ABSTRACT
This study was conducted from June through August 2004 in Burrow’s Channel, a candidate marine reserve in Skagit County, Washington. Bottomfish density was estimated once a month with SCUBA surveys at two sites (A and B) separated by 700 m. Monthly fish density was higher at site A (425.0 fish/ha) than at site B (241.7 fish/ha); however, the difference was not significant due to small sample size given the monthly variability (paired t = 3.49, p = 0.073, Power 0.05 = 0.48; data were ln-transformed for analysis). Harbor seals (Phoca vitulina) were observed from land with a theodolite 2 h from slack tide (n=187 h). Throughout the study period, the numbers of seals in site A were higher than those in site B (67.5% versus 32.5%; \( \chi^2 = 4.90, p = 0.027, n = 40 \)). Tracking of 22 focal seals revealed that individuals remained in the candidate marine reserve for 1:42 SD 1:06 h and engaged in possible foraging — defined as erratic swimming and frequent diving in a localized area — in 82% of tracking sessions. Preliminary results indicate that seals use the candidate marine reserve to forage and suggest that they respond to variations in prey density at small spatial scales. Their potential impact on bottomfish populations is currently unknown.

INTRODUCTION
Marine reserves manage fisheries and conserve biodiversity by increasing abundance and average size of exploited species within their boundaries as well as in adjoining, non-protected sites. However, the effectiveness of marine reserves might be compromised if predators increase their numbers and foraging frequency in the reserve rather than in adjacent sites. The previous scenario assumes that predators respond to increased fish density at small spatial scales. We present preliminary results of an on-going project that tests the prediction that harbor seals will exhibit an aggregative response to prey density; i.e. seals will more frequently visit sites where fish density is higher.

OBJECTIVES
1. Quantify the density of bottomfish at two locales within the candidate marine reserve.
2. Compare the visitation of harbor seals to a “high-density” bottomfish area (Site A) versus a “low-density” area (Site B).
3. Describe the use of a candidate marine reserve, by harbor seals, prior to protection.

METHODS
- Conducted monthly SCUBA surveys to characterize bottomfish density at two sites (A & B) within a candidate marine reserve (Figs. 1 & 2).
- Performed visual scans at 15-min intervals to count harbor seals within the study area.
- Observation periods were 4 h in length, were centered around slack tide, and occurred within the hours of 6 am-9 pm.
- Used a theodolite to determine seal positions within the candidate marine reserve and relative to Sites A & B (Figs. 1 & 3).
- Conducted tracking sessions of focal seals to determine behavior and length of time spent within the candidate reserve (Table 1).

RESULTS: PREY DENSITY
- Bottomfish density was higher at Site A than Site B (Fig. 4).

RESULTS: PREDATORS
- More seals were sighted in proximity to Site A, than Site B (Fig. 5).

- 82% of tracking sessions (n = 22) were categorized as foraging (Table 1).
- A single bottomfish predation event was recorded off-effort.
- Individual tracked seals remained in the study area for 1:42 SD 1:06 h.

CONCLUSIONS
- Patches of differing bottomfish density are present within the candidate marine reserve.
- Seals were more frequently observed in proximity to a “high-density” bottomfish area than near a “low-density” area.
- Seal presence does not necessitate bottomfish predation.

Although seals do forage in Burrow’s Channel, no bottomfish predation events were recorded during observations.

FUTURE WORK
- Ensure independence of seal sightings by randomly choosing one scan per observation period.
- Measure distances of independent seal sightings to Sites A & B.
- Analyze observations & tracking sessions from 2005.
- Maintain contact with Washington Dept. of Fish & Wildlife regarding diet analysis from nearby haulouts.

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