Prairie Falcon Predation Continues on Dwindling Prey Populations

Andrew Baker, Zoe Bonerbo, Eden Ravecca, Kevin Myers, Kevin Warner,
Zoe Duran, Megan Yrazabal, Charles Baun, Jen Cruz

Introduction

- Prairie Falcons (*Falco mexicanus*) are large (420-1100 grams) pale-brown falcons that inhabit the sagebrush ecosystems of western North America (1).
- Prairie Falcons depend on Piute ground squirrels (*Urocitellus mollis*) as a staple food source during the breeding season (2).
- Piute ground squirrels are also important prey to other predators in sagebrush ecosystems including badgers and Golden Eagles.
- Piute ground squirrel populations have experienced major declines in abundance from various factors in recent years (Fig. 1).

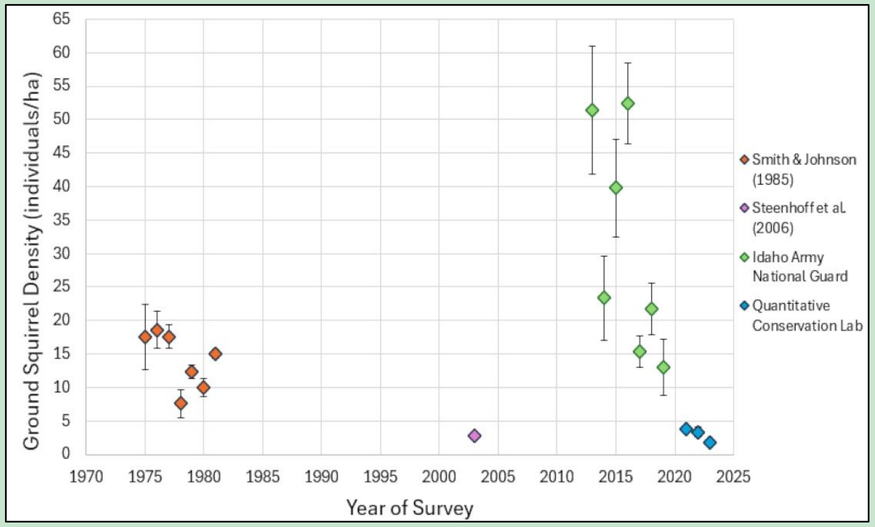

Figure 1: Annual number of unique individual Piute ground squirrels trapped, which were reported as raw densities per hectare averaged among sites surveyed each year, regardless of habitat type. Surveys during 1975-1983 used 5 sites, 2003 used 12 sites, 2013-2019 used 8 sites, and 2021-2023 used 4-5 sites. (3,4)

Methods

- The survey area was the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA) in southwest Idaho. Raptors, including Prairie Falcons, nest on the cliffs along the Snake River (Fig. 4).
- We placed motion-activated cameras facing 4 Prairie Falcon nests in the NCA (Fig. 5).
- We processed photos (n=68,883) by recording the species of prey delivered to nestlings, time of day, and number of nestlings observed each day.
- Prey deliveries were grouped into 5 categories and tallied as a percentage of total prey deliveries observed for each nest (Fig. 2) and compared to prior figures on prey deliveries from 1992-1994 (Fig. 3), which surveyed nests manually through binoculars (5).

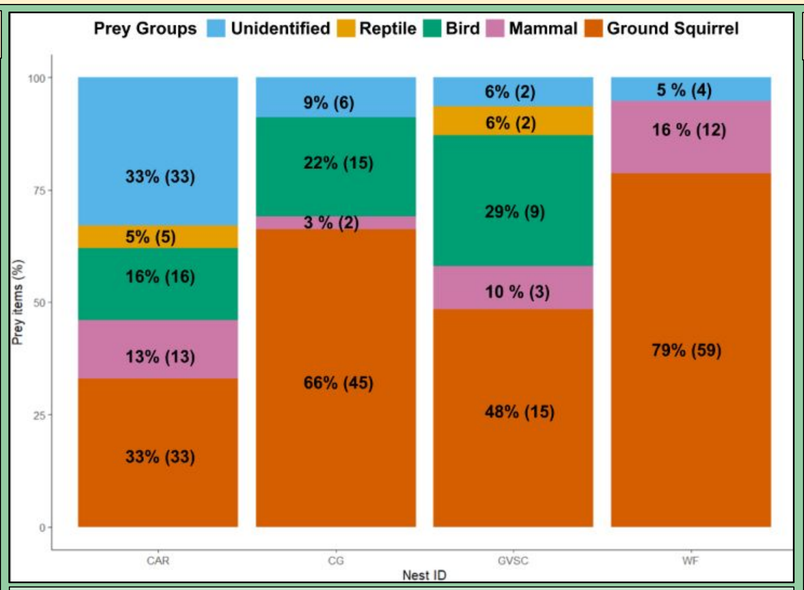

Figure 2: Prey delivery percentages classified into 5 prey groups for four Prairie Falcon nests monitored during the 2023 breeding season. Percentage of diet composition is displayed along with counts of prey deliveries for each prey group.

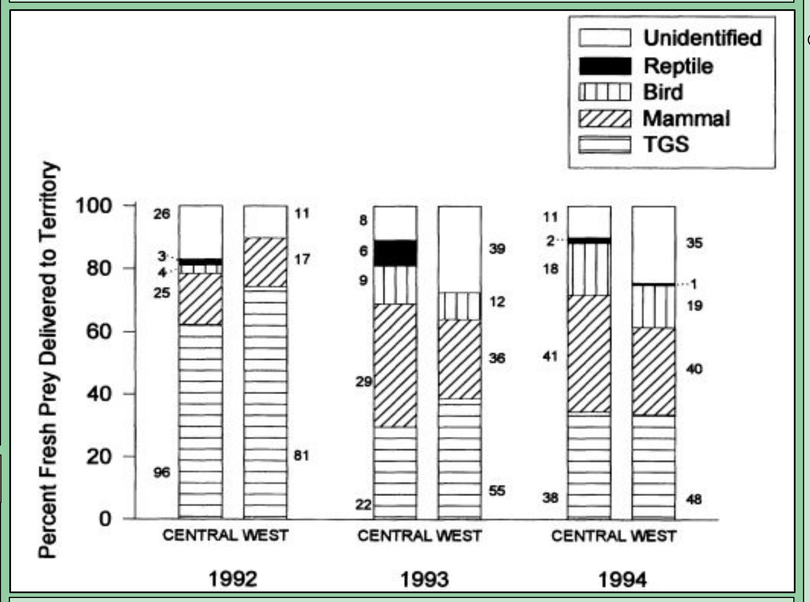

Figure 3: Historical prey deliveries by Prairie Falcon monitored using binoculars from afar during the breeding seasons of 1992-1994 in SW Idaho (5). "TGS" refers to Townsend's ground squirrel; later reclassified to Piute ground squirrel.

Figure 4: Photo of the Snake River showing canyon faces that support raptor nesting sites. Photographed in the southeast NCA near Mountain Home, Idaho (credit Andrew Baker).

Results and Discussion

Figure 5: Two nest camera photos of adult Prairie Falcons and nestlings. The left photo shows a prey delivery (ground squirrel), and the right shows immediately after prey delivery.

- A total of 274 prey deliveries were recorded across all nests in 2023. Cameras captured photos for varying time spans (3-21 days) (Fig. 2).
- Ground squirrels were the most common prey (33 to 79% of deliveries) in our 2023 study (Fig. 2); likewise in 1992-1994 studies (35-75%) (Fig. 3).
- Prairie Falcons appear to be continuing to favor ground squirrels as main food source during breeding season, despite low abundance in recent years (Fig. 1).
- Such strong reliance on ground squirrels by Prairie Falcons suggests that ongoing declines of ground squirrel populations are likely to impact Prairie Falcon demography soon, unless Prairie Falcons can adapt to other food sources during the breeding season (Fig. 6).

Figure 6: A nest camera photo taken of two Prairie Falcons: one delivering a Piute ground squirrel to nestlings, another with a captured Ord's kangaroo rat *(Dipodomys ordii*) that was later shared with the other adult Prairie Falcon; evident in subsequent photos.

Acknowledgements

We thank the Idaho Army National Guard for field equipment and support with trapping ground squirrels and fitting nest cameras. We thank Julie Heath and her lab for helping with placing nest cameras. Figure 3 was extracted from Marzluff et al. 1997. We also thank Boise State University for funding and members of the QCL that helped with field work.

References

(1) Steenhoff, K. (2020). A. F. Poole, Birds of the World, **(2)** Steenhoff et al. 1988, Journal of Animal Ecology, 57, 37-48, **(3)** Smith et al. 1985, Ecology, 66(1), 171-178, **(4)** Steenhoff et al. 2006, Western North American Naturalist, 66(4), 482-491, **(5)** Marzluff et al. 1997, The Condor, 99(3), 567-584