Investigating the Presence and Trophic Transfer of Microplastics in Ex- and In-Situ North American Otters Through Scat and Diet Analysis

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**HOLD THE PLASTIC, PLEASE:**

**INVESTIGATING MICROPLASTIC INGESTION BY SEA AND RIVER OTTERS THROUGH SCAT AND DIET ANALYSIS**

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**BACKGROUND**

- Microplastics are ubiquitous and some types of otter prey items have been shown to contain microplastics.*
- There is less information available about microplastic ingestion and effects for animals in higher trophic levels than those in lower levels.
- Sea and river otters inhabit a wide range of habitats throughout North America and consume species that are also eaten by humans.

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**Why study otters?**

**SEA OTTERS**
- *Enhydra lutris*
  - Endangered marine mammal
  - Regarded as a key species for their role in structuring coastal nearshore communities
  - Consume 25–30% of their body weight in food per day

**NORTH AMERICAN RIVER OTTERS**
- *Lontra canadensis*
  - Apex predator
  - Often regarded as a bioindicator species due to dependence on aquatic habitats and exposure to aquatic pollution
  - Consume a variety of prey (fish, crayfish, small mammals, etc.)

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**GOALS:**

1. Quantify, classify, and confirm suspected microplastics in scat from otters in a more remote vs. urban environment.
2. Analyze diet samples to evaluate role diet plays in microplastic ingestion by otters.
3. Analyze archived fecal samples to assess how microplastic ingestion by otters may have changed over time.
4. Analyze scat and diet samples in ex-situ otters to assess trophic transfer of microplastics in a controlled environment.

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**Methods:**

**Collection:**
- Wild otter samples collected from sites in CA and AK where sea otters haul out and river otters are known to be present
- Archived scat samples taken from Rodeo Lagoon and the Seattle Aquarium
- Captive otter samples taken from the Seattle Aquarium

**Analysis:**
- We are analyzing ingestion of these particles by quantifying and classifying them in scat samples from ex- and in-situ otters using a non-invasive method.
- Ingestion by otters may have changed over time.
- We will compare samples from populations in more remote vs. urban environments.

**Sample collection sites:**

- Kachemak Bay
- Glacier Bay
- Seattle Aquarium
- Rodeo Lagoon
- Elkhorn Slough

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**Thank you!**

*Thanks to the Seattle Aquarium, the IUCN Otter Specialist Group, the River Otter Ecology Project and the USGS!*

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*Collection: Analysis: Digest biological material with 20% KOH and incubate at 50°C for 72 hours*