

# It Isn't Easy Being Green in the San Joaquin: Green Sturgeon Passage



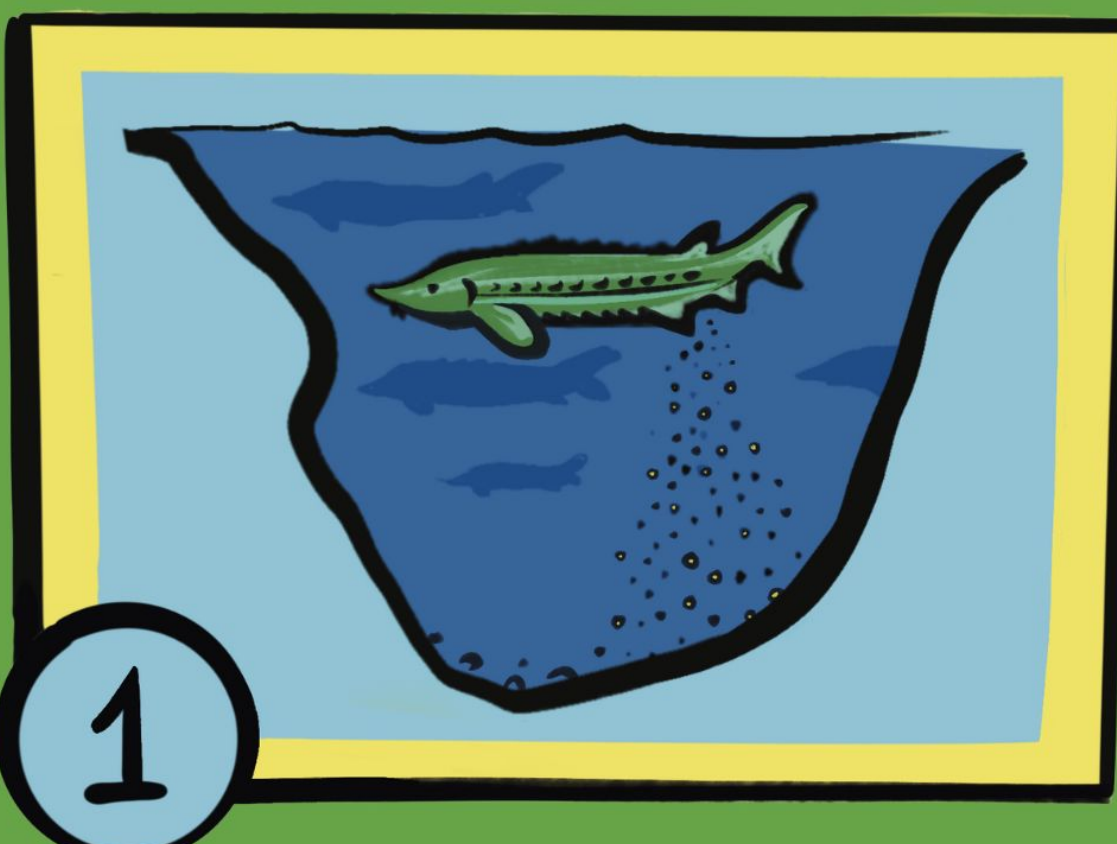
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<sup>2</sup>National Marine Fisheries Service



## Life Cycle

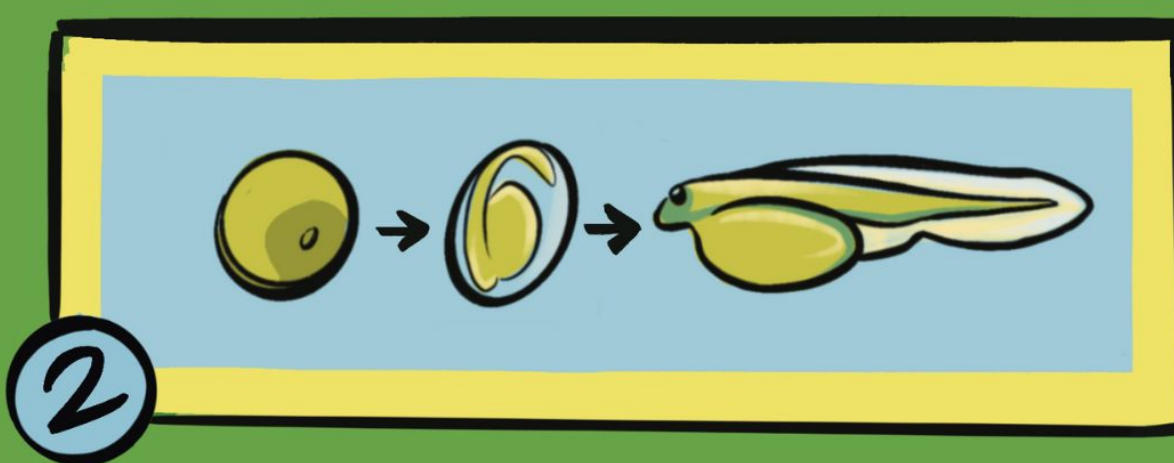


### Spawning



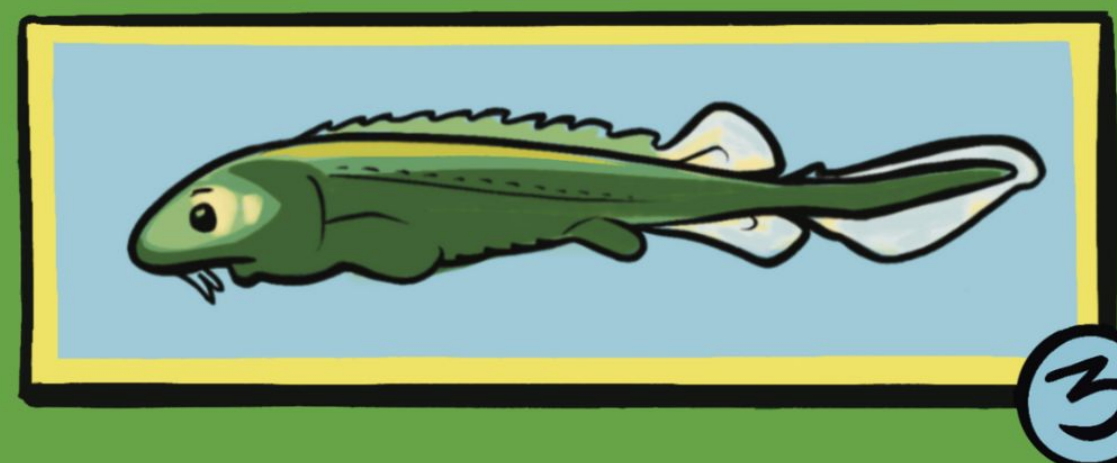
The green sturgeon journey in California starts with their migration back to their birthplace rivers during their spawning season from April to July in the Upper Sacramento, Feather, and Yuba Rivers.

### Egg to Larvae



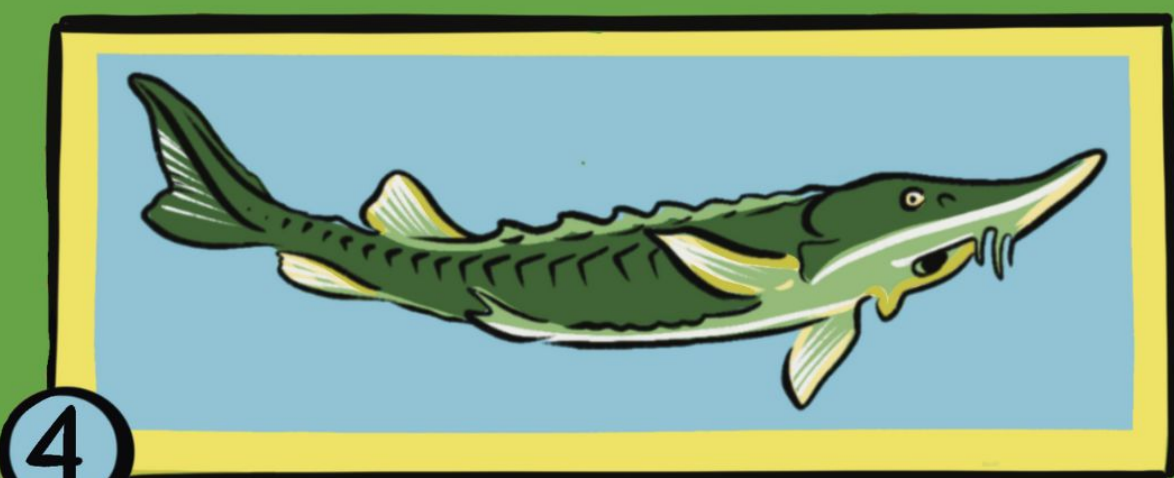
The sticky eggs cling to rocks at the bottoms of deep cold pools with high flows. After about 10 days the eggs hatch but the larvae remain among the protection of rocks to feed and grow.

### Young-of-Year



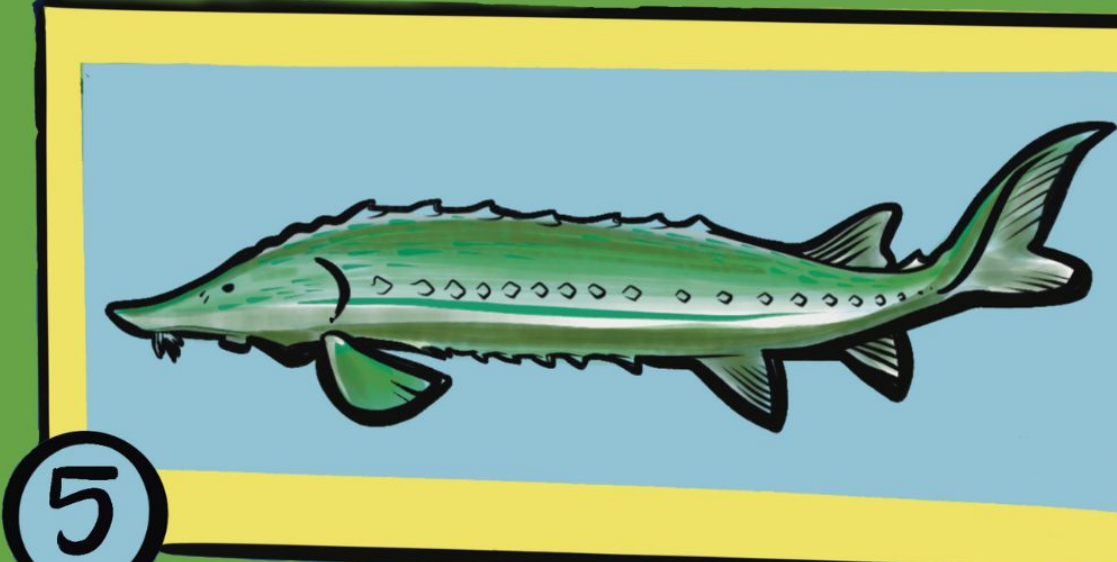
After about 45 days, the larval transforms, and their dorsal and protective scutes become visible. It is a critical time for survival and growth because they are vulnerable to predators as they prepare to move downstream.

### Juvenile



From age 1 to 5 years, juveniles move downstream and live and feed in the San Francisco-San Joaquin Delta. Juveniles typically travel to the ocean once they are 30-80 cm (~12-30 inches) long.

### Adult

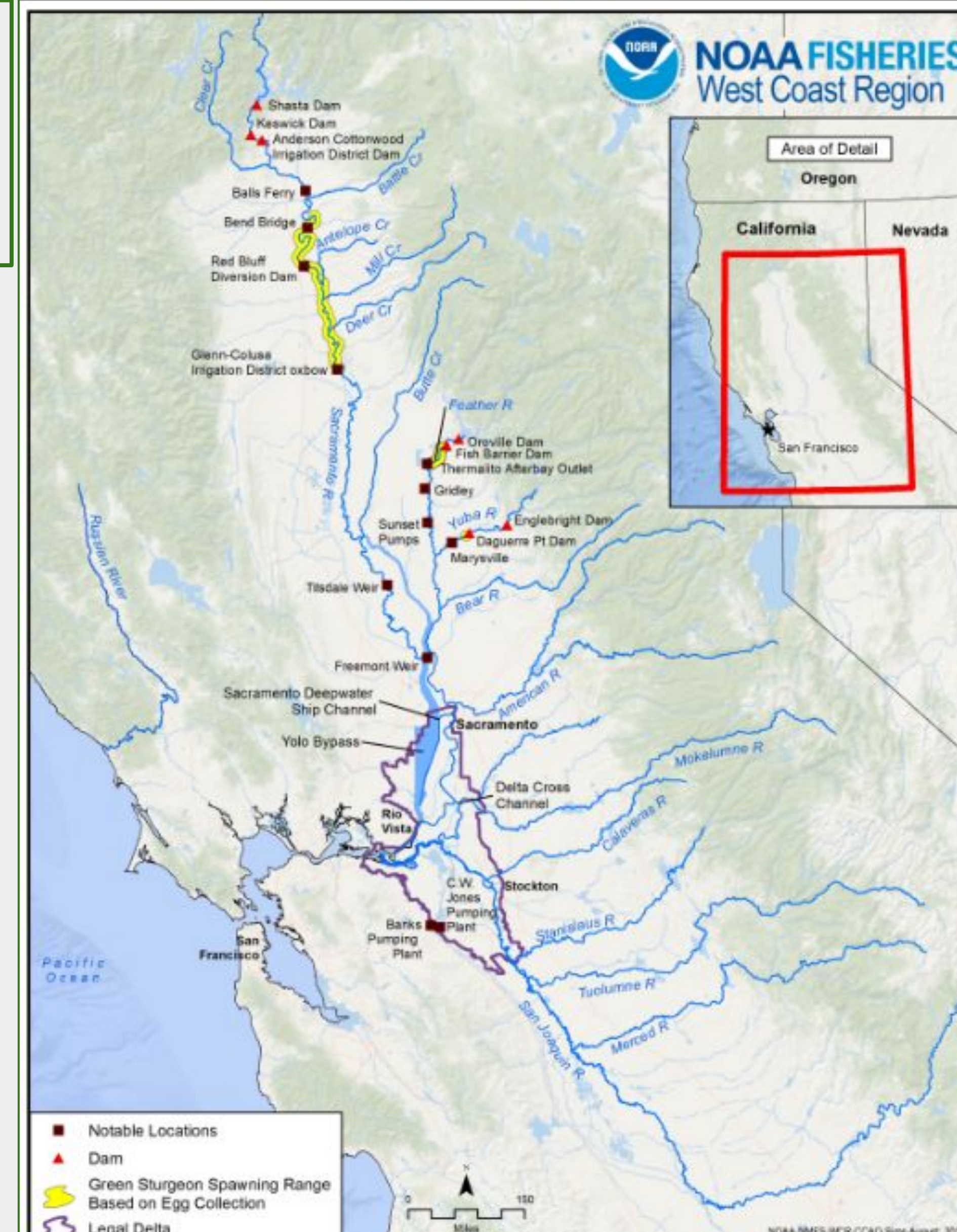
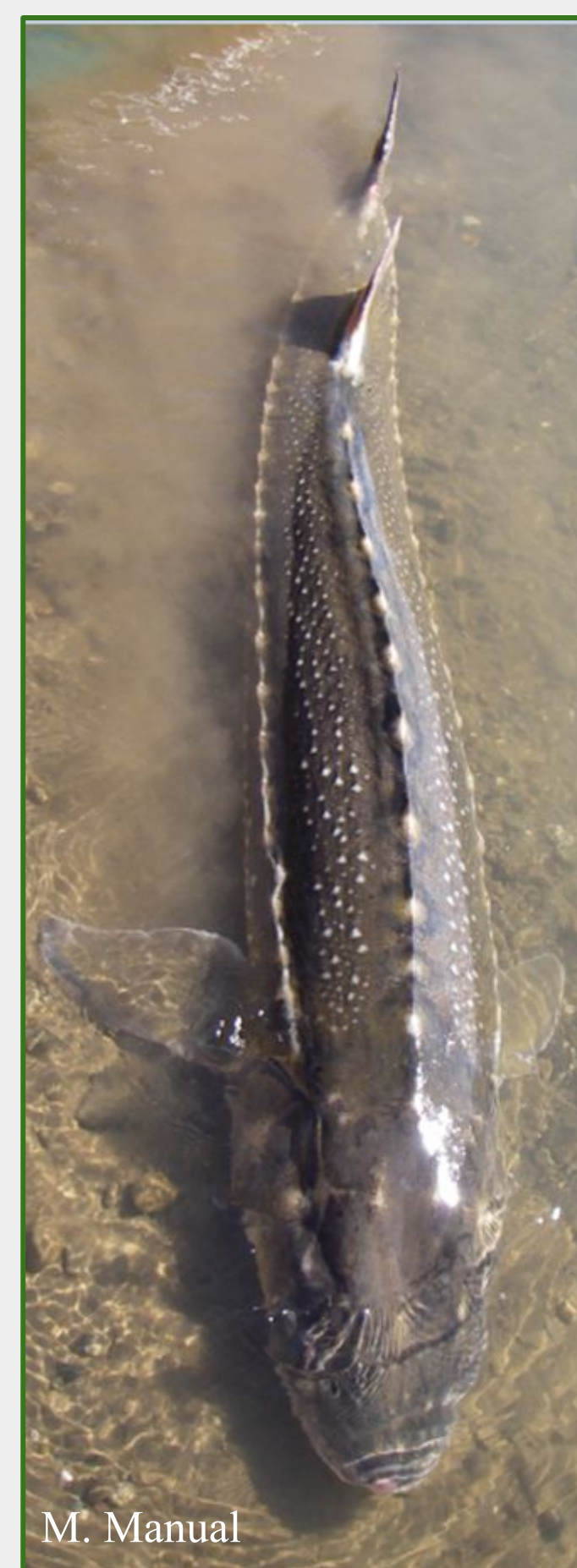


Green sturgeon have now developed more prominent features like a narrow-pointed snout and live in bays or estuaries along the West Coast. Once they've matured around 15 years, green sturgeon begin their return to their birth rivers to spawn every 2-6 years.

## Recovery

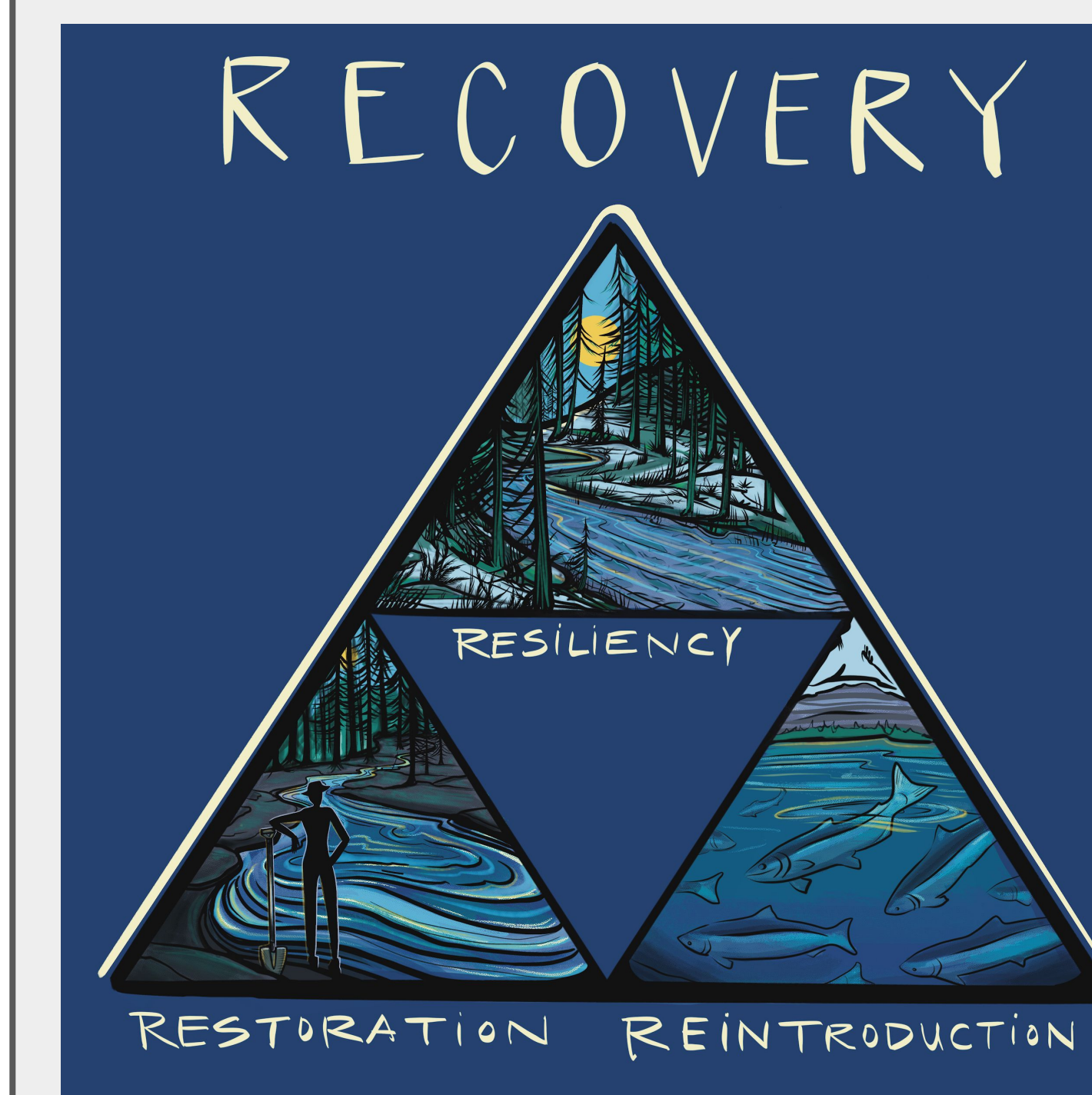
- Criteria for Recovery:
  - Adult southern Distinct Population Segment (sDPS) population at or above 3,000 for 3 generations.
  - At least two rivers in their historical range with successful spawning.
  - A net positive trend in juvenile and subadult abundance for at least 20 years.
  - A broad distribution of size classes representing multiple cohorts for 20 or more years.
  - No net loss of sDPS diversity from current levels.
- Threats to Recovery:
  - Limited or no access to spawning and rearing habitat
  - Inadequate water temperature and river flows
  - Poor water quality
  - Inadequate fish screen operations at water diversions
  - Poaching

For more information visit:  
<https://www.fisheries.noaa.gov/species/green-sturgeon>



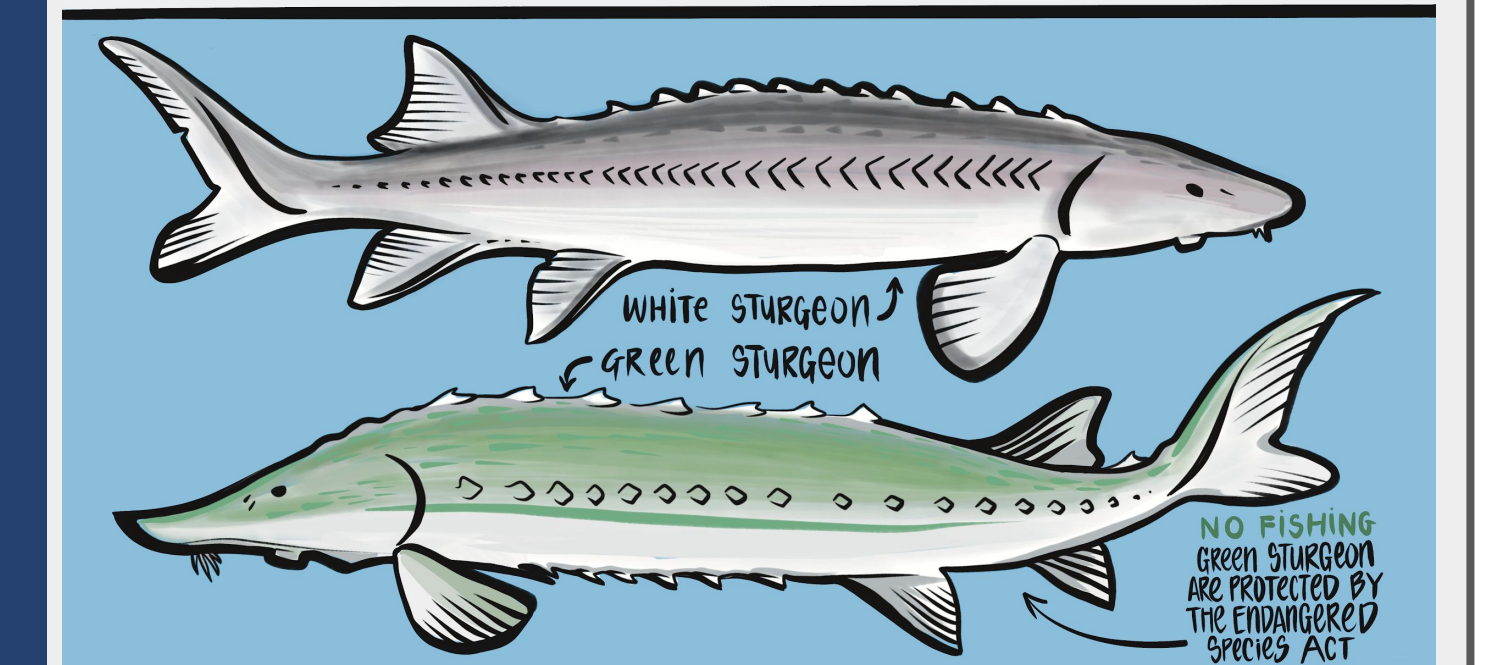
## Passage

- Passage corridors should be wide enough for large sturgeon to make a complete directional change (in general, the larger the width, the better).
- Nature-like swimways with constant gentle gradients/slopes are preferred.
- Unlike salmonids, sturgeon are unable to jump between pools and turning pools are not recommended.
- Avoid narrow areas and shallow depth (deeper, wider areas are required as the length of passage distance increases).
- Large resting pools should be placed between baffled sections and any baffle should be designed for the burst swimming speed for sturgeon.
- Sturgeon cannot navigate large drops or 90 degree turns.
- Avoid submerged impediments or orifices.
- Open channels are preferred with limited use of tunnels and pressurized flows.
- At higher velocities, sturgeon can only travel short distances.
- At lower velocities, sturgeon are not motivated (typically under 2 feet per second).
- Gradual velocity transitions are best, and sturgeon cannot navigate an approach velocity straight on.
- Site specific considerations must be taken into account.



### PROTECT CALIFORNIA STURGEON

Report Dead Sturgeon: [CASturgeonResearch@noaa.gov](mailto:CASturgeonResearch@noaa.gov)



TAKE ACTION