

Using eDNA to Detect Endangered Tidewater Goby, *Eucyclogobius newberryi*, in Northern California's Lost Coast

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Research Importance

- The Northern tidewater goby is an endangered species that is endemic to the estuaries and brackish lagoons found along northern California's coastline.
- Previous sampling for the presence of *E. newberryi* was conducted from Del Norte to Mendocino County, but the Lost Coast was bypassed due to difficult terrain.
- The Lost Coast is the most remote and rugged shoreline in all of Northern California which has discouraged sampling of possible tidewater goby presence.
- Tidewater gobies are essential to estuarine ecosystems as they are food sources for many commercially important fish species.
- The project aims to sample the Lost Coast in its northern and southern range for the presence of *E. newberryi*.



Objectives for the Project

- Detect the presence or absence of *Eucyclogobius newberryi* in the Lost Coast in Northern California using eDNA.
- If presence is detected, annual sampling can be conducted to collect more data to study Northern tidewater goby population dynamics.

Locations

- Sampling for tidewater goby eDNA will take place at the Bear River, Mattole River, and Usal Creek in the Lost Coast.
- These sites were selected because they were the most likely bodies of water that will support *E. newberryi*.



Environmental DNA collection

- Environmental DNA is a noninvasive way to detect endangered species without capturing the animal.
- Three to ten 2L water samples will be collected from multiple sites at each estuary distanced at least 100 m among each other to enhance the chances of detecting *E. newberryi*.
- eDNA will be extracted from water samples using the Qiagen DNeasy Tissue and Blood Kit, if present.



Why sample the Lost Coast?

- Detecting the presence of tidewater goby would provide the opportunity to study and better understand the metapopulation dynamics of *E. newberryi* aiding in the conservation efforts of this species.



References

Kinzinger, A. P., M. Hellmair, W. T. McCraney, D. K. Jacobs, and G. Goldsmith. 2015. Temporal genetic analysis of the endangered tidewater goby: extinction-colonization dynamics or drift in isolation? *Molecular Ecology* 24(22):5544–5560.