Text S1. *Exclusion of wave movements from electric rock data*

Raw data from the 20 electric rocks showed 9055 movements, with most (68%) attributable to dates when waves were large enough to move the rock hundreds of times in a day (PIFSC 2023). The bottom surge of wave events from N. Pacific storms rapidly move the rocks, so they record a series of movement detections that appear in the data as obvious vertical steps (ranging between 121 and 1019 counts per event). Electric rocks deployed at shallow depths detect more movements in a wave event (Fig. S1A). Electric rocks vary in how they are wedged in the bottom, so not all rocks in a depth cluster behave the same during a wave event. We could exclude those dates from the data by identifying the threshold when the daily mean wave period was large enough to start moving electric rocks. Accounting for differences in arrival times due to latitude, we plotted the frequency of electric rock movements by mean wave period. As expected, our shallowest rocks started to exhibit rapid movements at lower mean wave periods (11 sec) (Fig. S1B) than the rocks deployed deeper (12–13 sec). For consistency, we excluded all dates with pulse increases and mean wave periods above 11 sec. The remaining data set was 1221 potential monk seal tips for the analysis.

The peak in numbers recorded among the eight clusters of electric rocks deployed ranged from 0.67 to 11 tips per day — much less than the 100+ movements associated with wave events. The three 2001 clusters of electric rocks on the atoll terrace were limited to just summer-fall months when the sea state was calmer and there were few wave events to exclude days (Fig S2 left column). The 2002 and 2003 year-round deployments at the terrace and two bank summits included winter months when winter storms excluded many more days (Fig S2 center and right column). For the year, the seasonal temperature varied by as much as 6 degrees Celsius.

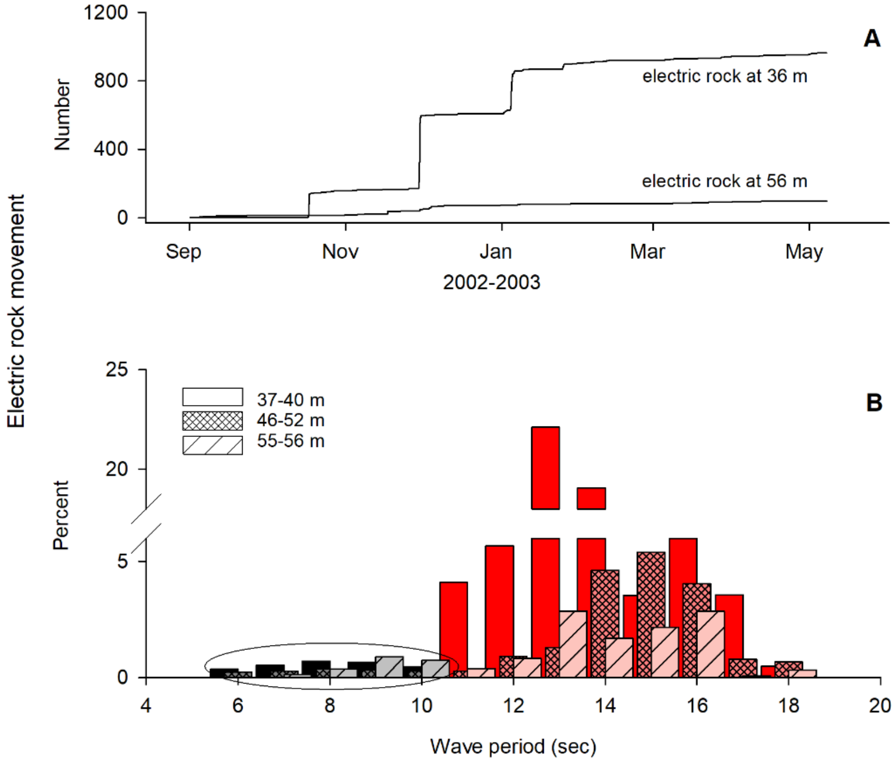

Figure S1. A) Two electric rocks deployed for the same period but at different depths showing the shallower rock (top line) is more susceptible to detecting wave events (stepped-increases in number) than the rock at deeper depths. B) Percent all detections by wave period for the three depth ranges, movements in the red columns attributed to wave energy and excluded, leaving the circled data "tips" for future analysis.

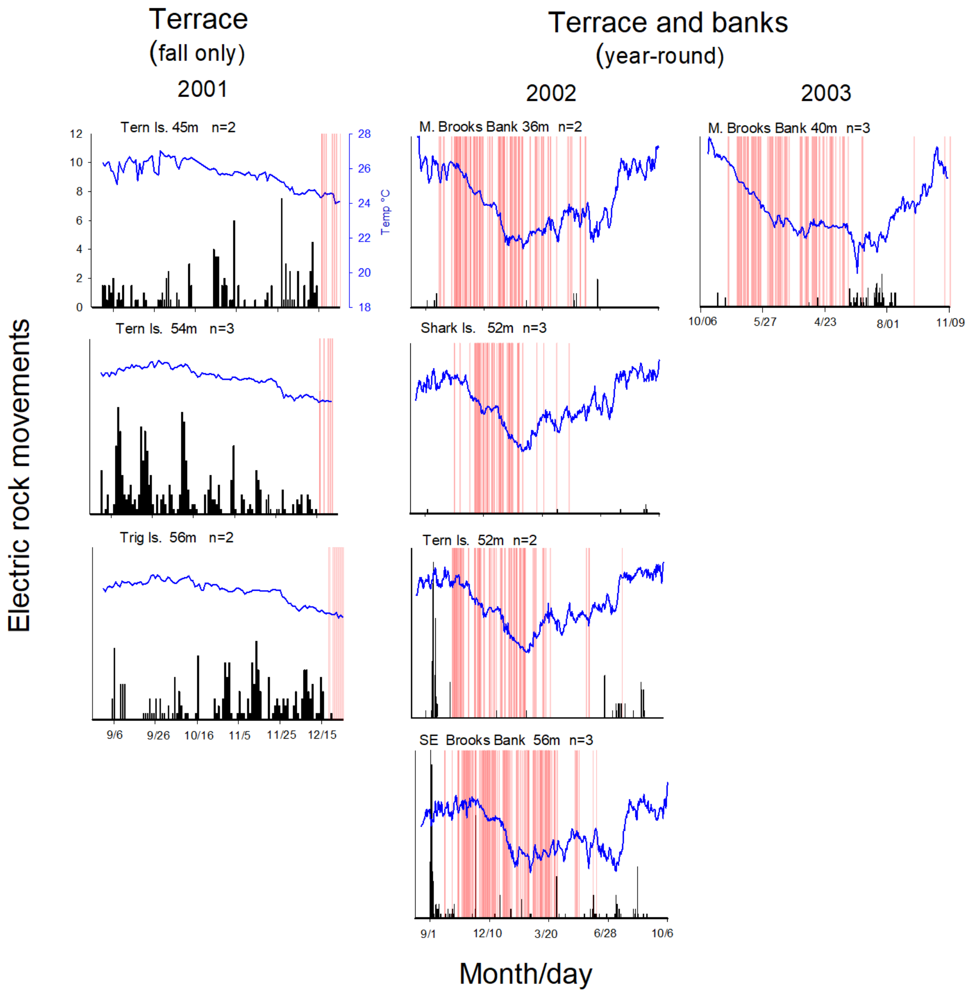

Figure S2. Black histograms are the electric rock tips for the deployed clusters of rocks normalized by their number. The left column is the fall of the 2001 monitoring of the terrace, the central column is the 2002 year-round monitoring of the two terrace sites and two bank sites, and the right column is the 2003 year-round monitoring of the shallow bank summit. The red indicates the dates of detected movement excluded due to wave influences. The blue line is the temperature in Celsius.

Text S2. *Monk seal patterns in the data*

The patterns seen in the tip data are consistent with the searching behavior of monk seals observed with the seal-mounted video cameras. The high peak in the number of tips for the shortest elapsed time bins (15−120 sec) for searching within each rock cluster (Fig. S3) is consistent with the targeted rock-to-rock searching behavior seen in the monk seal videos. Even though we know seals do quick rock-to-rock searches, it is also possible that the short durations result from multiple seals feeding together. The peak at the banks showed a steeper exponential decline than the more gradual decline seen for the terrace. Intuitively, this could mean that the sizable travel to the banks means the monk seals' foraging effort will be more directed and less opportunistic.

We expected higher counts on electric rocks placed closer to the seals' beach haulout since there is a higher probability of seals encountering the electric rocks as they come and go from the beach. Correlation significance was limited to those placed on the terrace, whereas the rocks at the banks had intermediate search levels with no effect of distance (Fig S4). This difference may indicate two types of foraging, first is local area browsing (terrace) with seals visiting the immediate area adjacent to the beach haulout, and second, are longer-distance trips (banks) farther out into the full home range of the colony (Curtice et al. 2011).

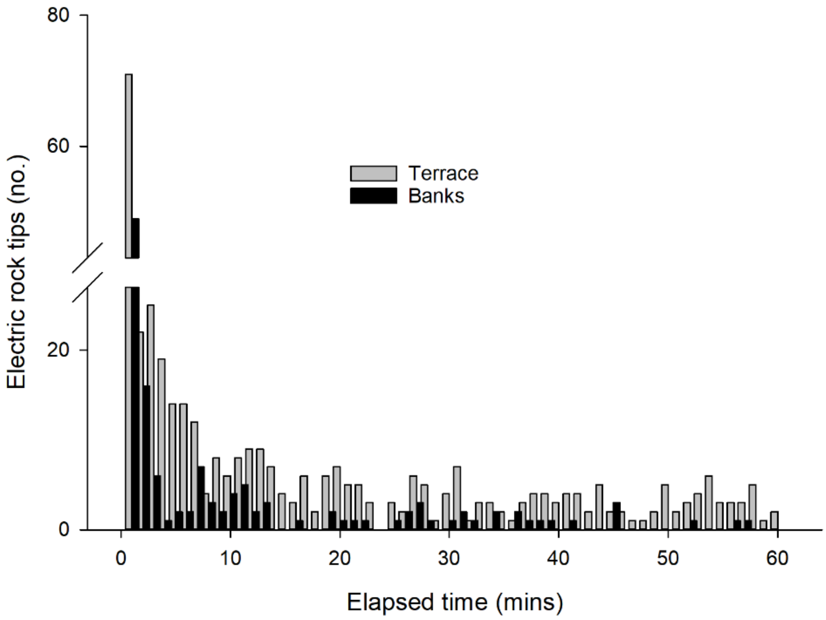

Figure S3. The distribution of the within-cluster time gaps between successive tips of electric rocks shows a peak in the number of tips for the shortest time intervals— a pattern consistent with the observed rapid rock-to-rock searching used by some monk seals.

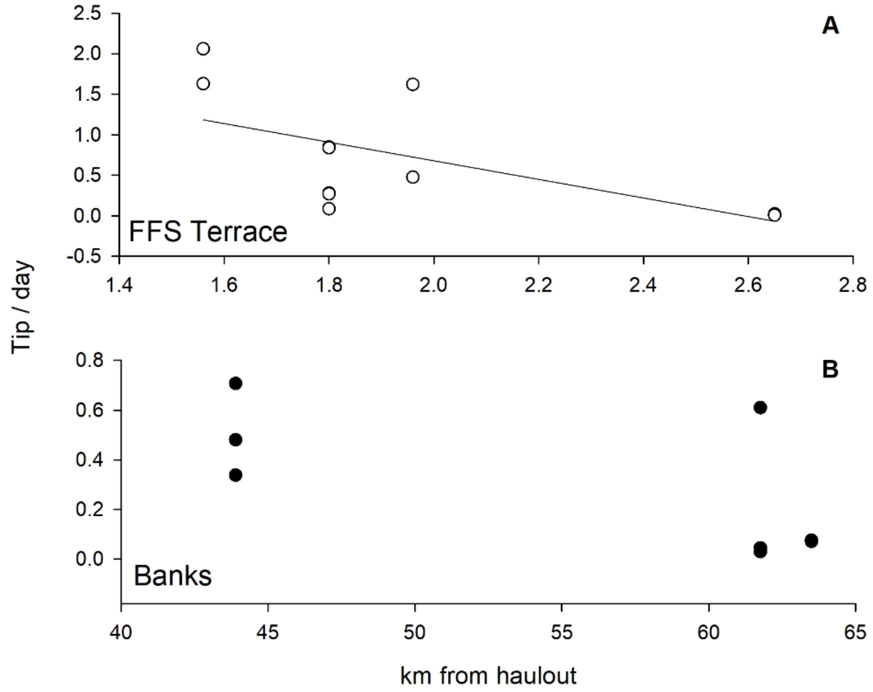

Figure S4. Mean tips per day of electric rocks with distance from the beach haulout. The top panel shows some significance for rocks on the terrace, whereas the bottom panel for electric rocks placed on the banks much farther away shows no similar relationship.

References

Curtice C, Schick RS, Dunn DC, Halpin PN (2011) Home range analysis of Hawaiian monk seals (*Monachus schauinslandi*) Based on colony, age, and sex. Aquatic Mammals 27 (3) 360-371.

PIFSC (Pacific Islands Fisheries Science Center) (2023) Monitoring the diurnal and seasonal foraging of Hawaiian monk seals in mesophotic rubble habitat using seafloor event loggers called "electric rocks.", https://www.fisheries.noaa.gov/inport/item/70346.