Northern Harrier Foraging Modes in Habitats Around Humboldt Bay

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Introduction:

POI:

Humboldt Bay provides high quality wetland and grassland habitats in proximity. Predators such as Northern harriers must select habitats to situate themselves and utilize specific foraging modes to maximize their energy intake (Collopy and Bildstein 1987). In the past, I have observed harriers tending towards different foraging modes in different areas, and I wanted to see if there was any connection with the habitats they are using.

Objective/ Aims:

There is a notable lack of research regarding their foraging behaviors in wetlands of the Western US. This research intends to fill those gaps, as well as broaden our understanding of the species and how it uses the landscape.

Materials and Methods:

- Focal sampling for a duration of 20 minutes
- Data collected binoculars and a spotting scope when necessary
- Data collection in the three hours preceding sunset
- Time activity budget (foraging, perch, other)
- Foraging modes, attempts and successes
- Chi square test of good fit for testing hypothesis
- Logistic regression to predict northern harrier presence/ absence

Study Area:

Humboldt Bay is a 62.4 km^2 estuary and is the second largest coastal estuary in the state of California (Barnhart et al. 1992). I had ten sites which I collected data from, five of which were grassland and 5 wetland.

Discussion:

There are several potential explanations for me not observing foraging attempts in grasslands. (1) Northern harriers have a minimum area requirement of 55 ha in grasslands (Walk and Warner 1999). (2) Female harriers defend territories on grasslands, and when they do, they only hunt 6-16% of daylight hours (Temeles 2022).

My hypothesis that Northern harriers would rely on BC and SLP as their foraging modes in wetlands was partially correct. The chi square test found them to significantly rely on BC and HKP. My hypothesis that they would rely on BC was correct, but I misclassified the other foraging modes. Perhaps they rely on HKP more due to higher winds found in wetland plots due to marine influence.

Though I observed zero successful foraging attempts during my field data collection, there was one occasion where my first sighting of a harrier was shortly after a successful foraging attempt. These observations reiterate the results of other studies, where harriers will have low foraging attempt successes (Temeles 2022).

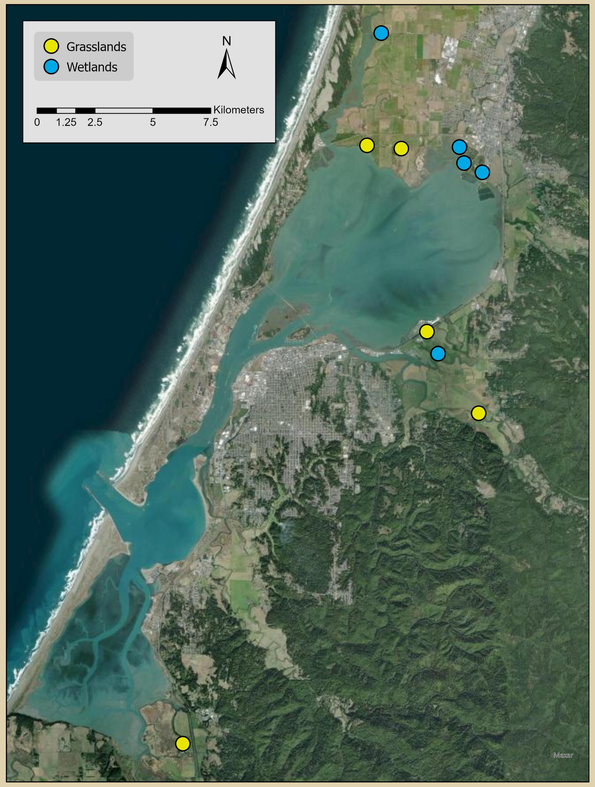

Figure 1: Map showing locations of all field data collection sites.

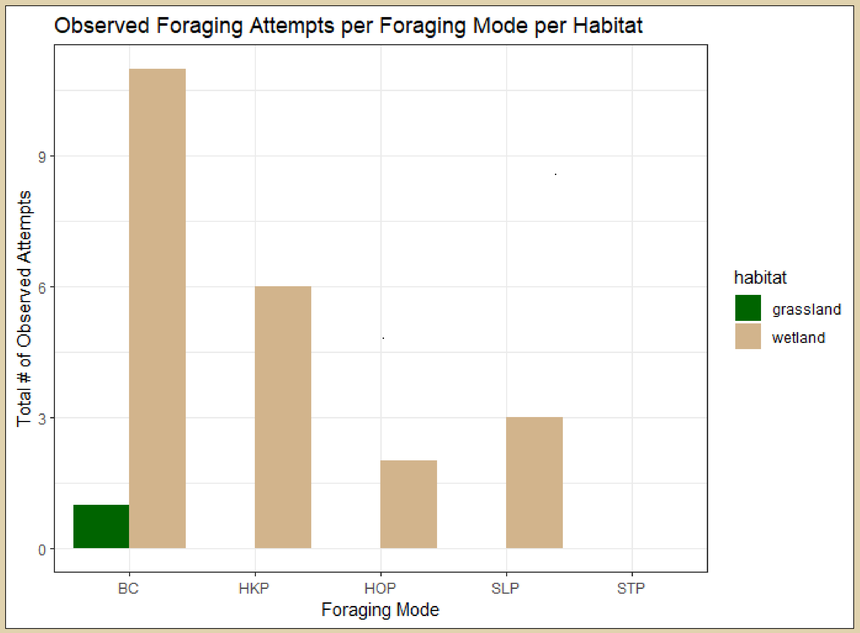

Figure 2: Table showing the number of attempts for each foraging mode. Foraging modes are classified according to what habitat I hypothesized they would be used in.

Hypothesis:

Harriers in wetlands will primarily use bird chases [BC] and slow pounces [SLP] to forage and that birds in grasslands will use hover pounces [HOP], hook pounces [HKP] and straight pounces [STP].

Results:

During my field data collection, I was only able to observe one foraging attempt over my grassland sites. My logistic regression suggested that harriers forage significantly more regularly over wetlands than grasslands (pval=0.046).

My hypothesis regarding wetland foraging types was only partially correct. I predicted harriers would use BC and SLP in wetlands. My chi square test showed that harriers significantly used BC and HKP in wetlands (pval=0.03).

I observed zero successful foraging attempts during my field data collection.

Acknowledgements:

- Wiyot land
- David Sinn
- Rob Blenk
- Dan Barton
- Yoon G. Kim
- Ho Yi Wan
- Frank Fogarty
- Charles Bartolotta with CDFW
- Jason Storlie with USFWS

Citations:

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