MBIO 612 Final Project

'īlio holo i ka uaua or Hawaiian monk seals (HMS; *Neomonachus schauinslandi*) are an endemic and endangered species in Hawai'i with approximately 1500 seals remaining in the population. Very little is known about the underwater acoustic communication of free-ranging or wild HMS. In fact, no one has ever recorded or described calls for free-ranging HMS. This is important because other marine mammals use sound as their primary sensory modality for foraging, mating, navigation, and communication. All the information known, has come from one adult male seal in human-care, Kekoa. He produced 6 underwater low-frequency call types throughout the year with an increase during mating season suggesting that calls are used for reproductive purposes.

To fill the knowledge gaps, the aim of this study was to detect and categorize underwater vocalizations at Lehua Rock, Niʻihau and to describe the temporal patterns in calling behavior. To do this, a passive acoustic monitor, known as a SoundTrap 500F, was deployed at a popular scuba diving site at Lehua Rock in May 2021. Continuous recording at a 96kHz sampling rate was collected until the sixth day from deployment when a monk seal damaged the hydrophone. The data was audio-visually inspected on a spectrogram for 5 minutes per hour, every hour, for each day to detect and classify vocalizations and other anthropogenic and biological sound sources. Spectrograms are a way to visualize sound with the y-axis as the frequency or pitch, the x-axis as time, and the color representing the amplitude or how loud the sound is. The start time, end time, call type, and call amplitude were recorded for each biological and anthropogenic sound. “Species.Code” is the type of species making the sound, “Call” is the type of sound it is, “Date” is the day the call was made, “Start.time” is the beginning of the call, “End.time” is the end of the call, “Parameter.1” is the amplitude or loudness of the call, and “Parameter.2” is a column specifically for the whoop call type to record the number of whoops in a series. Are calls more frequent on days without tourism activity? How is call frequency affected by the vertical migration?

