5.2-5. Locations of Harlequin Ducks Observed during Brood-rearing Surveys, 2014.



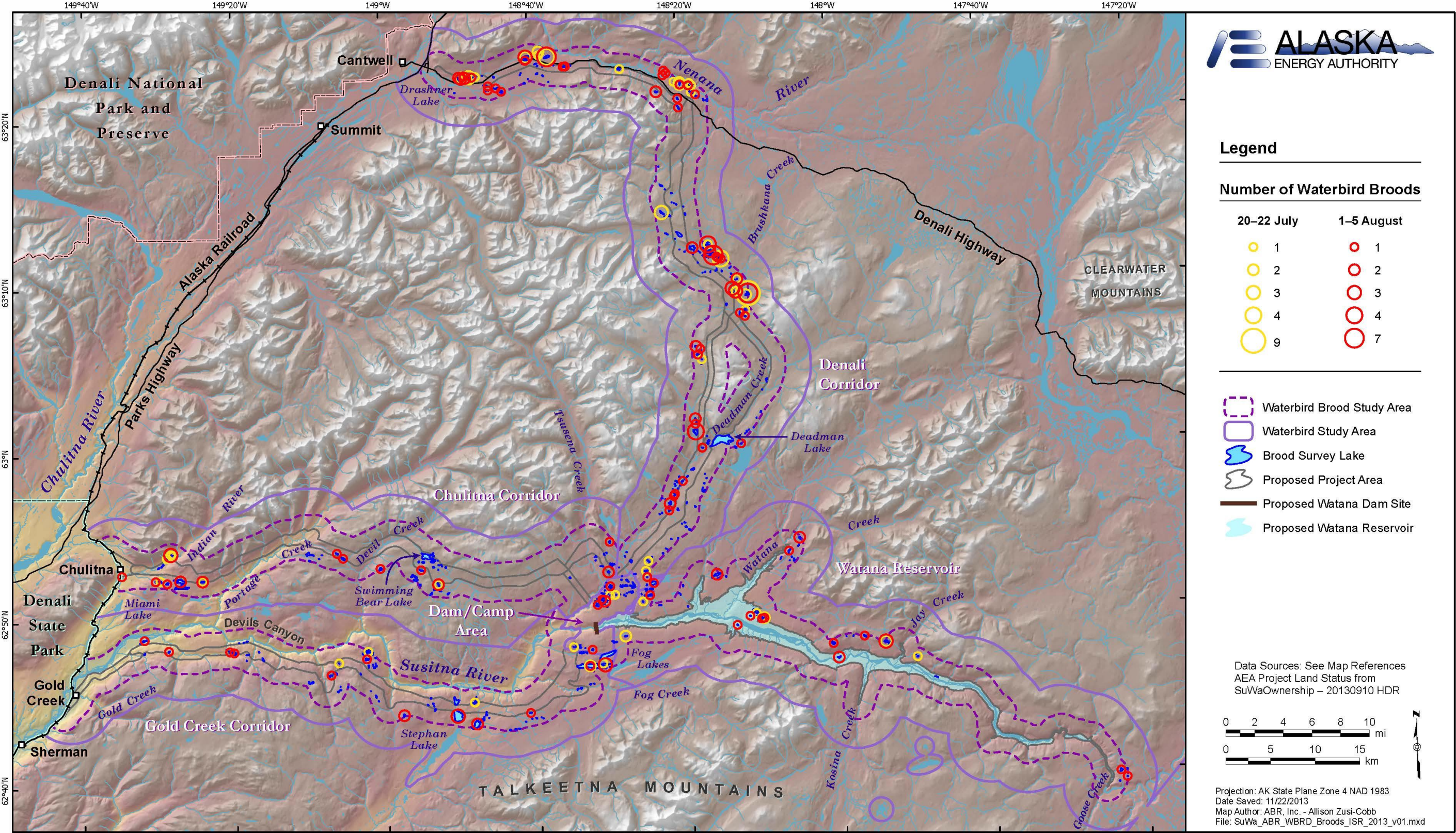


Figure 5.2-6. Locations and Numbers of Waterbird Broods Observed during Brood-rearing Surveys, 2013.



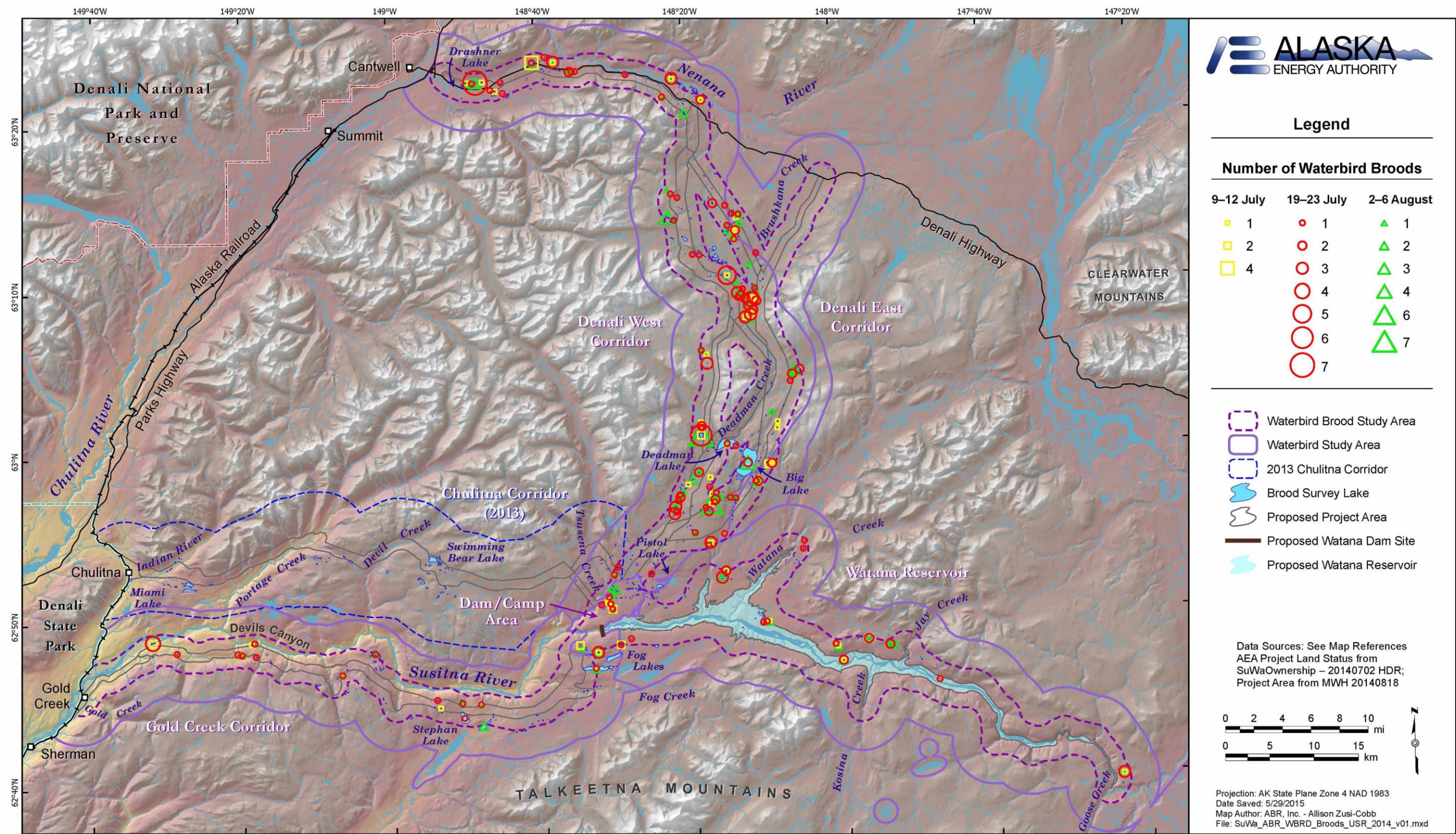
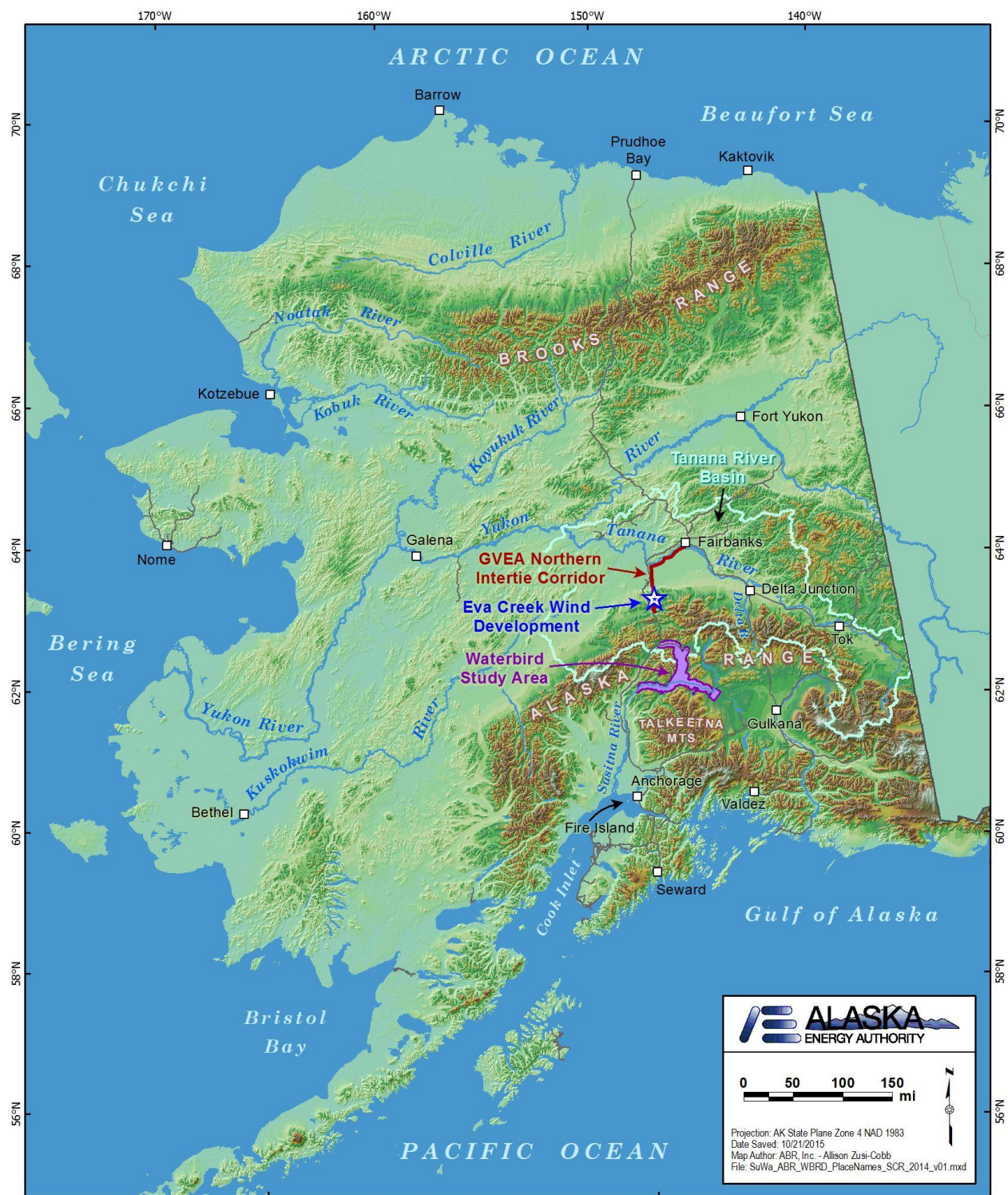


Figure 5.2-7. Locations and Numbers of Waterbird Broods Observed during Brood-rearing Surveys, 2014.





**Figure 6.1-1. Overview map of Alaska with Project site and locations of other migration studies referred to in the discussion.**