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## Trap Building



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### Synonyms

[Predation](#); [Trapping](#); [Web Construction](#)

### Definition

Trap building is a method by which predators catch prey through the use of a forged structure.

Trap building is a method by which predators catch prey through the use of a forged structure. Trap building is evident in many animals, primarily invertebrate species and humans, that have separately converged on trap building as a specialized form of hunting. There are two evolutionary routes to building traps. Humans demonstrate the “big-brained” route to building traps whereas other trap-building animals demonstrate the “small-brained” route (Hansell, 2007). Humans use collected materials and behavioral flexibility to construct traps that catch prey in water, land, and air, whereas other animals exhibit species-specific trap designs that rely on simple and relatively inflexible construction behaviors and, often, self-secreted materials. Despite the many differences between the trap building of humans

and other animals, similarities in nonhuman and human trap types are evident, suggesting there are a limited number of good solutions to the problem of catching prey by trapping.

Spiders build traps via web-making. The orb web spider (*Araneus diadematus*) constructs a spiral web that has a specific capture thread placed on a radial array of threads (Zschokke, 1996). Orb web spiders use a consistent set of tactics in variable sequence to construct a seemingly complex design. When an orb web spider is isolated from birth, it will still construct a web (Zschokke, 1996). *Zygiella x-notata* is a spider that uses a slightly different orb design and rests at the edge of the web where it can hide from unsuspecting prey (Hansell, 2007). Any disturbance to the web causes a vibration, prompting the *Zygiella x-notata* to rush out and kill the prey. Spider webs are traps tailored to capture a particular prey and some flying insects, like butterflies and moths, have evolved the anti-capture countermeasure of detachable scales. An evolutionary arms race between predator and prey is also evident in the trap building of the bolo spider (*Mastophora hutchinsoni*). The bolo spider is a master moth-catcher, using chemicals that mimic female moth sex attractant signals to lure male moths into the web (Haynes et al., 2002). Spiders demonstrate species-specific web design and their trap-building behavior is highly specialized, genetically determined, and inflexible. The silk created by spiders is an example of a self-secreted building material. Silk is preferable to mucus for

building nets because it is more durable, stronger, can be spun on land or in water, and it recovers its shape after being deformed (Hansell, 2007).

It appears that, in many trap-building species, natural selection has modified mucus secretions that formerly assisted with locomotion to trap prey. *Praxillura maculata* is a burrow-dwelling marine worm that uses mucus to build a net to capture fine particles suspended in water (Hansell, 2007). *Gleba cordata* is a mid-water, oceanic snail with no shell that feeds on plankton. To capture plankton, this species secretes and deploys a finely meshed, sticky mucus net that can be one-third of a meter or more across (Hansell, 2007). *Oikopleura dioica* is a small, tadpole-like creature that builds a capsule of mucus as both a dwelling and a trap, capturing plankton as prey (Hansell, 2007). A multipurpose structure like the dwelling/trap of the *Oikopleura dioica* does not require imagination or behavioral flexibility; thus, complex architecture is possible with a small brain and efficient use of materials. These behaviors are likely highly canalized. For example, Kloköcovnik and Devetak (2014) demonstrate that non-pit-builder antlions show less stereotypic predatory behavior compared to pit-building antlions.

The burrowing owl is an example of an animal that uses bait to attract prey, although the owl's burrow may not qualify as a trap. The burrowing owl gathers cow dung and places it at the burrow entrance to attract dung beetles and other insects as prey (Smith & Conway, 2007). The built structure of the burrowing owl is not a trap because direct predation is the method employed to

capture the insects. The prey is not trapped by the dung or by the burrow. By this definition, there are no birds that build traps (Hansell, 2007).

## Cross-References

- ▶ [Chemical Cues](#)
- ▶ [Convergent Evolution](#)
- ▶ [Maximizing](#)
- ▶ [Natural Selection](#)
- ▶ [Predator](#)
- ▶ [Prey](#)
- ▶ [Threat Posture](#)

## References

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