

Study questions/notes for Kelly Newton's talk:

- What is a 'trophically simple top predator'? (a top predator in that not many things eat it, but 'simple' in that it feeds closer to the bottom of the food pyramid such as Manta rays that eat euphausiids (krill – small shrimp). Others in this category are large baleen whales like fin whales, whale sharks and sea turtles.
- What did the fin whale tagging study show and why was it important? (fin whales were feeding during the day at around 100-200 m depth, which is where the krill were). This was an important study because Mantas eat krill too.
- When do Mantas feed? Mostly at night and mostly at the surface (10-50 m). This is an example of niche partitioning! Same food, different time of day
- Why are mantas vulnerable to overfishing? They are K-selected: late maturing, and only one pup every 2-3 years.
- What do the pop-up archival tags show, and how are the data retrieved? They show light, depth, temperature and location, retrievable by satellite (e-mail) when the tag pops off. Retrieving the tag itself is also good since they can get more data and reuse the tags if not too damaged.
- Why are the Mantas moving from the Gulf (El Paredo Island) in June to just north of Cabo in July to North of that in Aug/Sept.? These areas match their preferred water temperatures (22-27 degrees C) and Krill abundance (their food!).
- What other animals overlap with this pattern and the range of the Mantas (especially on the Pacific side of the Baja Peninsula)? Blue whales, leatherback sea turtles, and yellowfin tuna. All of these are following the same oceanographic features (cool water etc.), to which the krill are also tied.
- Why is the yellowfin tuna/Manta ray overlap so important? Mantas are caught as by-catch in the tuna fishery. Due to their K-selected life history, they cannot withstand high fishing pressure. We know it's a problem in the Eastern Tropical Pacific (the Mexico part of their range), but other places worldwide where they occur with tuna we have little data, so their numbers may be declining more than we think.
- What is bycatch?
- Are Mantas protected by law in Mexico? Yes!
- What are the population genetics studies of Mantas telling us? They tell us how many different species there are, how closely related different species of mantas are and more about population structure:
- How different *populations* of the same species differ in their genetic makeup. Are they different stocks? Should they be managed as different populations? Is there more fishery pressure on one population than another?
- Data show that the M. japonica is mostly a panmictic species (mixed genetic stock) except for one stock (the Costa Rica region). This suggests a nearshore and an offshore 'stock'
- Why is the Monterey Bay Aquarium funding this research?
- What is the Aquarium's mission, and why does their effort to have Mantas in captivity help them achieve that?
- Baja and the sea of Cortez are the Manta Diversity center of the world! (most species found there)
- Most are red listed IUCN