

More than just a **fad**? Endangered false killer whale movements in relation to fish aggregating devices (FADs) in Hawai'i

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WHY IS IT IMPORTANT?

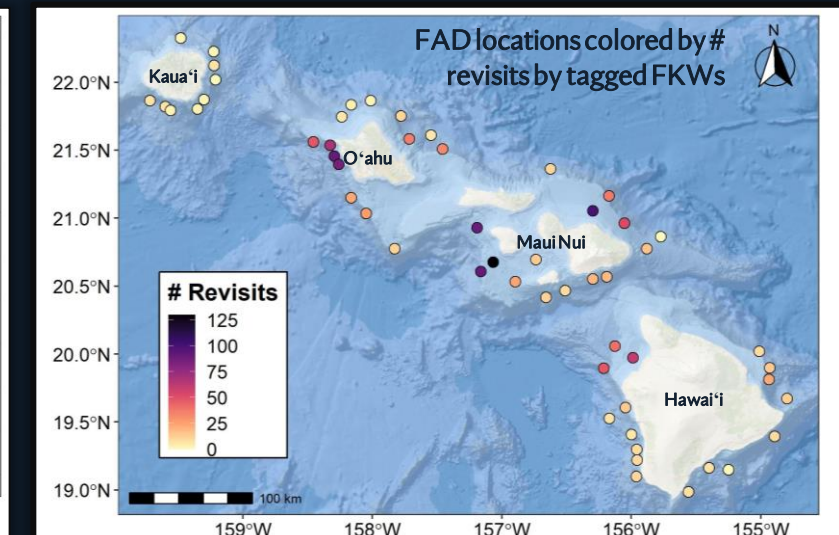
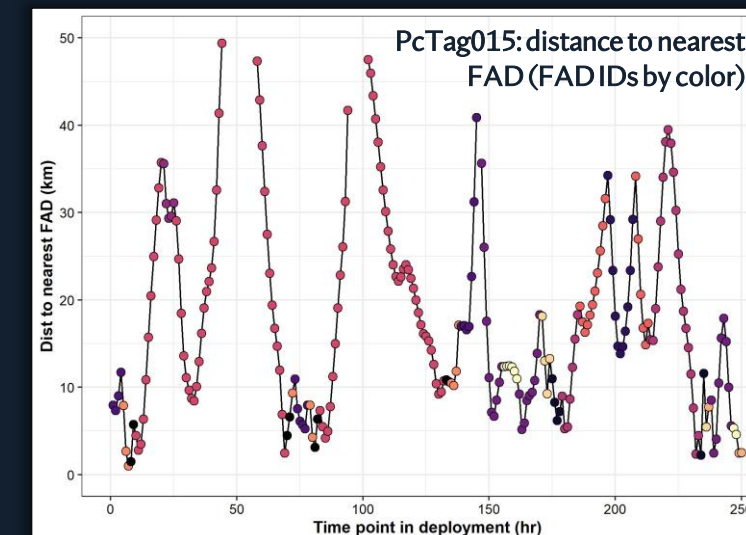
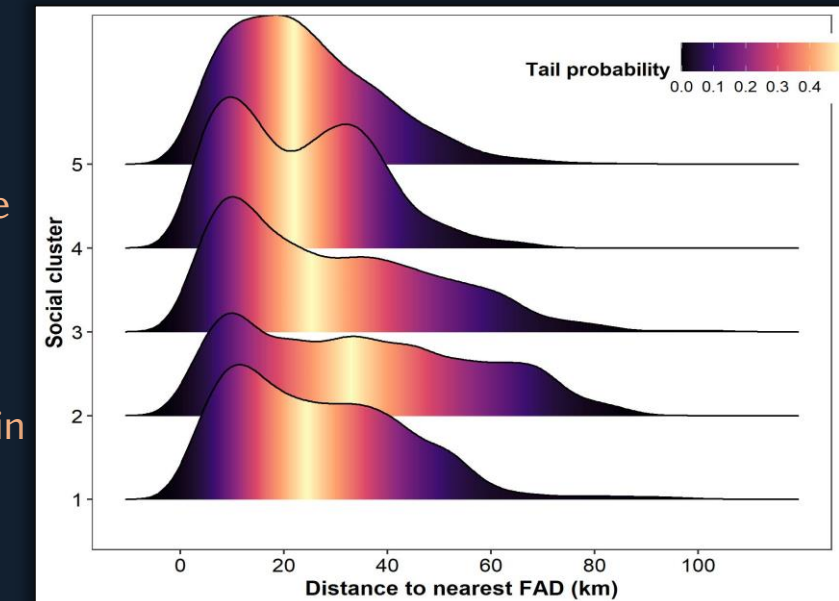
- The main Hawaiian Islands are home to an endangered, resident population of false killer whales (FKWs)¹
- Interactions with nearshore fisheries are thought to be the greatest threat facing this population^{1,2,3}
- State-sponsored fish aggregating devices (FADs), anchored buoys designed to attract schools of pelagic fishes (known prey of FKWs), are deployed throughout FKW's range⁴
- Fishermen often report that FKWs are regularly found around FADs, but little is known of their association with FADs over longer periods of time and *whether FADs exacerbate the risk of fisheries interactions*

WHAT WE DID

- Location data from 43 satellite tag deployments on FKWs^{1,5,6} (2007-2020) fit to continuous-time correlated random walk model and predicted hourly via the *crawl* package^{7,8}
- Locations were re-routed around land using the *pathroutr* package⁹
- Hourly locations were related to FAD locations, accounting for FADs that were missing during any deployment
- Recursion analysis was done to gain insight into FADs frequently revisited by tagged FKWs via the *recurse* package¹⁰

SPATIAL AND TEMPORAL VARIATION IN ASSOCIATION WITH FADs

- FKWs infrequently directly associated with FADs. This trend generally maintained across age/sex classes, and diel and lunar cycles
- Cluster 2 FKWs spent most of their time slightly farther away from FADs, compared to other social clusters
- The FADs frequently revisited within a 5km radius varied in space, and fell within their high-use areas
- When FKWs were close to FADs, they didn't stay there for long



Conclusions and next steps

- Preliminary results presented here provide an initial step towards understanding the role of FADs in FKW-fisheries interactions
- Further analyses are needed to disentangle associations with FADs and coincidental overlap with their high-use areas (e.g., determine state-space model estimated movement behaviors), as well as the influence of interacting environmental and temporal variables, and differences among demographics
- Private illegal FADs do exist and may have an influence that we are unable to quantify

Full list of funding sources, permit numbers, and references available at: <https://github.com/makratofil/bls7-fkw-fads-presentation>
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FKW and FAD photos © Jordan Lerma, Amy Van Cise, Robin Baird, Dan McSweeney, Daniel Webster/Cascadia Research Collective; Tuna photo © Kimberly Jeffries; We thank Daniel Webster, Greg Schorr, Allan Ligon, and Colin Cornforth for deploying satellite tags, and Kim Holland for information on FADs; We thank Erin Oleson/PIFSC for providing data on 5 satellite tagged endangered FKWs.

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For more info on our work visit <https://www.cascadiaresearch.org/hawaiian-cetacean-studies/false-killer-whales-hawaii>