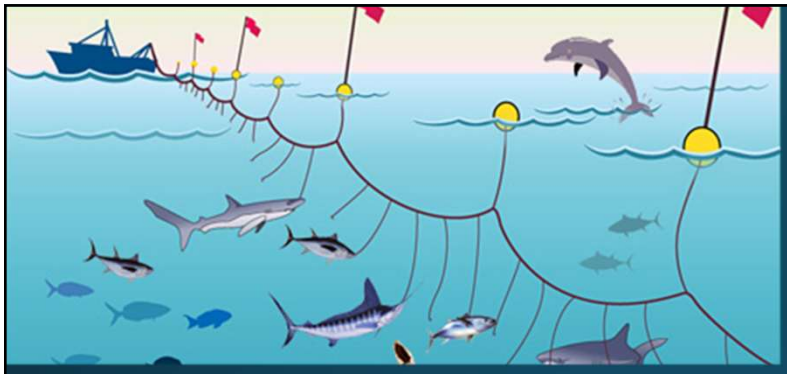
Sharks & Sustainable Fishing

Cartilaginous fishes

- Includes sharks, rays, skates and close relatives
- They share common features:
  - Jaws
  - Cartilage skeletons, not true bone
  - Fatty liver used for buoyancy
  - Lack swim bladder
  - Most have placoid scales
  - Leathery egg cases or live birth
- They are successful predators because they have pore-like structures near their snouts called **ampullae of Lorenzini,** which detect electrical currents of other organisms

Sharks in Danger

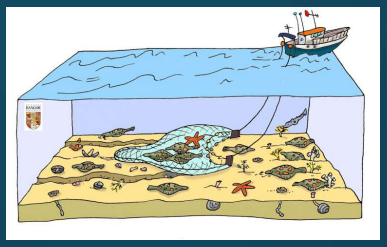
- Move than 500 species of sharks are known to science
- Of those, approximately 1/3 are at risk of extinction
- Humans kill ~100,000,000 sharks annually
- Many are killed for fins, but the second biggest source of shark deaths caused by humans is by-catch

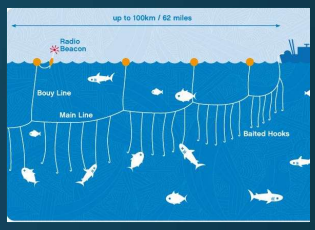


What is bycatch?

Just a few fishing methods…

- Bottom Trawling – Shrimp fisheries
- Long line fishing – Tuna, Swordfish, Chilean Sea bass
- Driftnet fishing
- Cyanide and Dynamite fishing
- Pots
- Dive-catching

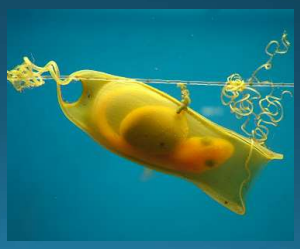




Buccal pumping or ram ventilation

Why are sharks vulnerable?

- Relatively slow growth
- Long time to reproductive age
- Few eggs/pups at one time



What is Sustainable Fishing?

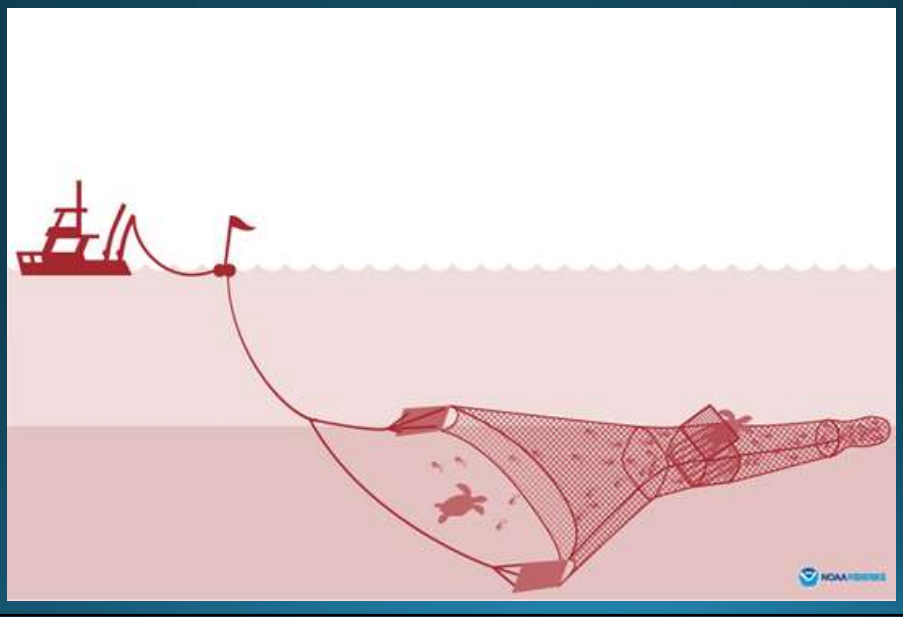
Fishing with long-term goals that include leaving a healthy and well-managed fish population worldwide while having no negative impact on marine habitats and other marine species.

Tackling Sustainable Fishing

- Circle hooks
- Purchasing locally
- Eating further down the food chain
- Aquaculture/fish farming
- Reducing fishing capacity
- Improvements to management and fisheries policy
- Fairer fishing partnerships
- Harsher enforcement to curb illegal fishing

Circle Hooks

TED – Turtle Exclusion Devices



What is Aquaculture?

According to NOAA

"The propagation and rearing of aquatic organisms in controlled or selected aquatic environments for any commercial, recreational, or public purpose"

Pros & Cons of Aquaculture

Pros

- Can increase jobs
- Increase revenue on city, state, and international level
- Reduce seafood trade deficit
- Help feed a growing US and world population
- Encourage local investment
- Can increase scientific knowledge and technology
- Can place an emphasis on protecting coastal waters
- May reduce fishing pressures

Cons

- Can conflict with other users of water bodies
- Can put excess pressure on wild stock
- Can amplify and transfer disease and parasites to wild species
- Can pollute water systems with excess nutrients, chemicals, and antibiotics
- Can compromise native gene pools
- Can threaten livelihood of fishermen
- Can be unpredictable for small local communities
- Can compromise the aesthetic beauty of the coastline

Aquacultures Regulatory Bodies

- NOAA (Supports fisheries management and development, and enforcement of guideline and protects species through habitat conservation)
- EPA (waste discharge)
- FDA
- National Pollution Discharge Elimination System
- State Regulations (CT and AZ)