



## ABSTRACT

The giant Pacific octopus (*Enteroctopus dofleini*) is the most abundant octopus species found on the continental shelf of Alaska and it dominates the commercial catch of octopus within Alaska waters. There is no fishery directly targeting octopus, but they are taken as bycatch in trawl, longline, and pot fisheries throughout Alaska, with the majority of catch coming from Pacific cod (*Gadus macrocephalus*) pot fisheries. Recent changes to management of octopus within this region necessitate a more complete understanding of the fate of octopus captured and released during fishing operations. On-board fisheries observers collected data about octopus weight, sex, and condition at capture in a variety of Alaska groundfish fisheries from 2006-2011. A study aboard a commercial pot-fishing vessel in the southeast Bering Sea in January 2013 examined short-term delayed mortality of octopus held in running seawater tanks. A long-term delayed discard mortality study will occur at the Kodiak Laboratory seawater facility during 2013 and 2014 with octopus captured in Gulf of Alaska pot fishing operations. Results from the immediate and short-term delayed mortality studies indicate octopus are often released in excellent condition and are likely to experience low delayed mortality, especially in the pot fisheries in which they are most commonly captured. This research will aid in the management of octopus within this region.



## GIANT PACIFIC OCTOPUS

- ❖ Giant Pacific octopus are found throughout the northern Pacific Ocean from Japanese waters, throughout the Aleutian Islands, Bering Sea and the Gulf of Alaska and along the eastern Pacific coast as far south as northern California (Kubodera 1991).
- ❖ They are the largest species of octopus in the world reaching a maximum size of around 50 kg (Roper et al. 1984)
- ❖ Like most incirrate octopus this species is semelparous and thus females die after a single batch of eggs hatch (Kanamaru 1964, Sato 1996).
- ❖ Giant Pacific octopus in the Gulf of Alaska have a protracted reproductive cycle with peak spawning occurring in the winter to early spring months (Conrath and Conners, in press).



### References

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## PROJECT OBJECTIVES

- ❖ To assess the immediate mortality of giant Pacific octopus captured during commercial fishing operations utilizing North Pacific Groundfish observers from the AFSC Fisheries Monitoring and Analysis Division.
- ❖ To assess the short-term delayed mortality of giant Pacific octopus by holding octopus for 24-60 hours on board a commercial fishing boat and assessing condition and mortality during this period.
- ❖ To assess the long-term delayed mortality of giant Pacific octopus by obtaining octopus from commercial fishing operations and maintaining them in a laboratory setting for a period of 21 days.
- ❖ To determine if mortality observations from observers are an accurate reflection of the long term survival of octopus caught as bycatch in these fisheries.
- ❖ To examine seasonal or temperature dependent effects on the short term and delayed mortality of giant Pacific octopus captured as bycatch in different seasons of the year.
- ❖ To examine the feasibility of developing reflex impairment and performance indicator measures to enable accurate short term assessment of octopus mortality.

## OCTOPUS AS BYCATCH

- ❖ The octopus assemblage in the Gulf of Alaska is comprised of at least seven species but commercial catches within this region are dominated by the giant Pacific octopus, *Enteroctopus dofleini*.
- ❖ Octopus have recently been removed from the 'other species' group of groundfish by the North Pacific Fisheries Management Council (NPFMC) and annual catch limits (ACLs) have been established for this assemblage for 2011 and 2012.
- ❖ Due to this lack of data octopus catch limits were set based on historical incidental catch rates and it is likely these values are overly conservative. This issue is further exacerbated by the fact that catch accounting for octopus uses the conservative assumption of 100% mortality for all octopus caught whether retained or discarded.
- ❖ Octopus are caught incidentally in trawl, longline, and pot fisheries; however, the majority of the catch comes from Pacific cod pot fisheries There is concern that the establishment of ACLs for this group may unnecessarily constrain this and other commercial fisheries.

## RESULTS & FUTURE WORK

- ❖ Observer data indicated that over 90% of octopus discarded from vessels using pot gear were alive and in excellent condition. This is in contrast to other fishing gear types that result in much higher octopus mortality like trawl gear where mortality is generally over 50% and is often much higher.
- ❖ Octopus held in the short-term delayed mortality study showed no signs of delayed mortality or decline in condition (Conners and Levine, in prep).
- ❖ Longer-term delayed mortality studies will be initiated in January of 2014 and will continue through January 2015 with octopus obtained from the Pacific cod pot fisheries that occur in the fall and winter fisheries.
- ❖ These studies will compare initial octopus condition with condition after a period of 21 days in the laboratory and assess the feasibility of using reflex impairment to assess the condition of giant Pacific octopus caught as bycatch.
- ❖ These data may enable scientists to develop a gear-specific discard mortality factor which could be included in the catch accounting for octopus.