

Lunch Like No Otter

An Overview of Sea Otter (*Enhydra lutris*) Foraging Behaviour

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Sea otters feed on **benthic invertebrates** -- organisms that live on the surface of ocean bedforms (1).

BEHAVIOUR

FORAGING DIVES in water allow for the capture of prey (1). They must swim back to the surface of water to handle and consume their prey (1).



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Juveniles require high levels of **parental care** for **feeding** and **protection from predation**, which affect patterns of foraging dives (2).

A DEVELOPMENTAL TIMELINE OF FORAGING BEHAVIOUR



HOW DOES PARENTAL CARE AFFECT FORAGING STRATEGY?



Mothers face a **trade-off** between foraging and pup protection (5).



Mothers engage in **shallower dive depths in foraging**, to reduce time away from young (6).



Maternal **foraging time increases**, with increasing pup size (6).



Nocturnal foraging observed in mothers with dependent pups (3, 7).

THE FORMULA TO OPTIMAL FORAGING



How do sea otters decide **where** and **what** to forage?

Sea otters are typically **generalized predators**: one food source will be depleted in a region before choosing another food (8).

OPTION 1:

- + **increase** DIVE DEPTH (1,5, 6)
- + **obtain** HIGH CALORIC FOOD (6)
- + **increase** TIME foraging (1,5,6)
- + **increased risk of** PREDATION (2)

Often chosen by:
- **males** (1)
- **females without pups** (2,5)

OPTION 2:

- **decrease** DIVE DEPTH (1,5,6)
- **obtain** LOW CALORIC FOOD (6)
- **decrease** TIME foraging (1,5,6)
- **decreased risk of** PREDATION (2)

Often chosen by:
- **females with pups** (2,5,6)
- **young pups new to independent foraging** (5)

REFERENCES

- (1) Bodkin, J. L., Esslinger, G. G., & Monson, D. H. (2004). Foraging depths of sea otters and implications to coastal marine communities. *Marine Mammal Science*, 20(2), 305–321. <https://doi.org/10.1111/j.1748-7692.2004.tb01159.x>
- (2) Cortez, M., Wolt, R., Gelwick, F., Osterrieder, S. K., & Davis, R. W. (2016). Development of an altricial mammal at sea: I. Activity budgets of female sea otters and their pups in Simpson Bay, Alaska. *Journal of Experimental Marine Biology and Ecology*, 481, 71–80. <https://doi.org/10.1016/j.jembe.2015.05.020>
- (3) Payne, S. F., & Jameson, R. J. (1984). Early behavioral development of the sea otter, *Enhydra lutris*. *Journal of Mammalogy*, 65(3), 527–531. <https://doi.org/10.2307/1381114>
- (4) Carss, D. (1995). Foraging behaviour and feeding ecology of the otter *Lutra lutra*: A selective review. *Hystrix, the Italian Journal of Mammalogy*, 7(1-2), 179–194. <https://doi.org/10.4404/hystrix-71-2-4069>
- (5) Thometz, N. M., Staedler, M. M., Tomoleoni, J. A., Bodkin, J. L., Bentall, G. B., & Tinker, M. T. (2016). Trade-offs between energy maximization and parental care in a central place forager, the sea otter. *Behavioral Ecology*, 27(5), 1552–1566. <https://doi.org/10.1093/beheco/arw089>
- (6) Osterrieder, S. K., & Davis, R. W. (2009). Summer foraging behaviour of female sea otters (*Enhydra lutris*) with pups in Simpson Bay, Alaska. *Aquatic Mammals*, 35(4), 481–489. <http://doi.org/10.1578/am.35.4.2009.481>
- (7) Esslinger, G. G., Bodkin, J. L., Breton, A. R., Burns, J. M., & Monson, D. H. (2014). Temporal patterns in the foraging behavior of sea otters in Alaska. *The Journal of Wildlife Management*, 78(4), 689–700. <http://doi.org/10.1002/jwmg.701>
- (8) Ostfeld, R. S. (1982). Foraging strategies and prey switching in the California sea otter. *Oecologia*, 53(2), 170–178. <http://doi.org/10.1007/bf00545660>