

# Status of Sturgeon in the Kennebec River



Kenneth Edgecomb at his commercial sturgeon fishing operation on Sturgeon Island, Merrymeeting Bay circa 1900. Bath Times Photo

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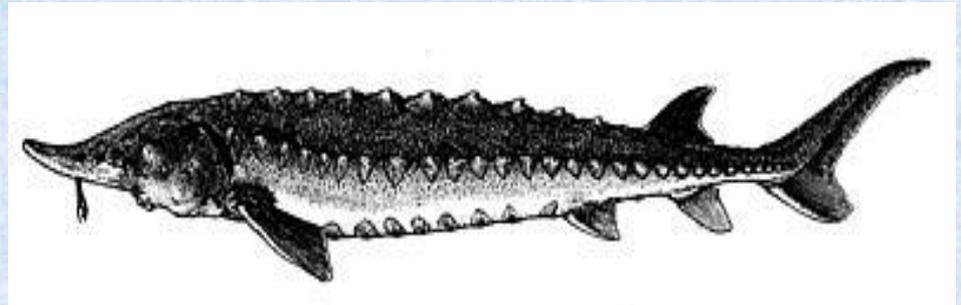
# Atlantic Sturgeon

## *Acipenser oxyrinchus*

**1:** Atlantic Sturgeon are anadromous. They spend most of their life cycle in the marine environment but spawn in freshwater.

**2:** Adults enter the rivers from May through July to spawn, Females are usually over 20 years old and over 6.5 feet in length and males over 12 years old and over 5 feet in length. The spawning interval for males is 1-5 years and 2-5 years for females

**3.** They spawn in flowing waters at water temperatures ranging from 55-68 °F and require solid substrate for the eggs, which are adhesive. Temperatures in the Kennebec River during spawning in recent studies ranged from 64 to 77 °F.



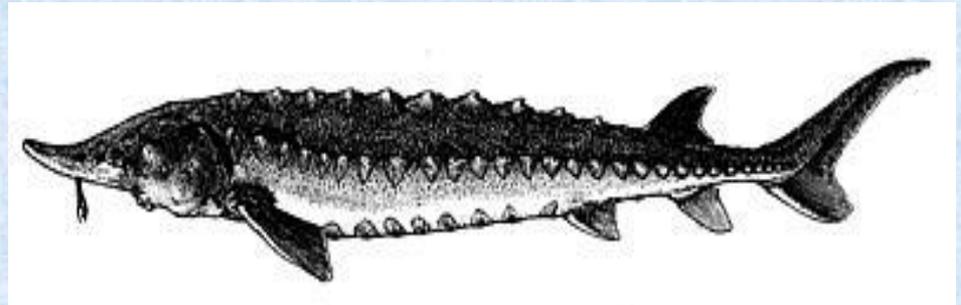
# Atlantic Sturgeon

*Acipenser oxyrinchus*

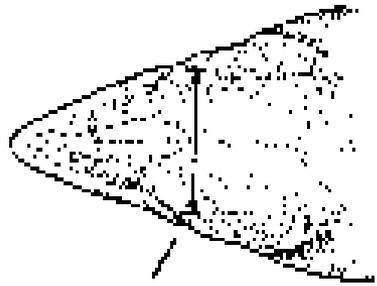
**4:** After egg deposition, hatching occurs in approximately from 4 to 6 days depending on temperature. They are initially photonegative and seek cover. 5-7 days after hatching they begin swim-up and drift with current. They absorb the yolk sac and begin feeding.

**5:** Juveniles remain in their natal river system for 2-6 years and 30 to 36 inches in length.

6. Subadult Atlantic sturgeon wander among coastal and estuarine habitats, undergoing rapid growth



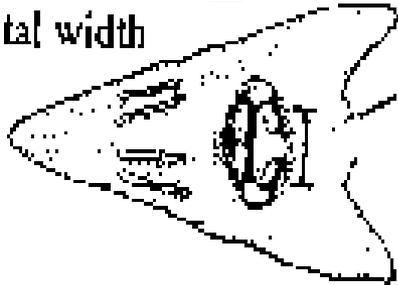
# ATLANTIC



Interorbital width

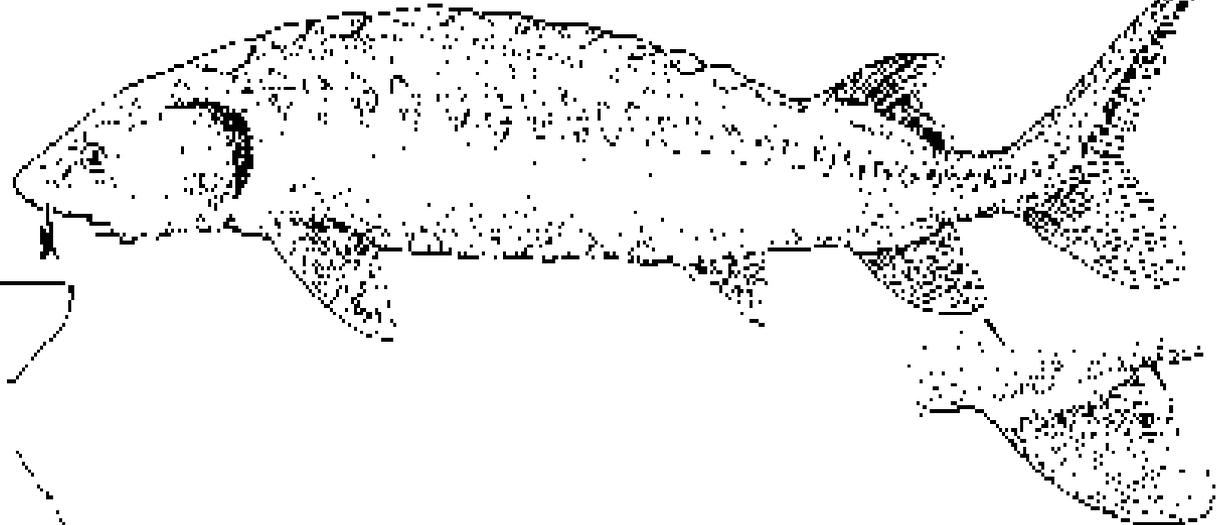
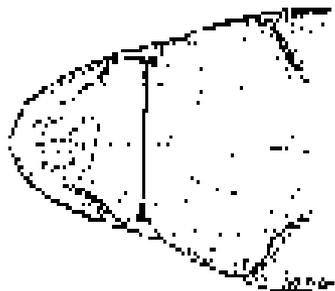


Mouth width



Body plates

# SHORTNOSE

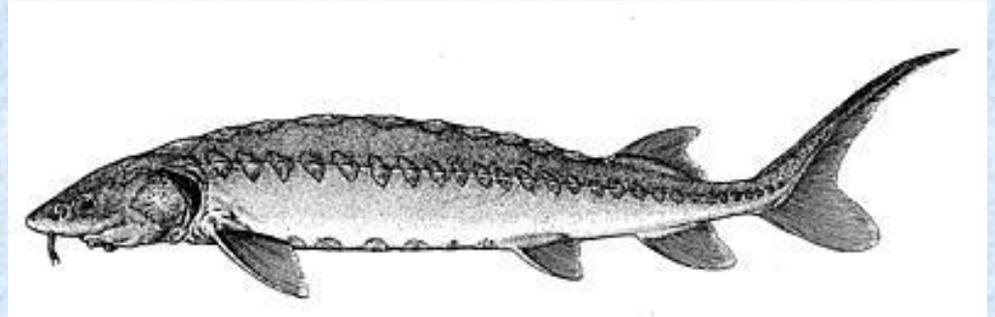


# Shortnose Sturgeon

*Acipenser brevirostrum*

**1:** Shortnose Sturgeon are amphidromous. They spend most of their life cycle in the riverine environment.

**2:** Adults migrate to spawning area from late April through early June to spawn, Females are usually over 12 years old and range from 30 to 40 inches in length and males over 8 years old and 30 to 36 inches in length. The spawning interval for males is 1-5 years and 2-5 years for females **3.** They spawn in flowing waters at water temperatures ranging from 46-65 °F and require solid substrate for the eggs, which are adhesive.

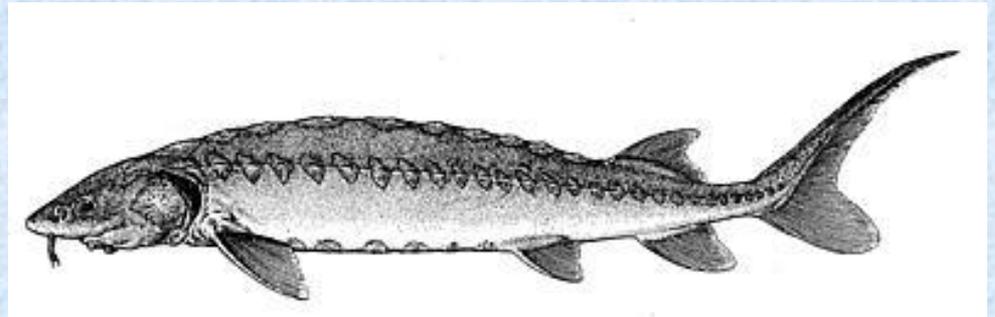


# *Shortnose Sturgeon*

## *Acipenser brevirostrum*

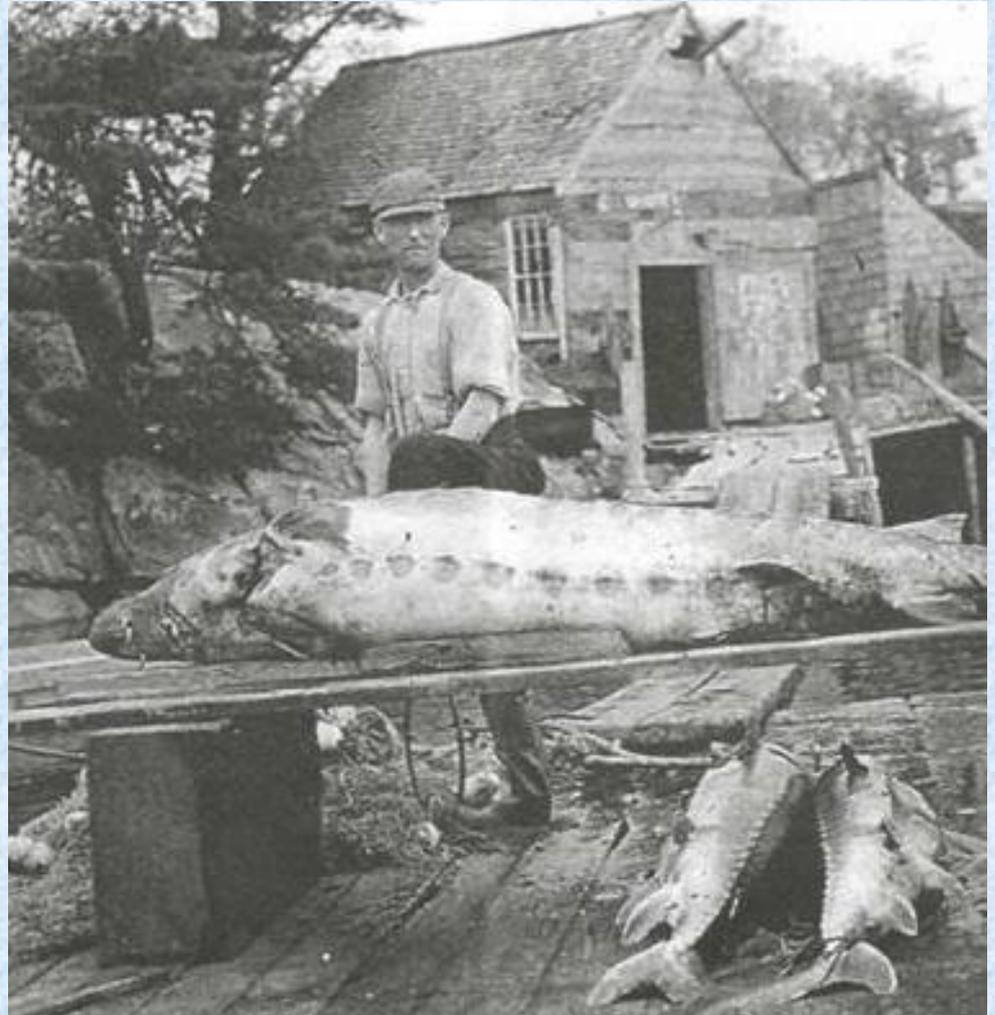
**3:** Hatchlings are photonegative and seek cover in substrate. Larvae 9-16 days old are photopostive and drift downstream. Larvae most active at night. Prefer deep channels( Richmond and Kynard, 1995).

**4:** Juveniles (<45 cm) remain in freshwater, feeding on insects and small crustaceans (Dadswell, 1979). Very little is known about the location and habitat of juveniles in the Kennebec River system.



# Historical Sturgeon Fishery

The first documented fishery was in 1628 at Pejepscot Falls on the Androscoggin River (Wheeler and Wheeler 1878), and by the early 1700s the sturgeon fishery in the Province of Maine employed more than 20 vessels in some years. In 1849, harvesters took 160 tons of sturgeon from the Kennebec River for roe and oil, but the fishery was discontinued after 1851 when sturgeon became scarce. A subsequent fishery in the Kennebec began in 1872, but within five years sturgeon were scarce, and by 1880 the catch was about 150 sturgeon (Atkins 1887).



Kenneth Edgecomb at his commercial sturgeon fishing operation on Sturgeon Island, Merrymeeting Bay circa 1900. Bath Times Photo

# Historical Sturgeon Fishery

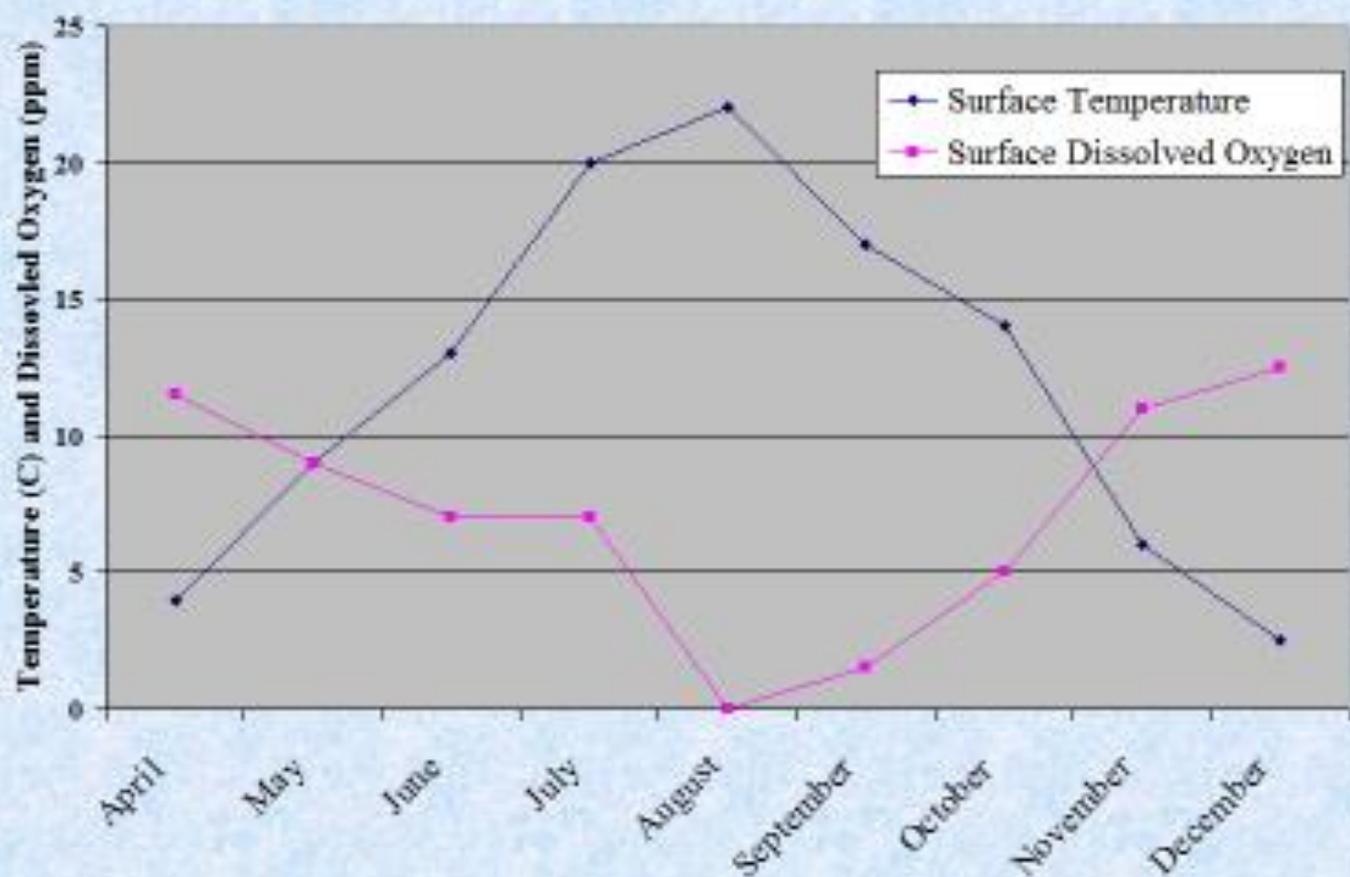
A small commercial fishery on the Kennebec River in South Gardiner occurred near Rolling Dam from June 15 – July 26, 1980. Thirty-one adult Atlantic sturgeon (27 males, 4 of which were ripe and 4 females, 1 of which was ripe) were captured. Two adults tagged in 1978 by the MEDMR in South Gardiner were recaptured in this fishery.

In 1983, Maine closed the tidal waters of the Kennebec and Androscoggin to harvest of sturgeon, and instituted a 72-inch minimum size for other areas. In 1992, the harvest of sturgeon (both species) became illegal in Maine's coastal waters.

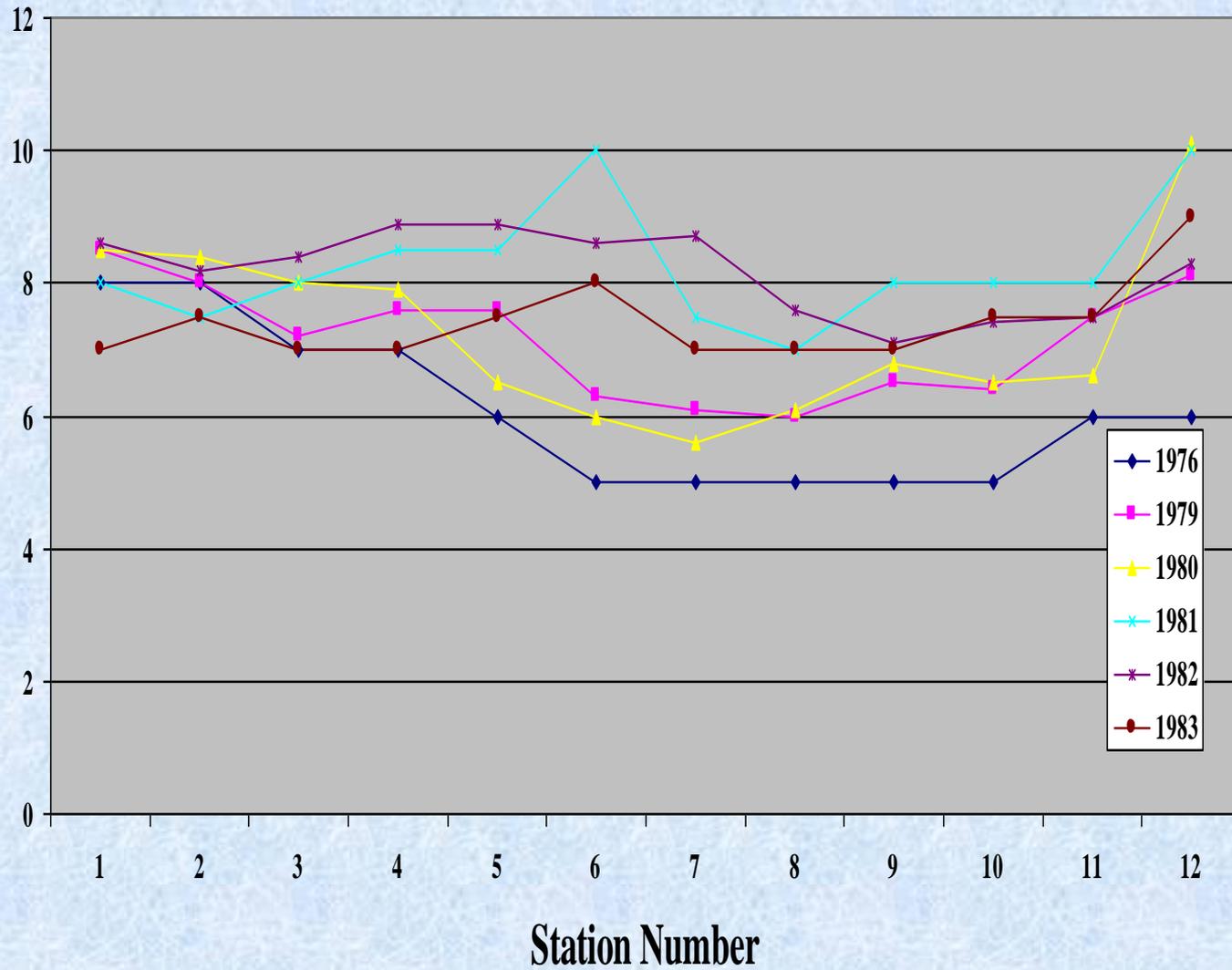


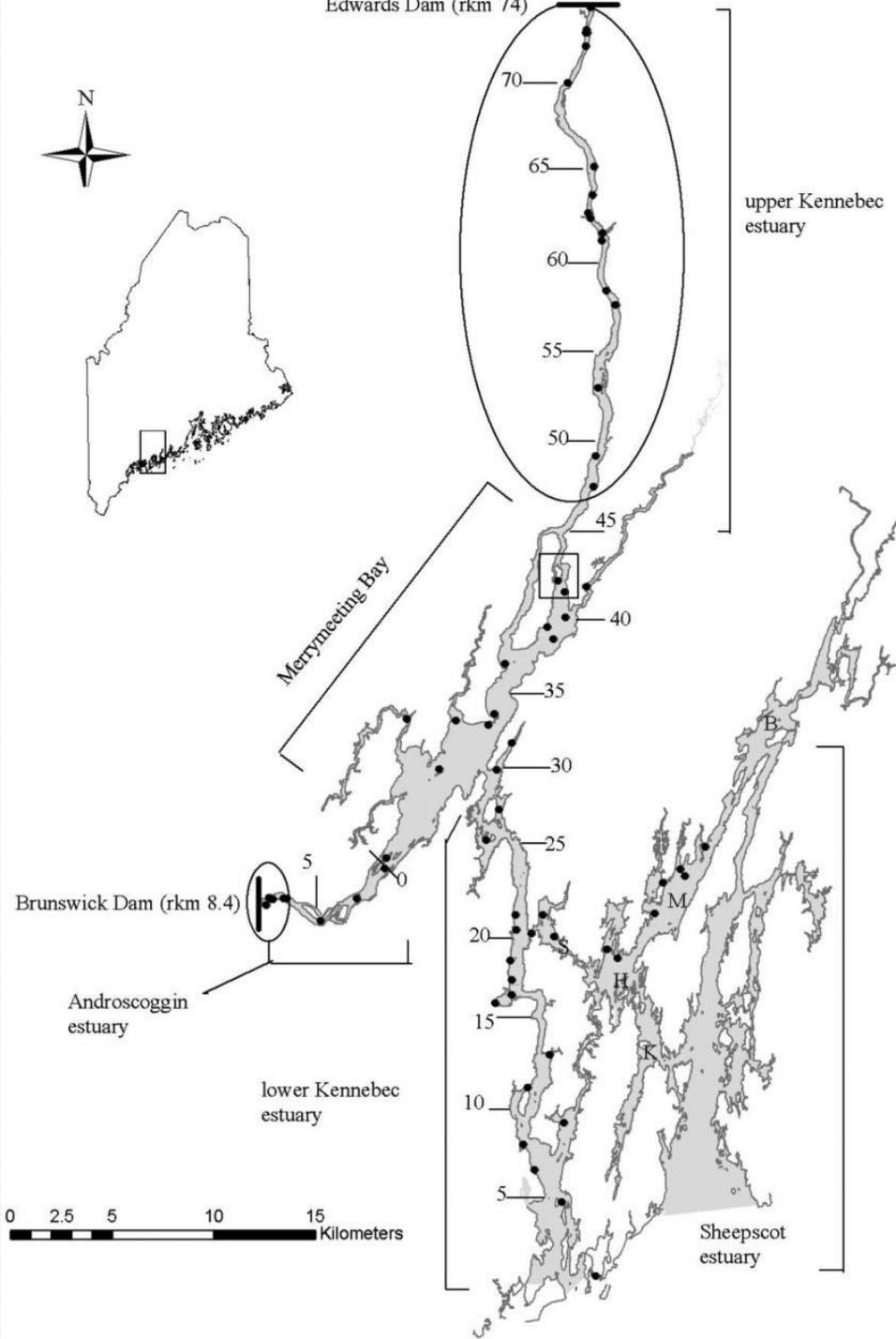
# Major Improvement In Water Quality In Mid-1970's

## Dissolved Oxygen\_Richmond Bridge\_1970

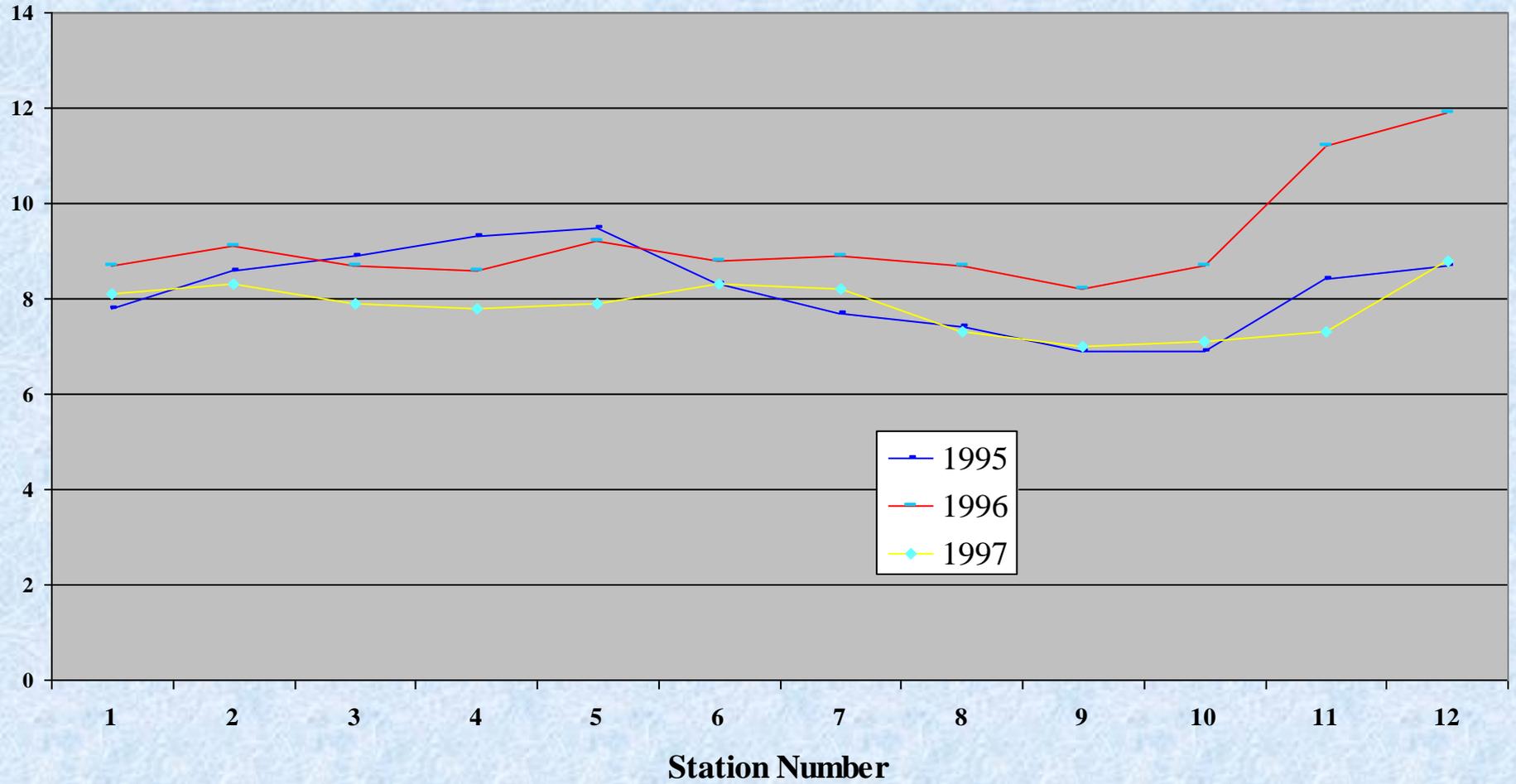


# Dissolved Oxygen Levels-Kennebec River

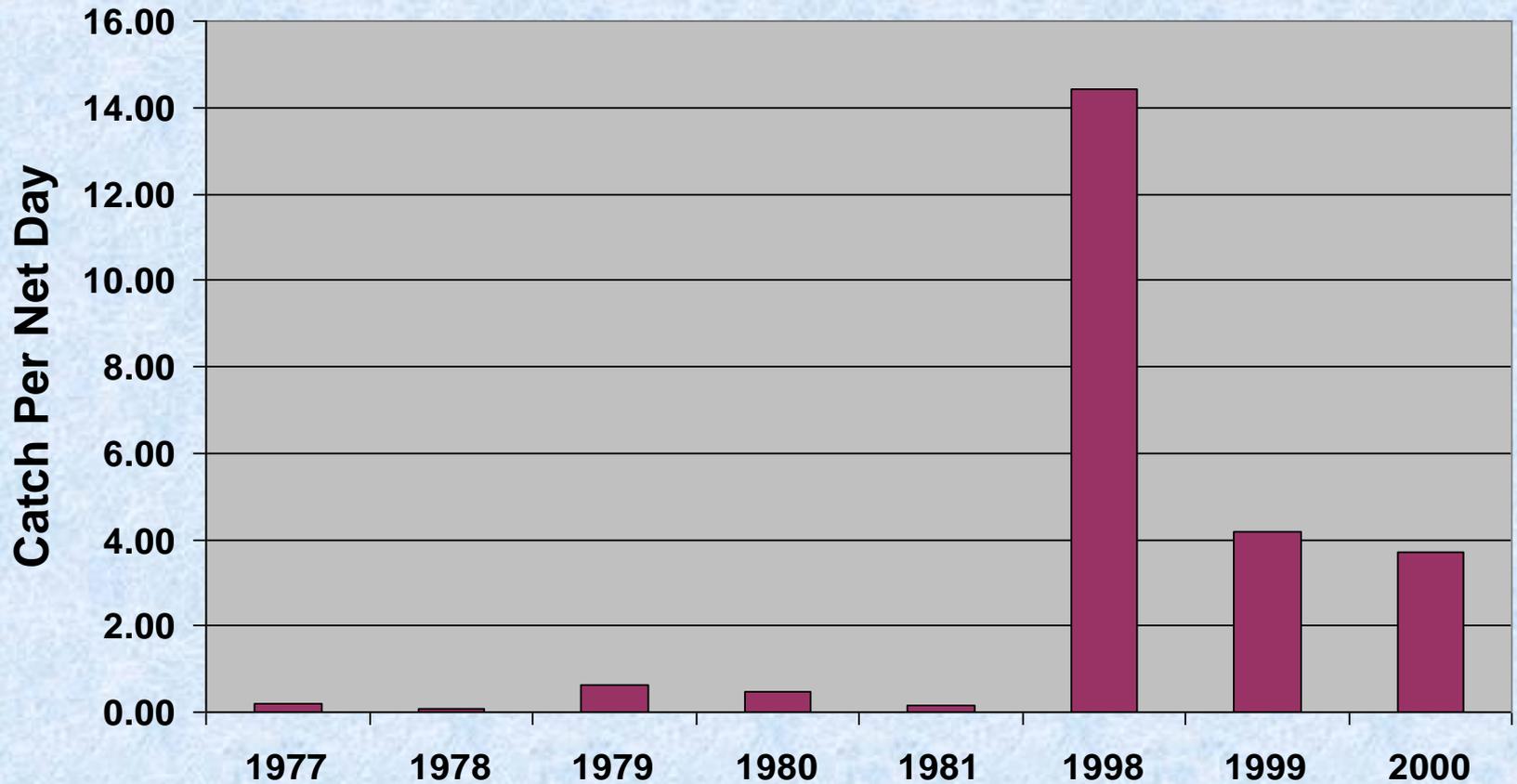




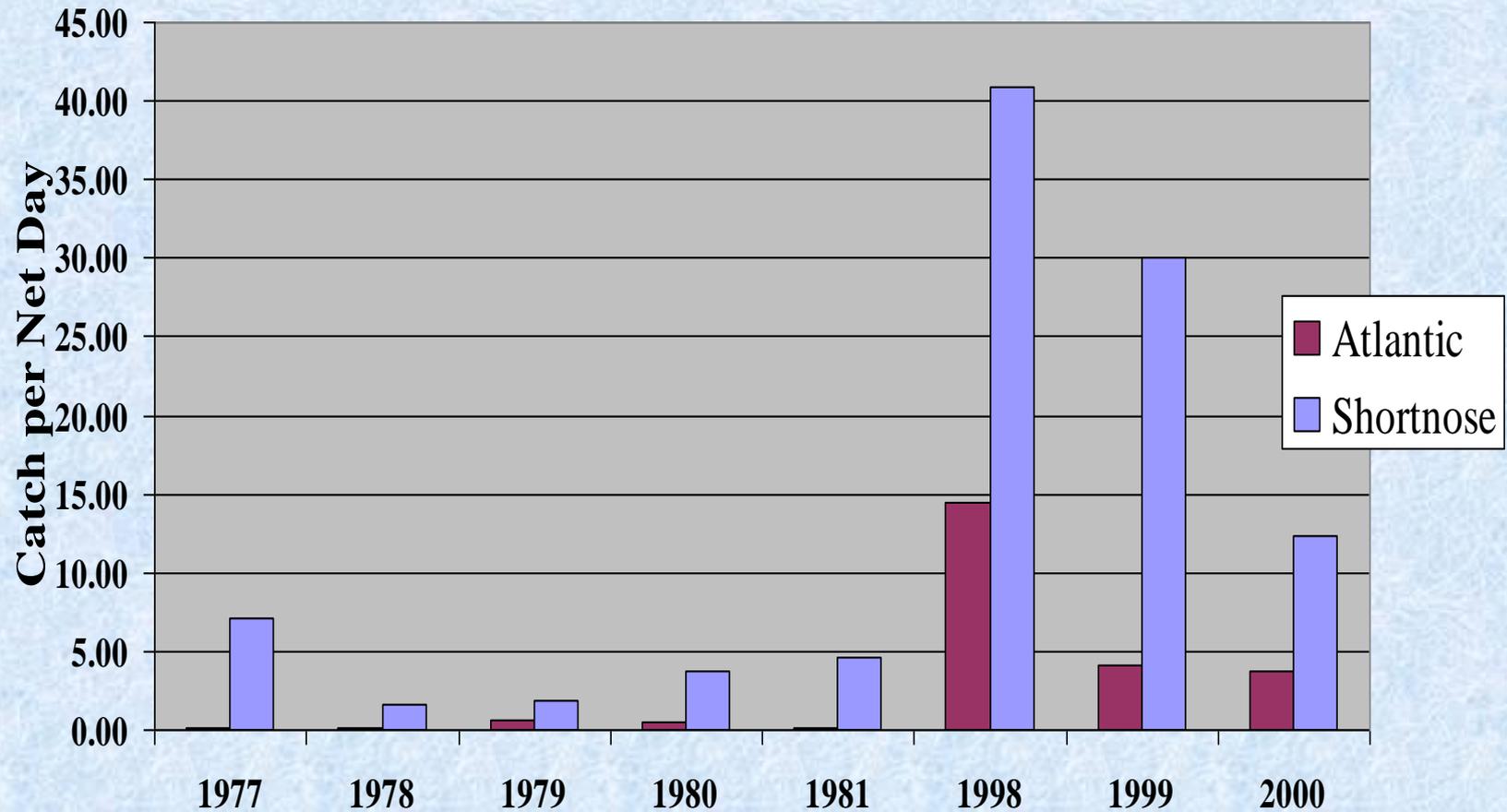
# Dissolved Oxygen Levels-Kennebec River



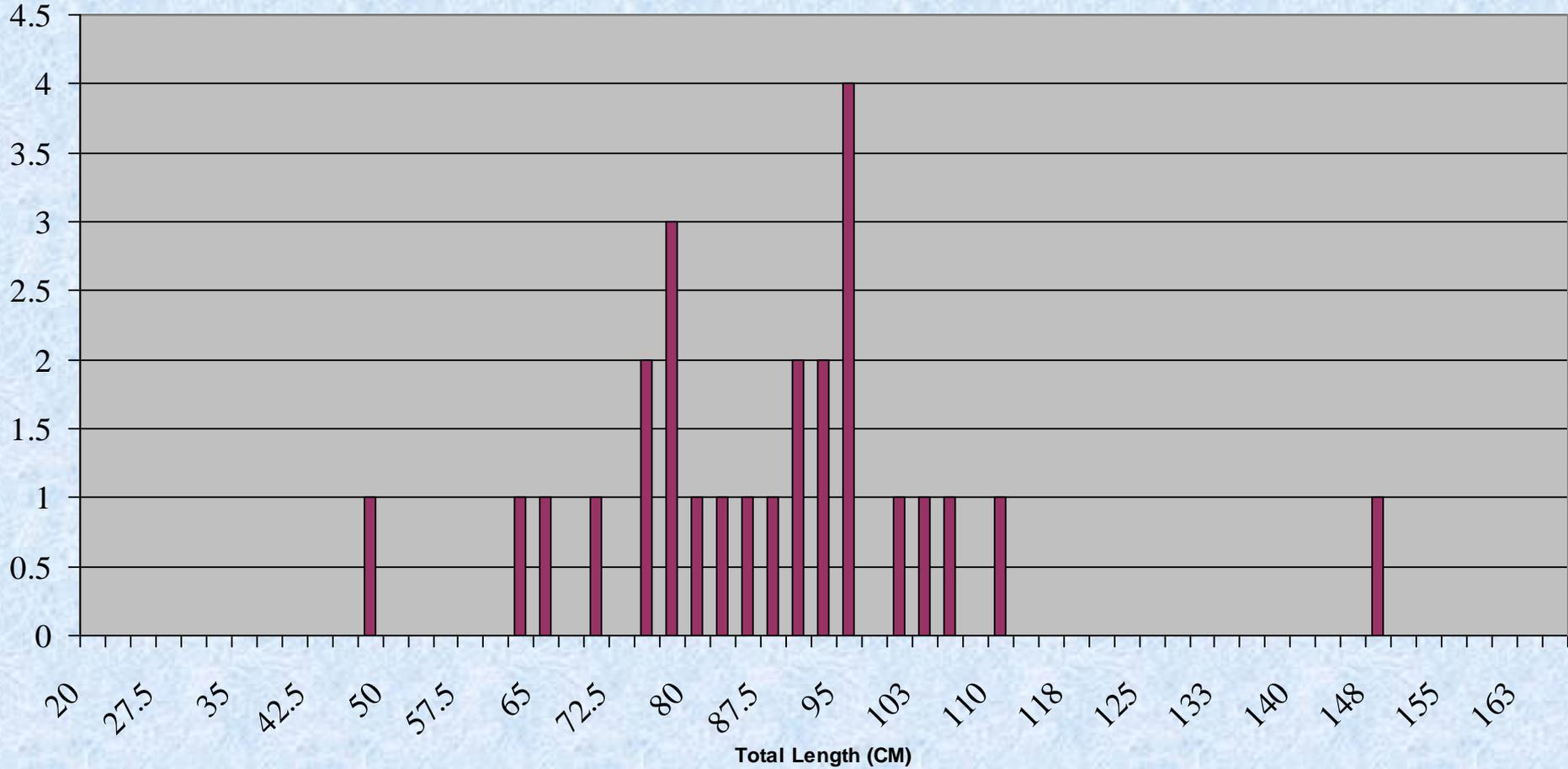
# Catch Of Sub-Adult Atlantic Sturgeon Per Net Day



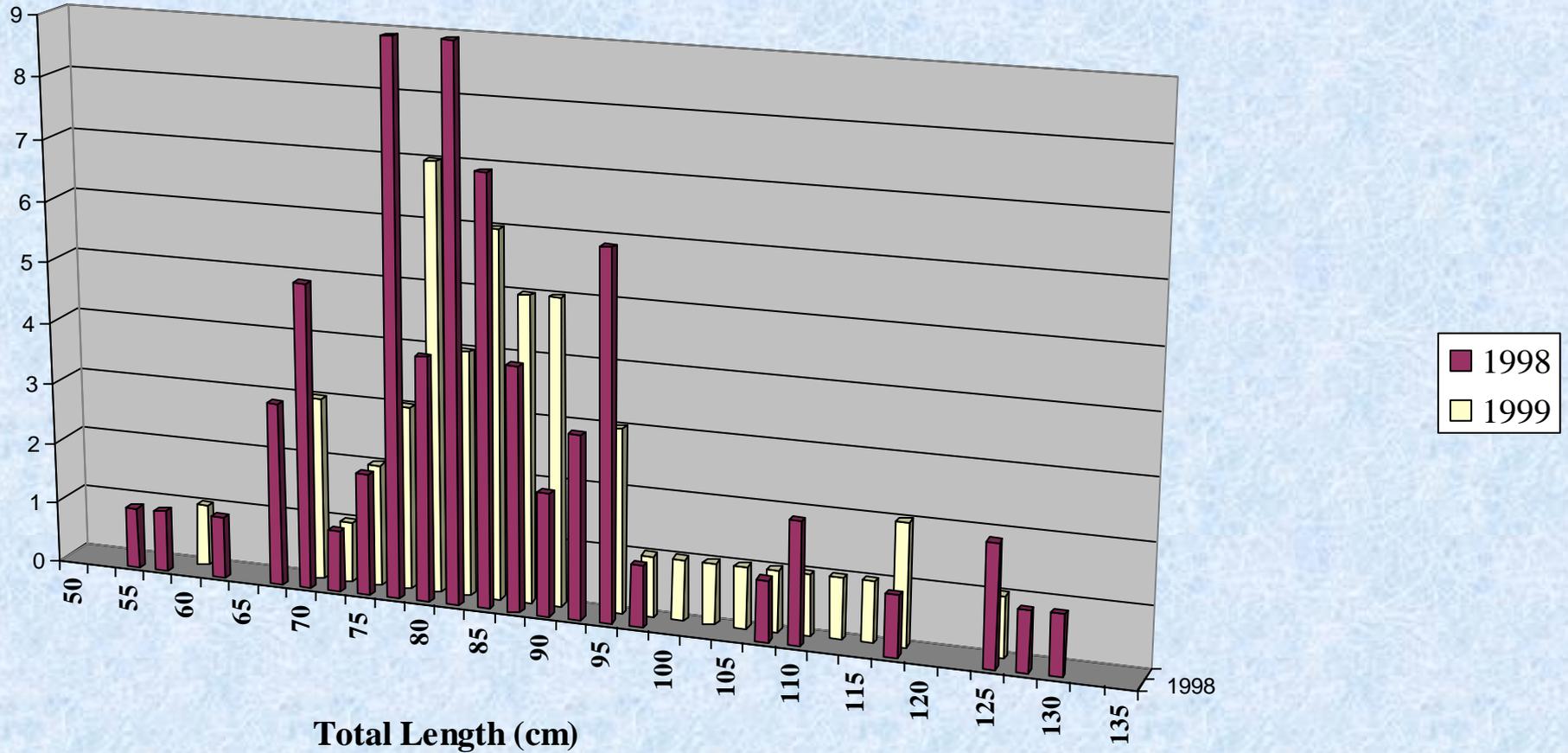
# Catch Of Sub-Adult Atlantic Sturgeon Versus Adult Shortnose Sturgeon



# Length Frequency For Atlantic Sturgeon Captured In 1979

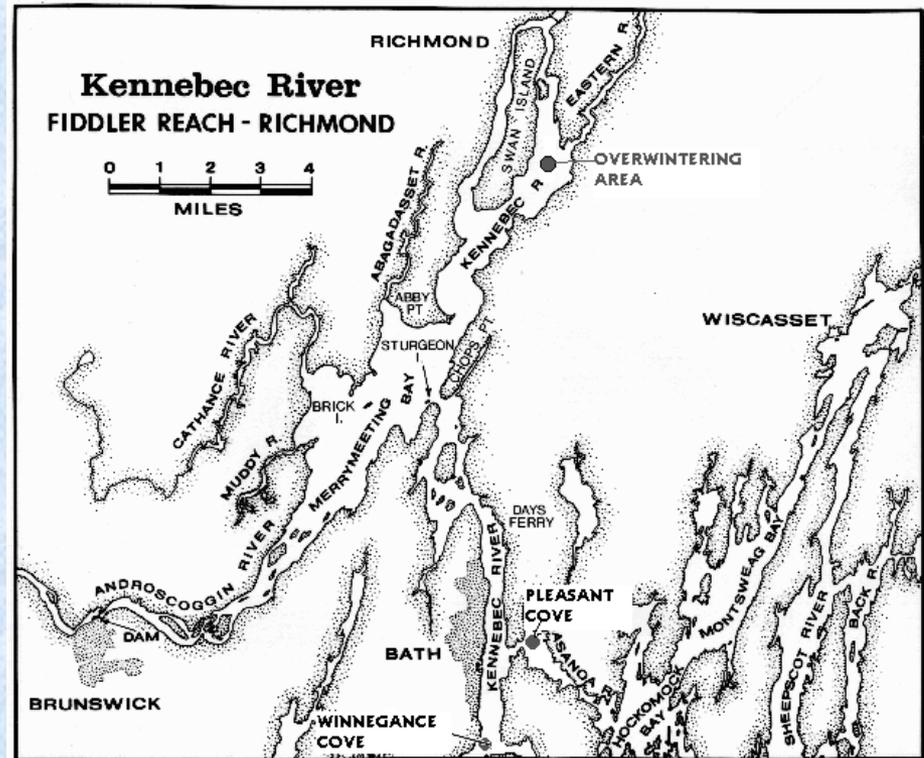


# Length Frequencies For Atlantic Sturgeon Captured in 1998 and 1999



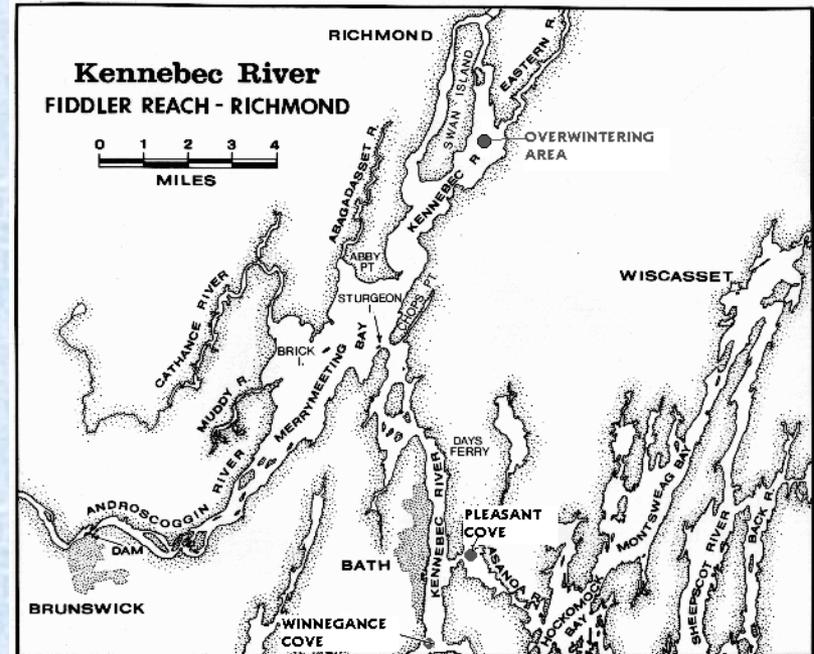
# Kennebec, Androscoggin, and Sheepscot Rivers

- Shortnose Sturgeon first discovered in Sheepscot River by UMO in 1971
- MDMR initiated population study in Kennebec, Androscoggin, Sheepscot Rivers in 1977



# Kennebec, Androscoggin, and Sheepscot Rivers

- 1977-1981-MDMR identified seasonal movement patterns, located spawning areas, and estimated population size
- Schnabel estimate of 7,222 adults (5,046 to 10,7650)



# Kennebec, Androscoggin, and Sheepscot Rivers

- 1993 Study to delineate exact location of spawning site (s) in the Androscoggin River
- Catch per unit of effort higher than found in 1977-1981 study



# 1993 Androscoggin River Spawning Habitat Study



# Kennebec, Androscoggin, and Sheepscot Rivers

- 1996 Status Review of shortnose sturgeon in the Androscoggin and Kennebec Rivers performed by NMFS in response to petition to delist
- Concluded the populations were still endangered

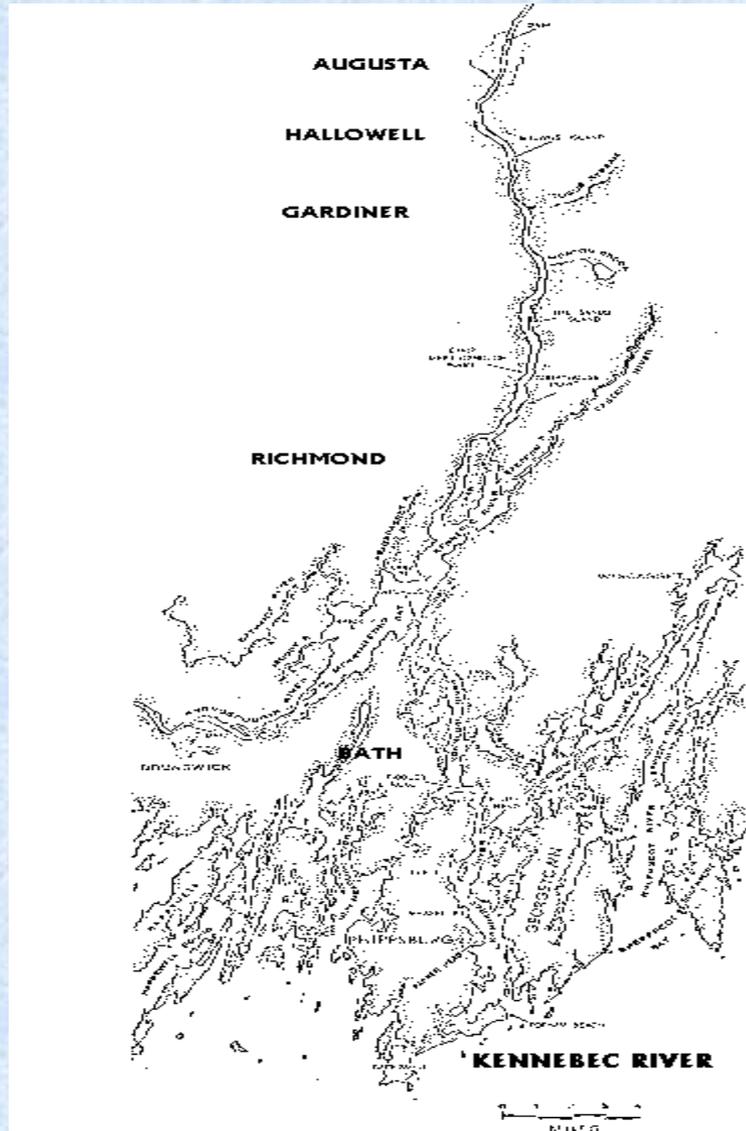


# Kennebec, Androscoggin, and Sheepscot Rivers

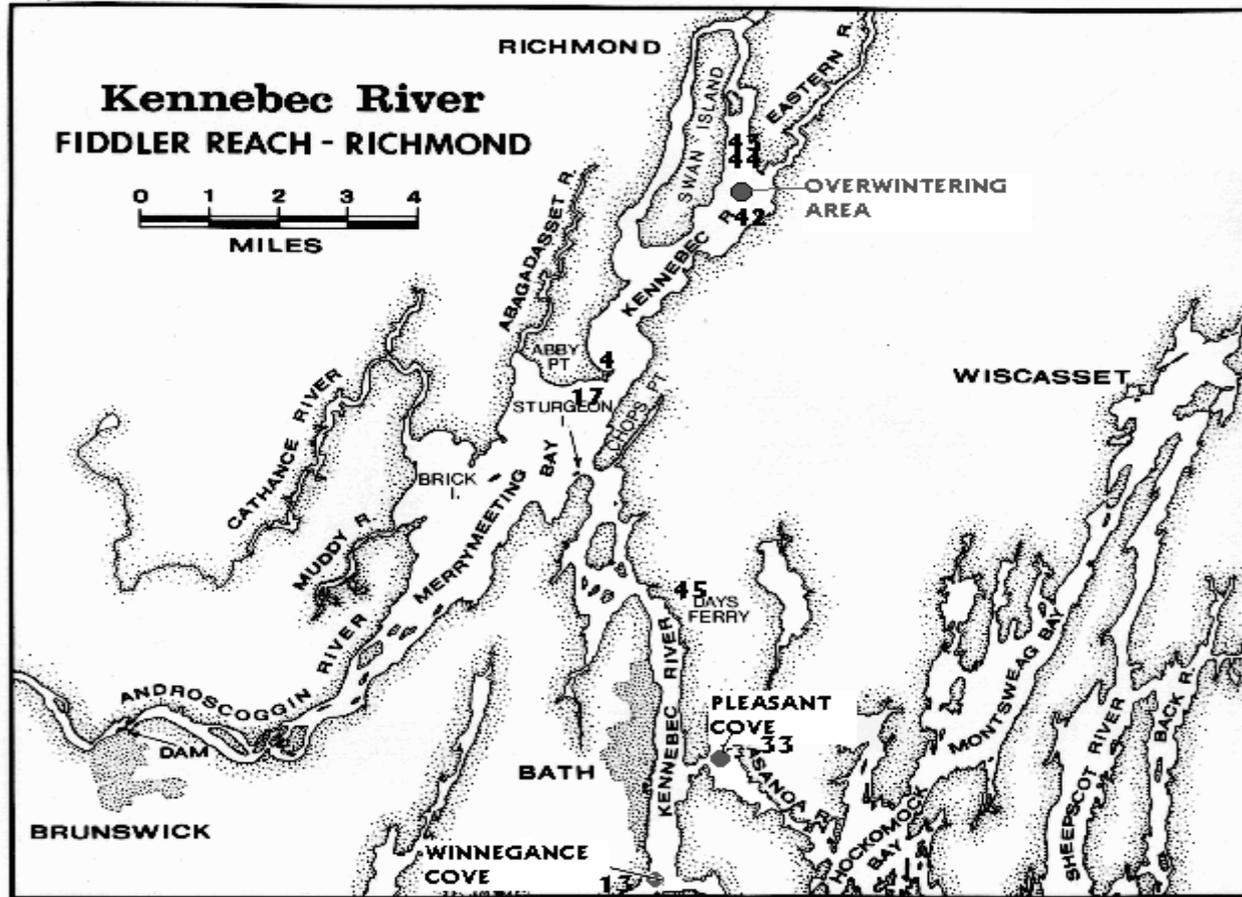
- 1996 Status Review
- Questioned whether there might be two distinct population segments in the Kennebec and Androscoggin Rivers



# 1995-1996 Overwintering Study



# 1995-1996 Overwintering Study

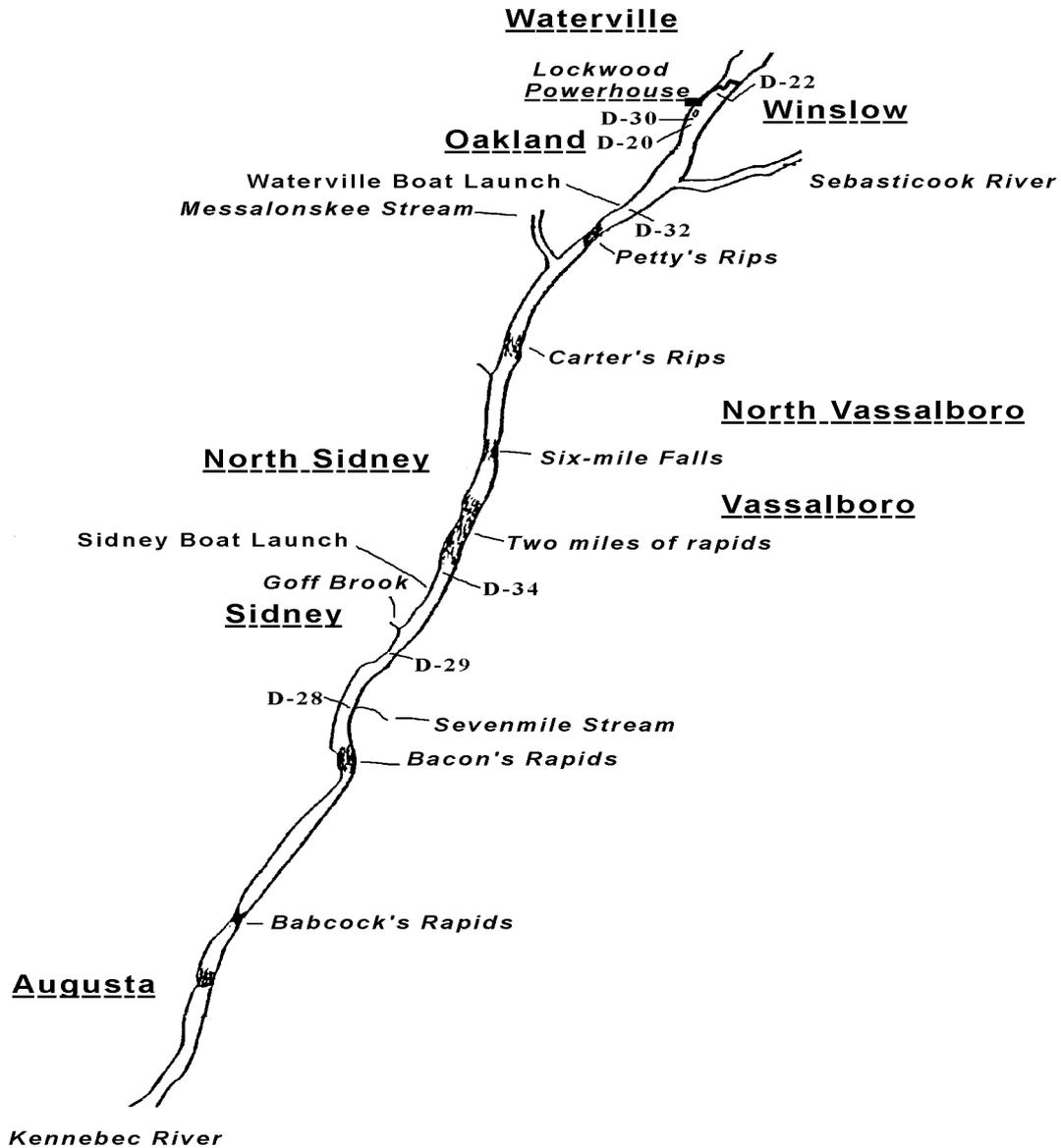


# Habitat Restoration. Edwards Dam Removal 1999.



# Access to 17 miles of riverine habitat restored-Kennebec River 1999





# 1998-2000 Population Estimate



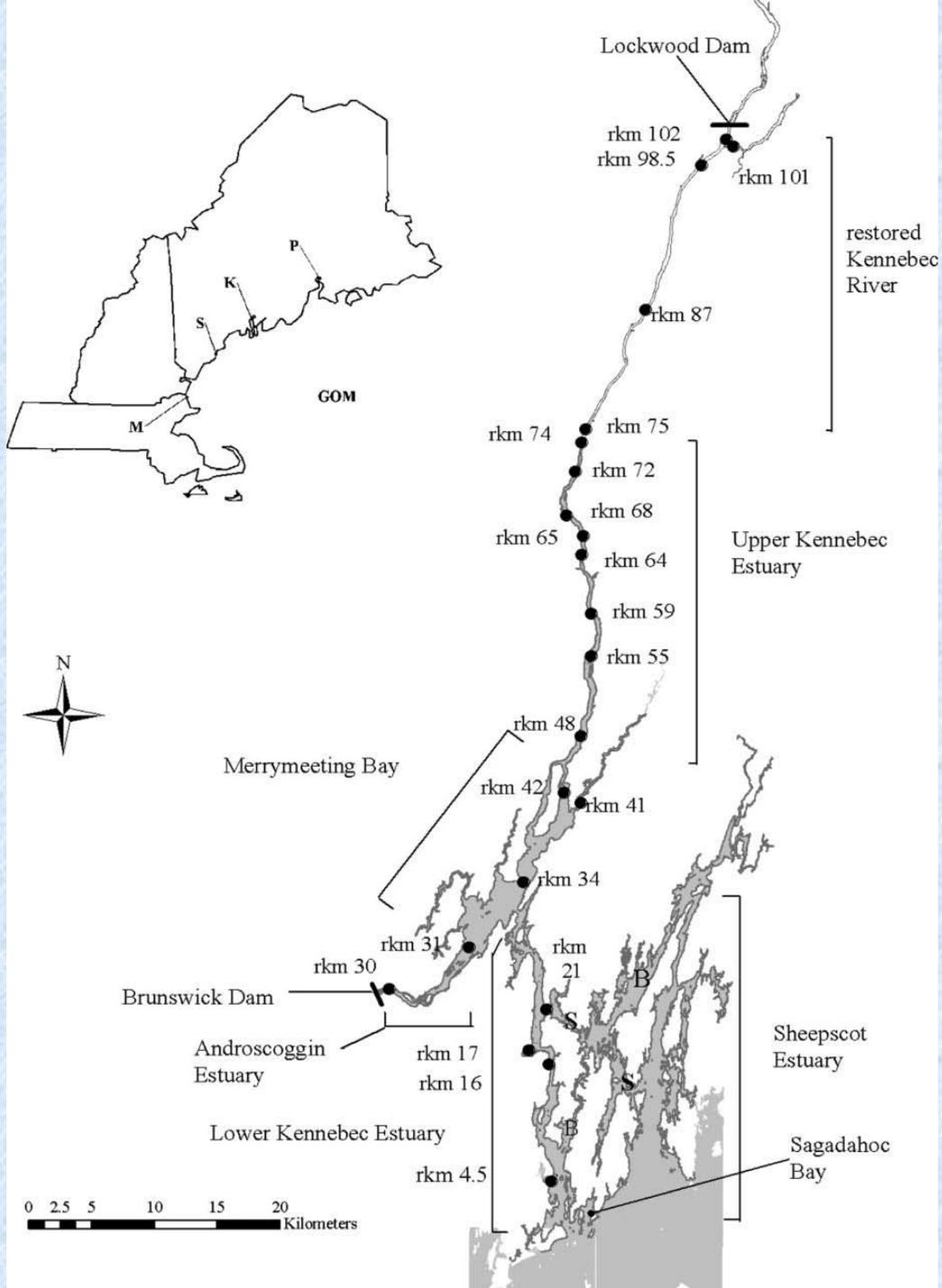
# 1998-2000 Population Estimate

- Population estimate of 9,436 with a 95% confidence interval of 7,542 to 11,888. The population estimate made for the time period 1977 through 1981 was 5,177 with a confidence interval of 4,206 to 6,279



First sturgeon captured above the  
former Edwards Dam. Base of  
Lockwood Dam in Waterville on  
May 12, 2003





# Penobscot River

- One shortnose sturgeon was captured in the Penobscot River estuary on June 30, 1978.
- A directed survey for spawning shortnose sturgeon was conducted in 1994 and 1995 in the upper tidal reaches.
- No shortnose sturgeon were captured in 409 net hours of gill net effort

## Most Recent Studies: Use of Kennebec River by Gulf of Maine Shortnose Sturgeon

- Mature female shortnose sturgeon outfitted with acoustic transmitters in the Penobscot and Merrimack Rivers spawning in the Kennebec River complex. Spawning in the Androscoggin, upper estuary of the Kennebec River and in the recently restored section of the Kennebec River from Augusta to Waterville.

## Most Recent Studies: Use of Kennebec River by Gulf of Maine Shortnose Sturgeon

- Mature female shortnose either migrate in late fall from Merrimack and Penobscot and overwinter in Kennebec River before spawning in spring or directly migrate in spring from overwintering areas in the Merrimack and Penobscot Rivers to spawning areas in the Kennebec River system.

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# The End.

- Final pictures from a video clip taken by Douglass Watts.





