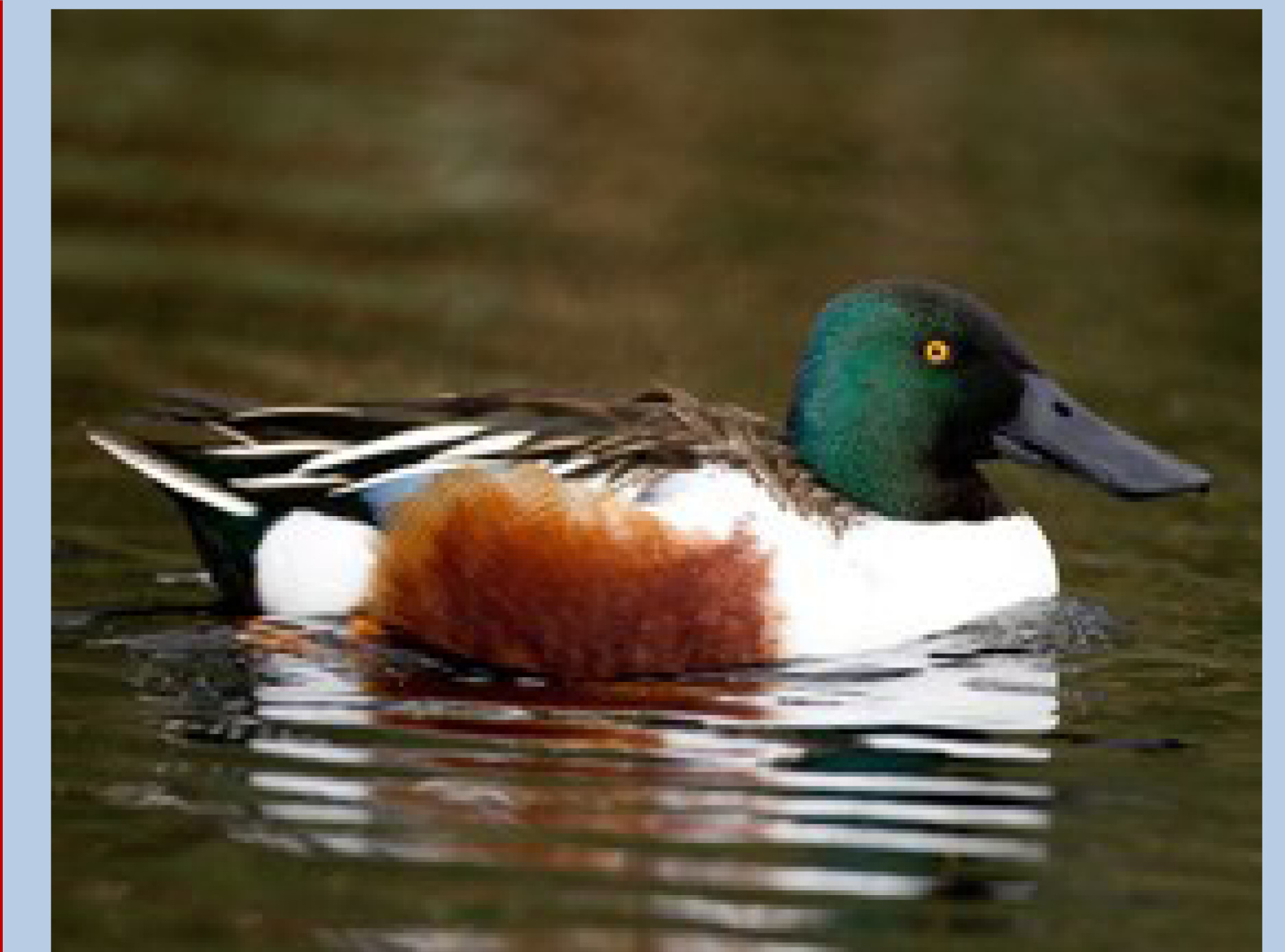


# Wintering Waterfowl Avoidance and Tolerance of Recreational Trail Use

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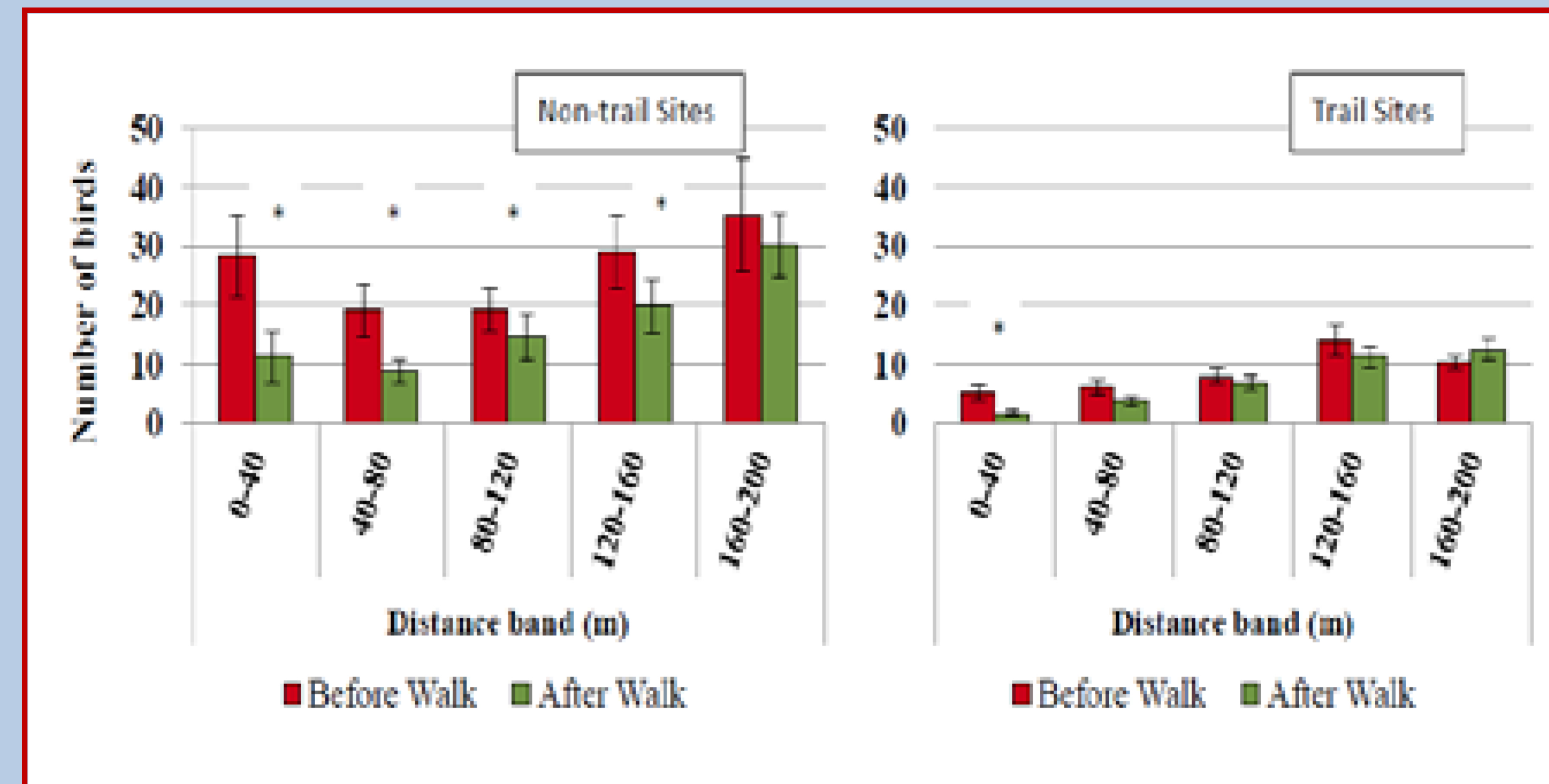
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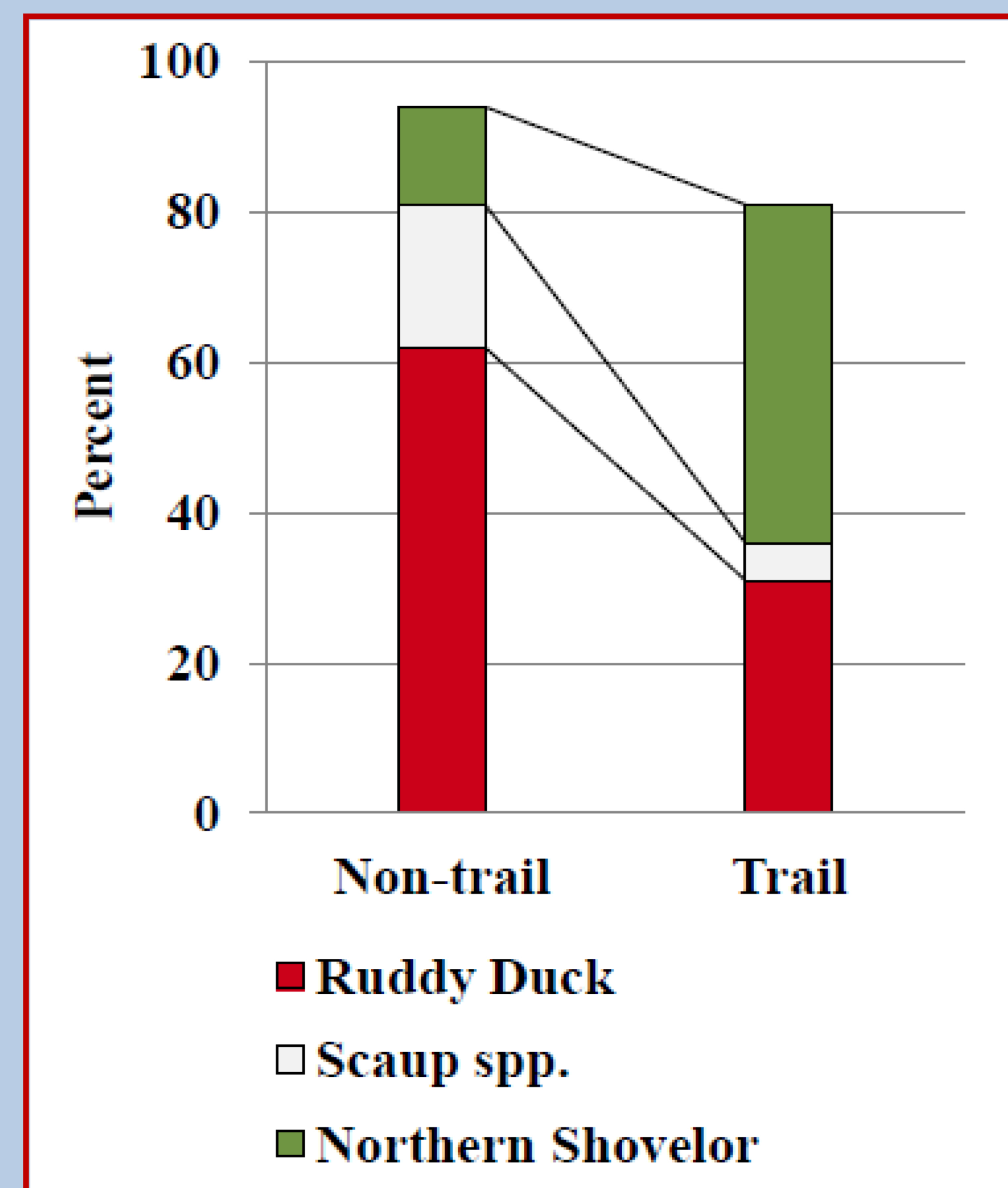
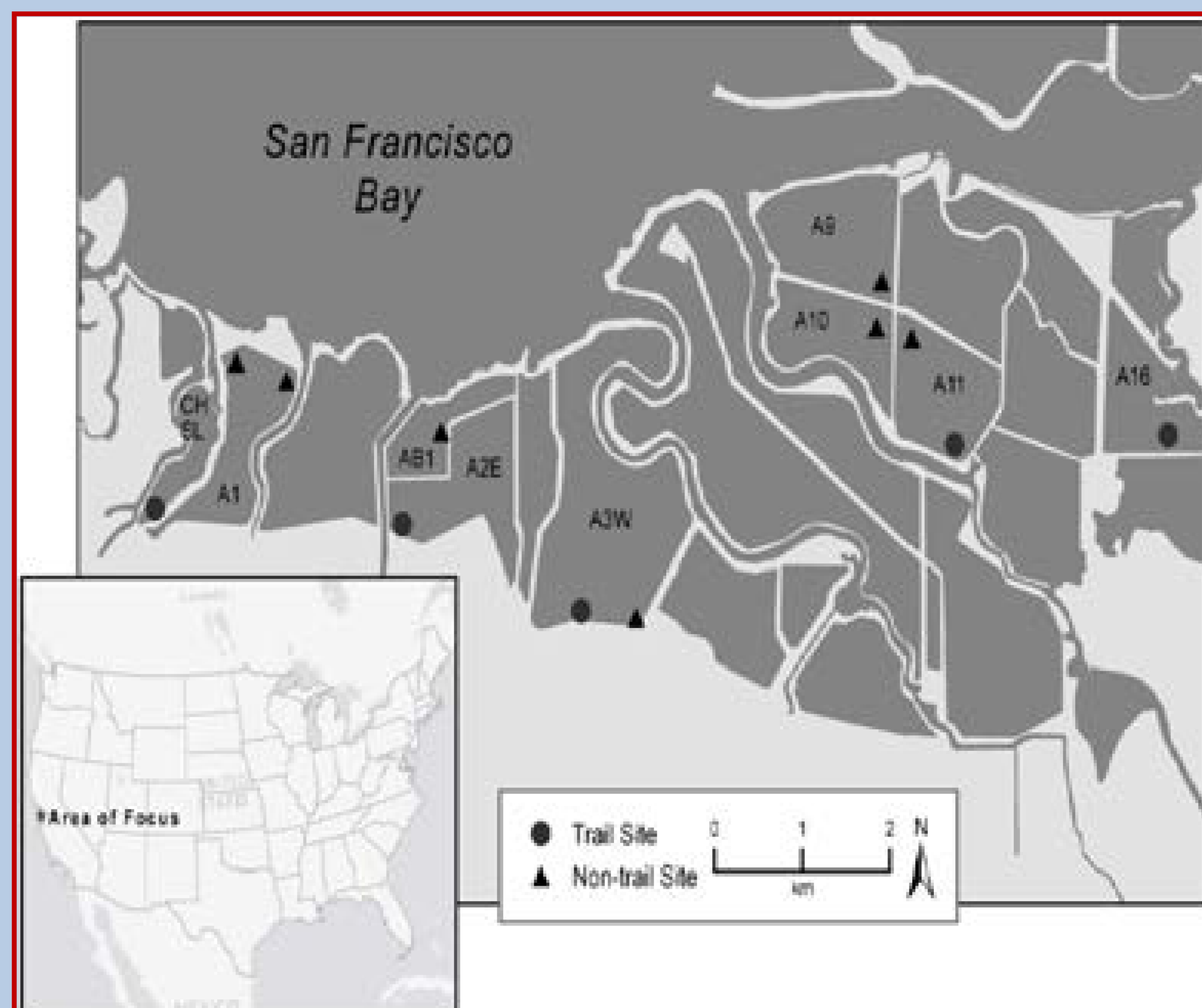
**Goal** We studied the extent to which foraging wintering waterfowl avoided or tolerated introduced trail use in the Alviso Slough complex of the South Bay Salt Pond Restoration Project. Our goal was to provide managers with information for protecting waterfowl while providing public access.

**Methods** Two researchers walked levees at five sites with existing trails and levees at seven sites without trails, all adjacent to pond habitat (see Map below). We compared the number of waterfowl by species before to after our walks in 40 m bands starting at the levee and extending 200 m into the ponds. We also recorded distances to the nearest individuals, responses of focal animals, and numbers of trail users.



## Results

- Decreases in numbers of birds after vs. before walks extended further into ponds at non-trail sites than trail sites (see Figure above; \* = significant at  $\alpha = 0.05$ ). Species and individual responses seemed to drive these differences.
- Waterfowl vs. trail user numbers over the winter season ( $r^2 = 0.315$ ,  $P = 0.102$ ) and number of birds in response to increasing trail user numbers ( $r^2 = 0.041$ ,  $P = 0.847$ ) did not show increasing tolerance to trail use for waterfowl overall.
- Species varied in their tolerances. Ruddy Ducks (*Oxyura jamaicensis*) avoided trail sites, while Northern Shovelers (*Anas clypeata*) were more abundant at trail than at non-trail sites (See Figure to left).
- Focal bird study suggested that “shy birds” may have avoided trail sites, leaving only the “bold birds”.
- Individual birds stayed approximately 170-200 m from researchers during walks at both non-trail and trail sites.



## Conclusions and Recommendations

- Trail use at new and existing sites reduced bird numbers adjacent to trails, changed bird behavior, and reduced the habitat area available to waterfowl compared to conditions before walks.
- Managers should put trails approximately 200 m from wintering waterfowl foraging habitat, concentrate trails in focused areas, eliminate low-use trails, and plan for significant amounts of trail-free areas.