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Whidbey Island River Otter Research Summary

Coast river otters, like the ones that inhabit Whidbey Island forage in both marine and fresh water environments. If we think of each feeding location as a foraging patch, then otters go from one patch to another as the resources dwindle or change, or as human activity increases. Humans too, are foragers, our grocery shopping behavior is similar to that of the otters: If there are too many competitive pressures (e.g., available parking spaces), the resources are less desirable (e.g., few preferred brands), or the costs for those products (e.g., the price) are too great, we move on. Comparative animal behavior researchers are more interested in theses similarities than the differences between species. In fact, much of what we know of human sensation, cognition, and emotion comes from studies of non-human animals.

Why River Otters? Otters are an important species for comparative psychology because like people, their diet is elastic, depending on the context. Also, they are an indicator species; that is, subtle environment changes such as season, tides, current, salinity, and time of day can affect their foraging patches, food sources, when and where they breed, and reproductive season. Thus, alterations not only influence food choice throughout the day but also contribute to "giving up time" within a patch, a region, a kin-group, and a mate. River otters are a great comparative model because they are so flexible: They don't migrate, they have large territorial ranges (up to 100 km), their breeding season varies by region, their diet adjusts as resources become less plentiful, their daily activity shifts, their seasonal activity changes, they occupy freshwater, saltwater, estuaries, bays, lakes, rivers, ponds.

Why Whidbey Island? Whidbey Island is 45 highway miles from one end to the other but with 200 miles of shoreline and eight large lakes, providing many river otter habitat options within a relatively accessible, geographic area. The questions this longitudinal project hopes to answer include the following:

1.) Why do otters choose one area over another? In other words, to what extent does season, time of day, current, tides, and human activity influence the frequency of their foraging pattern? Behavioral observations, infrared cameras, citizen scientist reports, latrine and track documentation provide reasonable data to support this question.

2.) How far to do the Whidbey Island river otters travel? What is their range? This question requires genetic fingerprinting from fecal samples collected along the island to see if the same animal in Admiralty Bay is also traveling to Strawberry Point in Oak Harbor.

3.) What is the Whidbey Island river otters' diet? Is it the same across populations along the island? This empirical question relies of scat sampling and collection across the island.

In June of 2019, Washington State Fish and Wildlife released the list of species Washington state Species of Concern (i.e., Endangered, Threatened, or Sensitive), this includes 45 mammals, birds, amphibians, invertebrates, and fish. Of the 37 fish on the list, the Puget Sound is home to 21 (e.g., Chinook salmon, a variety of rockfish, and Pacific cod), so what are the river otters' primary preferred prey? To what extent does that affect the health and ecology of Whidbey Island, the Puget Sound, and the Salish Sea?

4.) Are their human contributing factors that influence their foraging patch giving-up-time? In other words, when do they leave an area to seek out resources elsewhere?

For example, Admirals Lake in Admirals' Cove has an algal season. When the shallow temperatures rise and become hypoxic in late summer, it is not uncommon to see algae blooms, marking an exodus of birds and wildlife across the Admirals lake ecotone to Admiralty Bay. Although the otters continue to use

the lake, they no longer latrine along the bank as they did in the winter and the spring. The use of "latrines" and latrine fidelity is not necessarily to mark territory, rather to mark and identify their presence; though this appears to be independent of breeding and/or pupping seasons. To further complicate things, their marking is not consistent throughout the year.

5.) River otter scat often carry digestive tissues, including a digestive jelly that lines the stomach. The variable elimination of the fecal mucous is another mystery that might provide information about organic persistent pollutants and other contaminants. Why do some fecal samples contain jelly and others do not? Some literature suggests this occurs among
males only, if so why just males?

Comparisons of the concentration of contaminants from different preferred fish against the metabolized concentration found in otter scat provide a metric of contaminant load, this is useful for other indicator and keystone species that also prey on saltwater fish (e.g., endangered resident orca population).

6.) What is the concentration of contaminants in the tissues of river otters? This can be measured both through necropsy of salvaged carcasses (Washington State Fish and Wildlife Salvage permit #: Island 19-282) and modestly through fecal samples, particularly those with digestive jelly. Additionally, stress hormones, parasite load, and zoonotic disease can also be gleaned through fecal and tissue samples.

Why Care about Whidbey Island River Otters? River otters in the state of Washington are currently listed as a "least concern" species, additionally they are a bellwether species, serving as both a biological indicator (i.e., their presence, absence and abundance reflects the health of the ecosystem) and flagship species (i.e., an ambassador animal in reference to the health of local ecology). River otters use the watershed and effluviant to the Sound to feed, travel, and socialize; therefore, exposure to pollution and environmental contaminants (e.g., brominated flame retardants) is considerable and persistent. Through a better understanding of the health and behavior of the diet and habitat-flexible local river otter populations allows us to better gauge the overall ecological health of Whidbey Island.

Citizen Scientists Are Appreciated. This research is heavily dependent upon the support of the local community. Citizen scientists are encouraged to **report sightings**, dens, latrines, carcasses, residential colonization (i.e., nest-building under decks), cooperative and collective foraging, and anything perceived as meaningful river otter behavior. **When reporting an otter sighting,** especially helpful data include: Date of sighting, time of day, location of sighting (GPS coordinates are appreciated), number of animals, length of observation, and behavior. **When reporting scat latrines or carcasses**, please include the day in which you observed the carcass, the apparent degree of decomposition, and GPS coordinates. **If you are interested in volunteering for collections, please contact me.** I have kits with field instructions I am happy to provide you.