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**NATIONAL MARINE FISHERIES SERVICE**
**ENDANGERED SPECIES ACT**
**BIOLOGICAL OPINION**

**Agency:** U.S. Army Corps of Engineers – New England District

**Activity Considered:** Emergency Dredging of Federal Navigation Channel, Kennebec River, Maine
**F/NER/2003/01461**

**Conducted by:** National Marine Fisheries Service
Northeast Region

**Date Issued:** JAN 13, 2004

**Approved by:**

This constitutes the National Marine Fisheries Service's (NOAA Fisheries) biological opinion based on our review of the dredging of the federal navigation channel in the Kennebec River, Maine, and the emergency consultation on the effects of that action on threatened and endangered species in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). This biological opinion (BO) is based on information provided in the NOAA Fisheries August 28, 1997 BO on dredging in the Kennebec River Federal Navigation Channel, the November 29, 2000 amendment to the 1997 BO, the April 16, 2002 BO on the dredging of the Kennebec River Federal Navigational Channel, correspondence with Mr. William Kavanaugh of the ACOE, and other sources of information. A complete administrative record of this consultation will be kept at the NOAA Fisheries Northeast Regional Office. Formal consultation was initiated on November 21, 2003.

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## CONSULTATION HISTORY

The Kennebec River Federal Navigation Channel has been dredged since 1950 at approximately three-year intervals. Informal consultations were conducted in 1989 and again in 1991 to evaluate the potential impacts to shortnose sturgeon (*Acipenser brevirostrum*) known to inhabit the Kennebec River system. Based on limited knowledge of shortnose sturgeon distribution at the time, it was concluded that as long as the work at the upper river site (Doubling Point), using the disposal site at the area north of Bluff's Head, was conducted from September 15 to October 15 and from March 1 through April 30, and work at the lower river site off Popham Beach was conducted from November 1 through the end of April 30, no impacts to migrating, spawning, feeding, or overwintering shortnose sturgeon were expected.

However, since 1991, information on shortnose sturgeon distribution obtained by Maine Department of Marine Resources (DMR) biologists began to suggest that shortnose sturgeon might be using the area near the disposal site at Bluff's Head as an overwintering site. In addition, it was logistically difficult to complete the necessary dredging during those narrow windows. Consequently, as maintenance dredging was again being planned for 1996-1997, the ACOE reinitiated consultation in February of 1996 and prepared a biological assessment (BA) on potential impacts to shortnose sturgeon from the proposed dredging. During this time period, a

study on shortnose sturgeon use of the Kennebec River was in progress, funded by the Department of Transportation (DOT) for the Carlton Bridge Replacement Project. The purpose of the study was to radio tag shortnose sturgeon for determination of overwintering site locations in the estuarial complex of the Kennebec River during the winter of 1996/1997 (Squires and Robillard 1997). The BA was completed in April of 1997 after the results of the first two years of this study were summarized (ACOE 1997). Based on the available data, on August 28, 1997, NOAA Fisheries completed the BO and determined that maintenance dredging of the Kennebec River Federal Navigation Channel between November 1 and April 30 may affect but was not likely to jeopardize the continued existence of shortnose sturgeon. Dredging outside of this window was not considered in this BO.

In a letter dated February 9, 2000, the ACOE informed NOAA Fisheries that shoaling was occurring in the Doubling Point and Popham Beach reaches and requested clarification on the existing Incidental Take Statement (ITS) and whether the ITS was cumulative over the life of the BO or if it applied to each dredging event. ACOE also informed NOAA Fisheries, at this time, that they were seeking a long-term Water Quality Certification and Coastal Zone Management Consistency Concurrence from the State of Maine. Fisheries sampling conducted from April 1997 through June 1998 by Normandeau Associates collected several shortnose sturgeon during the dredge window (on November 3 and November 17, 1997, and April 1 and April 23, 1998). No fish were caught from December 3, 1997 to March 4, 1998 in any sampling location. A tracking study also performed by Normandeau Associates in 1999, documented a number of tagged shortnose sturgeon throughout the Bath area during March, April, and November. This new tracking data indicated that shortnose sturgeon are likely to be present in the project area during the window specified in the BO. Therefore, NOAA Fisheries determined that the 1997 BO's seasonal restrictions on dredging did not ensure the protection of shortnose sturgeon as originally anticipated. NOAA Fisheries responded to the February 9, 2000 correspondence from ACOE on March 17, 2000 and informed them that reinitiation of the 1997 consultation was potentially warranted due to new information on the presence of shortnose sturgeon in the project area and to clarify the ITS, the project length, and dredging frequency. NOAA Fisheries also stated that in order to reinitiate section 7 consultation that ACOE should provide clarification of the long-term time frame for the Water Quality Certification and Coastal Zone Management Consistency Concurrence and provide information on the project time period and dredging frequency.

In a letter dated November 29, 2000, NOAA Fisheries informed ACOE that the 1997 BO needed to be revisited to adequately consider the tracking data from 1998 and 1999 (i.e., shortnose sturgeon have a high probability, rather than an unlikely possibility, of occurring in the project area during March, April, and November). NOAA Fisheries determined, at that time, that it was feasible to issue an amendment to the 1997 BO to modify the time of year restriction, and that the issuance of an entirely new BO was not warranted, as the effects of the action on shortnose sturgeon described in the existing BO still pertained to the project. This determination was contingent on the condition that the maintenance dredging would be conducted from December 1 to March 1 (when shortnose sturgeon were not likely to be present in the project area). It was NOAA Fisheries' opinion that maintenance dredging of the Kennebec River Federal Navigation

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Channel from December 1 to March 1 may affect but was not likely to jeopardize the continued existence of shortnose sturgeon and therefore, was consistent with the effects analysis conducted in the 1997 BO. The November 29, 2000 letter served as the amendment to the BO and stated that any future maintenance dredging activities in the Kennebec River Federal Navigation Channel would be subject to these conditions. Dredging was completed in December 2000.

NOAA Fisheries' November 29, 2000 letter stated that if dredging outside the established window would be necessary, consultation would need to be reinitiated by the ACOE in order to assess the effects of the action on shortnose sturgeon. Due to the unpredictable nature of shoaling in the Kennebec River, the ACOE expressed concerns about being restricted to perform maintenance dredging during the December to March time period. The effects of the action section in the 1997 BO evaluated the project's impacts on shortnose sturgeon with the interpretation that the species was not likely to be common in the project area from November to April. Since new information indicated that the likelihood of shortnose sturgeon presence in the action area was more likely than previously thought, the effects of the maintenance dredging project on sturgeon would need to be reconsidered if the ACOE decided to dredge outside of the December to March time period.

On January 30, 2002, the ACOE informed NOAA Fisheries that dredging at Doubling Point and Popham Beach in the Kennebec River Federal Navigation Channel would need to be conducted in April, 2002. Hydrographic surveys at Doubling Point to the Carlton Bridge in Bath and at the mouth of the river near Popham Beach indicated that the Doubling Point reach has shoaled to 21.6 feet below MLW and the Popham Beach area has shoaled to 18.2 feet below MLW along the north limit of the channel. The authorized channel depth is 27 feet below mean low water. Based on these depths, the Bath Iron Works (BIW) expressed concern to the ACOE that Navy Destroyers cannot safely transit the channel even during extreme high tides. On March 5, 2002, the ACOE requested that formal consultation with NOAA Fisheries be reinitiated in order to assess the effects of dredging in the Kennebec River Federal Navigation Channel in April and November on shortnose sturgeon.

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In a BO dated April 16, 2002, the effects of maintenance dredging of the Federal Navigation Channel at Doubling Point and Popham Beach on shortnose sturgeon were assessed for the November 1 – April 30 time frame. Accompanying this BO was an ITS which authorized the annual incidental taking of 4 shortnose sturgeon at Doubling Point during any year. Maintenance dredging of these reaches was performed in April 2002. No incidental takes were observed during that dredge cycle.

As indicated above, maintenance dredging in the Doubling Point area was last performed in April 2002. Based on the historic shoaling rate, dredging was not expected to be required for one to three years. However, in a letter dated September 19, 2003, the ACOE requested an emergency section 7 consultation pursuant to the ESA for the proposed dredging of the Doubling Point reach of the Kennebec River. The April 2002 BO authorized dredging operations occurring from November 1 – April 30; as dredging was required outside of this time period (i.e., in October) and it was determined that the dredging was likely to affect shortnose sturgeon, a formal

consultation was necessary. Dredging was necessary to remove shoaling that had reached critical levels and would have prevented the safe transit of the USS CHAFEE, a US Navy Destroyer, from BIW on October 10, 2003. The CHAFEE was deemed critical to US Navy fleet operations and national defense and its departure from BIW could not be delayed. A letter from the Captain of the US Navy to the ACOE dated September 12, 2003 outlined the justification for the safety and national security emergency. In a letter dated September 29, 2003, NOAA Fisheries concurred with the request for emergency consultation and provided a list of recommended actions to reduce the likelihood of take and to document any take that occurred. The emergency dredging at Doubling Point began on October 6, 2003 and was completed by October 10, 2003. In a letter dated November 21, 2003, the ACOE submitted a request for initiation of formal consultation to assess the effects of the emergency dredging action. As NOAA Fisheries had all the information necessary to initiate formal consultation, the date of the November 21, 2003 letter serves as the date of initiation of formal consultation.

## DESCRIPTION OF THE PROPOSED ACTION

*Maintenance Dredging*

Maintenance dredging of the Doubling Point area was necessary to allow the safe passage of the USS CHAFEE, a US Navy (USN) Destroyer from BIW. The minimum charted depth of the Kennebec channel in the BIW area is 27 feet. Soundings by BIW and confirmed by the ACOE Survey team in early September discovered a depth of 22 feet at mean low water (MLW) nearest Nun buoy 28. The maximum vessel draft for the CHAFEE is approximately 28 feet 9 inches at the bow, and is achieved by deballasting tanks to produce this draft. Further deballasting of tanks unacceptably reduces the vessel margin of stability and impacts ship maneuverability characteristics, producing an unsafe condition for transiting the vessel in the channel. The range of expected tides did not alleviate the hazardous conditions which likely would have resulted in the grounding of the vessel in the channel. This situation presented a serious safety hazard to the ship and its operating personnel. As indicated in the September 12 letter from Captain Ingram of the USN, failure of the CHAFEE to sail on the required date would have had a critical impact to USN operations and national defense. The impact would have seriously and negatively affected USN operational schedules and would restrict the USN Fleet Commander's ability to surge deployable strike capability as directed by the National Command Authority (NCA). Delay to the ship's schedule would create an unacceptable limitation to the Navy's ability to execute NCA tasking while on a wartime footing.

As stated above, NOAA Fisheries requested that ACOE enforce several conditions to minimize the likelihood of take and to document any take that occurred as a result of the dredging project. These conditions were as follows:

1. During dredging and disposal operations at Doubling Point, a trained NOAA Fisheries-approved observer must be present on board the barge for the duration of the project. Screening or baskets must be placed such that shortnose sturgeon and/or their remains, which travel through the hopper and exit, can be collected and recorded. The ACOE must adhere to the attached "Monitoring Specifications for Hopper Dredges" with trained

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NOAA Fisheries-approved observers, in accordance with the attached "Observer Protocol" and "Observer Criteria" (see Appendix A).

2. Surface, mid-depth, and bottom water temperatures must be recorded during dredging operations, as shortnose sturgeon movements are believed to be correlated with changes in water temperature.

3. If any whole shortnose sturgeon (alive or dead) or sturgeon parts are taken incidental to the project, ACOE must contact Julie Crocker (978)281-9328 ext.6530 or Pat Scida (978)281-9208 within 24 hours of the take. An incident report (attached) must also be completed by the observer and sent to Julie Crocker via Fax (978)281-9394 within 24 hours of the take. Every incidental take (alive or dead) must be photographed and measured, as well as reported.

4. Notify Julie Crocker by phone (978)281-9328 ext.6530 when dredging at Doubling Point begins and ends.

On October 6, 2003, the hopper dredge Padre Island arrived on site and began dredging to clear the most critical shoaling in the Doubling Point reach. Emergency dredging operations continued through, and were completed on October 10, 2003. Approximately 10,000 cubic yards of material were removed from the Doubling Point reach with a hopper dredge. All recommendations were adhered to throughout the duration of the project.

*Disposal of Dredged Material*
Historic sampling and testing has shown that the material is clean sand suitable for in-river or nearshore disposal. Material dredged from the Doubling Point area was placed at the previously used in-river disposal area north of Bluff Head in approximately 95-100 feet of water.

*Action Area*
The action area for this consultation includes the Doubling Point reach of the Kennebec River Federal Navigation Channel in Maine, the in-river disposal site near Bluff Head and the waters between and immediately adjacent to these areas.

## STATUS OF AFFECTED SPECIES

This section will focus on the status of the species within the action area, summarizing information necessary to establish the environmental baseline and to assess the effects of the proposed action.

The only endangered or threatened species under NOAA Fisheries' jurisdiction in the action area is the endangered shortnose sturgeon (*Acipenser brevirostrum*). No critical habitat has been designated for shortnose sturgeon and therefore none will be affected by the proposed action.

### *Shortnose Sturgeon*

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Shortnose sturgeon were listed as endangered on March 11, 1967 (32 FR 4001), and the species remained on the endangered species list with the enactment of the ESA in 1973. A shortnose sturgeon recovery plan was published in December 1998 to promote the conservation and recovery of the species.

Although shortnose sturgeon are listed as endangered range-wide, in the final recovery plan NOAA Fisheries recognized 19 separate populations occurring throughout the range of the species. These populations are in New Brunswick Canada (1); Maine (2); Massachusetts (1); Connecticut (1); New York (1); New Jersey/Delaware (1); Maryland and Virginia (1); North Carolina (1); South Carolina (4); Georgia (4); and Florida (2). Although NOAA Fisheries has not formally recognized distinct population segments (DPS)[1] of shortnose sturgeon under the ESA, based on the most recent reviews of the best scientific and commercial data on shortnose sturgeon and analyses of their population trends, and consistent with the 1998 Recovery Plan, NOAA Fisheries treats the nineteen recognized populations as subpopulations or recovery units whose survival and recovery is critical to the survival and recovery of the species. Any action that appreciably reduced the likelihood that one or more of these populations would survive and recover would appreciably reduce the species' likelihood of survival and recovery in the wild. Although genetic information within and among shortnose sturgeon occurring in different river systems is largely unknown, life history studies indicate that shortnose sturgeon populations from different river systems are substantially reproductively isolated (Kynard 1997) and, therefore, should be considered discrete. While genetic information may reveal that interbreeding does not occur between rivers that drain into a common estuary, at this time, such river systems are considered a single population compromised of breeding subpopulations (NOAA Fisheries 1998). In the recovery plan, NOAA Fisheries stated that loss of a single shortnose sturgeon population may risk the permanent loss of unique genetic information that is critical to the survival and recovery of the species and that; therefore, each shortnose sturgeon population should be managed as a DPS or recovery unit for the purposes of Section 7 of the ESA. Consequently, this BO will treat the nineteen separate populations of shortnose sturgeon as recovery units (one of which occurs in the action area) for the purposes of this analysis.

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Shortnose sturgeon occur in large rivers along the western Atlantic coast from the St. Johns River, Florida (possibly extirpated from this system) to the Saint John River in New Brunswick, Canada. Shortnose sturgeon are large, long lived fish species. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while northern populations are amphidromous (NOAA Fisheries 1998). Population sizes vary across the species' range. From available estimates, the smallest populations occur in the Cape Fear (~8 adults; Moser and Ross 1995) and Merrimack Rivers (~100 adults; M. Kieffer, United States Geological Survey, personal communication), while the largest populations are found in the Saint John (~100,000;

1 The definition of species under the ESA includes any subspecies of fish, wildlife, or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. To be considered a DPS, a population segment must meet two criteria under NOAA Fisheries policy. First, it must be discrete, or separated, from other populations of its species or subspecies. Second, it must be significant, or essential, to the long-term conservation status of its species or subspecies. This formal legal procedure to designate DPSs for shortnose sturgeon has not been undertaken.

Dadswell 1979) and Hudson Rivers (~61,000; Bain *et al.* 1998). No reliable estimate of the size of neither the total species nor the shortnose sturgeon population in the Northeastern United States exists. Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They feed on a variety of benthic and epibenthic invertebrates including molluscs, crustaceans (amphipods, chironomids, isopods), and oligochaete worms (Vladykov and Greeley 1963; Dadswell 1979 *in* NOAA Fisheries 1998). Shortnose sturgeon are long-lived (30-40 years) and, particularly in the northern extent of their range, mature at late ages. In the north, males reach maturity at 5 to 10 years, while females mature between 7 and 13 years.

Shortnose sturgeon have similar lengths at maturity (45-55 cm fork length) throughout their range, but, because sturgeon in southern rivers grow faster than those in northern rivers, southern sturgeon mature at younger ages (Dadswell *et al.* 1984). Shortnose sturgeon reach sexual maturity between approximately 6 and 10 years of age. Based on limited data, females spawn every three to five years while males spawn approximately every two years. The spawning period is estimated to last from a few days to several weeks. Spawning begins from late winter/early spring (southern rivers) to mid to late spring (northern rivers) when the freshwater temperatures increase to 8-9°C. Several published reports have presented the problems facing long-lived species that delay sexual maturity (Crouse *et al.* 1987; Crowder *et al.* 1994; Crouse 1999). In general, these reports concluded that animals that delay sexual maturity and reproduction must have high annual survival as juveniles through adults to ensure that enough juveniles survive to reproductive maturity and then reproduce enough times to maintain stable population sizes.

Total instantaneous mortality rates (Z) are available for the Saint John River (0.12 - 0.15; ages 14-55; Dadswell 1979), Upper Connecticut River (0.12; Taubert 1980b), and Pee Dee-Winyah River (0.08-0.12; Dadswell *et al.* 1984). Total instantaneous natural mortality (M) for shortnose sturgeon in the lower Connecticut River was estimated to be 0.13 (T. Savoy, Connecticut Department of Environmental Protection, personal communication). There is no recruitment information available for shortnose sturgeon because there are no commercial fisheries for the species. Estimates of annual egg production for this species are difficult to calculate because females do not spawn every year (Dadswell *et al.* 1984). Further, females may abort spawning attempts, possibly due to interrupted migrations or unsuitable environmental conditions (NOAA Fisheries 1998). Thus, annual egg production is likely to vary greatly in this species.

At hatching, shortnose sturgeon are blackish-colored, 7-11mm long and resemble tadpoles (Buckley and Kynard 1981). In 9-12 days, the yolk sac is absorbed and the sturgeon develops into larvae which are about 15mm total length (TL; Buckley and Kynard 1981). Sturgeon larvae are believed to begin downstream migrations at about 20mm TL. Laboratory studies suggest that young sturgeon move downstream in a 2-step migration; a 2-day migration by larvae followed by a residency period by young of the year (YOY), then a resumption of migration by yearlings in the second summer of life (Kynard 1997). Juvenile shortnose sturgeon (3-10 years old) reside in the interface between saltwater and freshwater in most rivers (NOAA Fisheries 1998).

In populations that have free access to the total length of a river (e.g., no dams within the species'

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range in a river: Saint John, Kennebec, Altamaha, Savannah, Delaware and Merrimack Rivers), spawning areas are located at the farthest upstream reach of the river (NOAA Fisheries 1998). Sturgeon spawn in upper, freshwater areas and feed and overwinter in both fresh and saline habitats. Shortnose sturgeon spawning migrations are characterized by rapid, directed and often extensive upstream movement (NOAA Fisheries 1998). Shortnose sturgeon typically leave the spawning grounds soon after spawning. Non-spawning movements include wandering movements in summer and winter (Dadswell *et al.* 1984, Buckley and Kynard 1985, O'Herron *et al.* 1993). Kieffer and Kynard (1993) reported that post-spawning migrations were correlated with increasing spring water temperature and river discharge.

Juvenile shortnose sturgeon generally move upstream in spring and summer and move back downstream in fall and winter; however, these movements usually occur in the region above the saltwater/freshwater interface (Dadswell *et al.* 1984, Hall *et al.* 1991). The species appears to be estuarine anadromous in the southern part of its range, but in some northern rivers, it is "freshwater amphidromous" (i.e., adults spawn in freshwater but regularly enter saltwater habitats throughout their life; Kieffer and Kynard 1993). Adult sturgeon occurring in freshwater or freshwater/tidal reaches of rivers in summer and winter often occupy only a few short reaches of the total length (Buckley and Kynard 1985). Summer concentration areas in southern rivers are cool, deep, thermal refugia, where adult and juvenile shortnose sturgeon congregate (Flourney *et al.* 1992, Rogers and Weber 1994, Rogers and Weber 1995, Weber 1996). While shortnose sturgeon are occasionally collected near the mouths of rivers and often spend time in estuaries, they are not known to participate in coastal migrations (Dadswell *et al.* 1984).

In the northern extent of their range, shortnose sturgeon exhibit three distinct movement patterns. These migratory movements are associated with spawning, feeding, and overwintering activities. In spring, as water temperatures rise above 8°C, pre-spawning shortnose sturgeon move from overwintering grounds to spawning areas. Spawning occurs from mid/late March to mid/late May depending upon location. In populations that have free access to the total length of a river (e.g., no dams within the species' range in a river: Saint John, Kennebec, Altamaha, Savannah, Delaware, and Merrimack Rivers), spawning areas are located at the farthest accessible upstream reach of the river, often just below the fall line (NOAA Fisheries 1998). Shortnose sturgeon spawn in upper, freshwater sections of rivers and feed and overwinter in both fresh and saline habitats. Shortnose sturgeon are believed to spawn at discrete sites within the river (Kieffer and Kynard 1996). In the Merrimack River, males returned to only one reach during the four years of the telemetry study (Kieffer and Kynard 1996). Squires (1982) found that during the three years of the study in the Androscoggin River, adults returned to a 1-km reach below the Brunswick Dam and Kieffer and Kynard (1996) found that adults spawned within a 2-km reach in the Connecticut River for three consecutive years. Spawning occurs over channel habitats containing gravel, rubble, or rock-cobble substrates (Dadswell *et al.* 1984; NOAA Fisheries 1998). Additional environmental conditions associated with spawning activity include decreasing river discharge following the peak spring freshet, water temperatures ranging from 8 - 12° C, and bottom water velocities of 0.4 to 0.7 m/sec (Dadswell *et al.* 1984; NOAA Fisheries 1998). The eggs are separate when spawned but become adhesive within approximately 20 minutes of fertilization (Dadswell *et al.* 1984). Between 8° and 12°C, eggs generally hatch after

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approximately 13 days. The larvae are photonegative, remaining on the bottom for several days. Buckley and Kynard (1981) found week old larvae to be photonegative and form aggregations with other larvae in concealment.

Adult shortnose sturgeon typically leave the spawning grounds soon after spawning. Non-spawning movements include rapid, directed post-spawning movements to downstream feeding areas in spring and localized, wandering movements in summer and winter (Dadswell *et al.* 1984; Buckley and Kynard 1985; O'Herron *et al.* 1993). Kieffer and Kynard (1993) reported that post-spawning migrations were correlated with increasing spring water temperature and river discharge. Young-of-the-year shortnose sturgeon are believed to move downstream after hatching (Dovel 1981) but remain within freshwater habitats. Older juveniles tend to move downstream in fall and winter as water temperatures decline and the salt wedge recedes. Juveniles move upstream in spring and feed mostly in freshwater reaches during summer.

The temperature preference for shortnose sturgeon is not known (Dadswell *et al.* 1984) but shortnose sturgeon have been found in waters with temperatures as low as 2 to 3°C (Dadswell *et al.* 1984) and as high as 34°C (Heidt and Gilbert 1978). However, temperatures above 28°C are thought to adversely affect shortnose sturgeon. In the Atlamaha River, temperatures of 28-30°C during summer months create unsuitable conditions and shortnose sturgeon are found in deep cool water refuges.

Shortnose sturgeon are also known to occur at a wide range of depths. A minimum depth of 0.6m is necessary for the unimpeded swimming by adults. Shortnose sturgeon are known to occur at depths of up to 30m but are generally found in waters less than 20m (Dadswell *et al.* 1984, Dadswell 1979). Shortnose sturgeon have also demonstrated tolerance to a wide range of salinities. Shortnose sturgeon have been documented in freshwater (Taubert 1980, Taubert and Dadswell 1980) and in waters with salinity of 30 parts-per-thousand (ppt) (Holland and Yeverton 1973, Saunders and Smith 1978). Mcleave *et al.* (1977) reported adults moving freely through a wide range of salinities, crossing waters with differences of up to 10ppt within a two hour period. The tolerance of shortnose sturgeon to increasing salinity is thought to increase with age (Kynard 1996). Shortnose sturgeon typically occur in the deepest parts of rivers or estuaries where suitable oxygen and salinity values are present (Gilbert 1989).

The Shortnose Sturgeon Recovery Plan (NOAA Fisheries 1998) identifies habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges) and mortality (resulting, for example, from impingement on cooling water intake screens, dredging and incidental capture in other fisheries) as principal threats to the species' survival. The recovery goal is identified as delisting shortnose sturgeon populations throughout their range, and the recovery objective is to ensure that a minimum population size is provided such that genetic diversity is maintained and extinction is avoided.

*Status of Shortnose Sturgeon in the Kennebec River*

The NOAA Fisheries recovery plan indicates that shortnose sturgeon occur in the estuarine complex formed by the Sheepscot, Kennebec, and Androscoggin rivers. Sturgeon were tagged

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with Carlin tags from 1977 to 1980, with recoveries in each of the following years. A Schnabel estimate of 7,222 adults was computed and is considered the most reliable estimate of population size for the combined estuarine complex (NOAA Fisheries 1998). Tracking studies to delineate spawning habitat were performed on the Androscoggin River during 1993. Gill nets were used to capture study animals and catch rates were recorded. Gill net catch-per-unit-effort during this study was the highest recorded in this area, suggesting that the population in the Androscoggin has increased since last surveyed.

On September 19, 1994, NOAA Fisheries received a petition from the Edwards Manufacturing Company, Inc., to delist shortnose sturgeon occurring in the Androscoggin and Kennebec rivers. In the ensuing status review, the NOAA Fisheries found that the petition to delist this population segment was not warranted because: 1) the population estimate used by the petitioners was less reliable than the best estimate accepted by NOAA Fisheries; 2) the best population estimate available did not exceed the interim threshold at which the population segment would be a candidate for delisting; 3) no recent information was available to assess the population dynamics; and 4) threats to shortnose sturgeon habitat still exist throughout the Androscoggin and Kennebec rivers (NOAA Fisheries 1996).

In the Kennebec River, movement to the spawning grounds occurs in early spring (April - May). Spawning sites have been identified near Gardiner in the Kennebec River, in the Androscoggin River, and may also occur in the Cathance River. In 1993, Maine DMR confirmed the exact location of the spawning sites in the Androscoggin River and determined that both adult and larval sturgeon use the region below the Brunswick Dam. Movement to the spawning areas is triggered by water temperature and fish arrive at the spawning locations when water temperatures are between 6-8 degrees Celsius. Shortnose sturgeon quickly leave the spawning grounds for summer foraging areas when temperatures exceed 15 degrees Celsius (Squiers et al., 1982).

Summer foraging areas have been identified in the Sasanoa River entrance and in the mainstem of the Kennebec River below Bath. Between June and September, shortnose sturgeon forage in shallow waters of mud flats that are covered with rooted aquatic plants. The vegetation provides many plant surfaces for the preferred food items of sturgeon including benthic crustaceans, molluscs, and insects. However, concentrations of fish have also been known to move up into the freshwater reaches of the Kennebec River. Summer foraging shortnose sturgeon have also been seen in Montsewag Bay in the Sheepscot River, which is located near the eastern end of the Sasanoa River (NOAA Fisheries, 1996b).

Until a study aimed at specifically determining overwintering locations was conducted by the Maine Department of Marine Resources (DMR) in 1996 for the Maine Department of Transportation (DOT), the sites thought to be the most likely overwintering sites were deep pools below Bluff head, and possibly in adjacent estuaries such as the Sheepscot (Squiers and Robillard 1997). This study of overwintering activity suggests that at least one overwintering site is located above Bath. This is based on tracking 15 shortnose sturgeon collected and released in the vicinity of the Sasanoa River (Pleasant Cove), Winnegance Cove (near the Doubling Point reach), and Merrymeeting Bay (north of Bath and the Sasanoa River entrance). Tracking was

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done from October through January. Eleven of these fish were relocated in Merrymeeting Bay. Two of the fish from Pleasant Cove were never found in Merrymeeting Bay; one Pleasant Cove fish moved to Winnegance Cove and back to Pleasant Cove and another moved to Days Ferry (half way between Bath and Merrymeeting Bay). All of the fish that continued to transmit after November were only found in upper Merrymeeting Bay on the east-side of Swan Island. This is consistent with the movement of shortnose sturgeon in the Delaware River (O'Herron, 1992). Overwintering sturgeon in the Delaware River are found in the area of Newbold Island, in the Trenton to Kinkora river reach, in an area geographically similar to the area around Swan Island.

Fisheries sampling was conducted from April 1997 through June 1998 by Normandeau Associates, using a semi-balloon otter trawl with 1 ½ inch mesh in the cod end and a ¼ inch liner. Sampling occurred monthly in April, May and December. At the request of NOAA Fisheries and Maine DMR sampling frequency increased to twice monthly from June through November, 1997, and April through June 1998. Trawl locations were located near the BIW outfitting pier (T1), south of the pier near the proposed dry dock facility (T2), and south of Trufant Ledge (T3). In August, 1997 additional stations were added near Sasanoa Point (T4), Hanson Bay (T5), north of Hospital Point on the west (T6) and east (T7) shores, and in Winnegance Creek (T8). During high slack tide, two tows were made at each sampling location. Three of these sampling locations are in the vicinity of the dredging area near Doubling Point (T6, T7 and T8). Trawl data indicate that no shortnose sturgeon were collected from Stations T6 or T7 between August 1997 and March 1998. One shortnose sturgeon was collected at Station T6 on April 1, 1998 and shortnose sturgeon were collected from Station T7 on April 1 and April 23, 1998. No shortnose sturgeon were collected in May or June 1998 at these stations. Several shortnose sturgeon were collected in August through October 1997 from Station T8 and one was captured on November 17, 1997. None were collected at this station from December 1997 through mid-May 1998. Three shortnose sturgeon were collected in late May 1998 and none were collected in June 1998.

Beginning in 1998, 17 shortnose sturgeon were collected via gillnet in the BIW area and were tagged and released near the capture site. Tracking began in 1998 and continued into 1999. Some of the fixed receivers were moved from their original locations and redeployed in areas of higher shortnose sturgeon abundance. In 1999, tracking was performed in three primary locations from late March through late April and mid-October through Mid-December. In late March through the beginning of April, 12 individual shortnose sturgeon were detected in the following locations: 8 near Swan Island, 1 near Chops Point, 1 near Thorne Island, 1 near BIW South Yard, 2 near Hospital Point, and 2 north of BIW Outfitting Pier. In mid April, individual shortnose sturgeon were detected in the following areas: 12 near BIW site, 1 near Thorne Island, 8 near Hospital Point, 1 near the south BIW dock, 2 north of the BIW Outfitting Pier, 1 at the entrance to the Sasanoa River, and 1 in Merrymeeting Bay south of Swan Island (Appendix B). Finally, at the end of April, 10 individual shortnose sturgeon were detected and were found in areas ranging from North to South of the BIW Pier, near Hospital Point, and near Museum Point. From October 21 through November 4, 1999, seven shortnose sturgeon were detected ranging from North to South of the BIW Pier, Chops Point, Fishers Eddy, and Doubling Point. From November 4 through November 12, 1999, four shortnose sturgeon were detected. These fish were

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tracked in areas that were similar to those documented at the end of October. Shortnose sturgeon number 10 and number 11 were tracked in the Doubling Point area at several different times between November 7 and November 9 and November 5 and November 6, respectively.

*Anthropogenic impacts*

The major known sources of anthropogenic mortality and injury of shortnose sturgeon include entrainment in dredges and entanglement in fishing gear. Injury and mortality can also occur at power plant cooling water intakes and structures associated with dams in rivers inhabited by this species. Shortnose sturgeon may also be adversely affected by habitat degradation or exclusion associated with riverine maintenance and construction activities and operation of power plants. Entanglement could include incidental catch in commercial or recreational gear as well as directed poaching activities. Shortnose sturgeon are most likely to interact with fisheries in and around the mouths of rivers where they are found. Thus, interactions are more likely to occur in state fisheries or unregulated fisheries than in the EEZ. Interactions are also most likely to occur during the spring migration (NOAA Fisheries 1998b). According to information summarized by NOAA Fisheries (1998b), operation of gillnet fisheries for shad may result in lethal takes of as many as 20 shortnose sturgeon per year in northern rivers. Shortnose sturgeon may be taken in ocean fisheries near rivers inhabited by this species. No comprehensive analysis of entanglement patterns is available at this time, in part due to the difficulty of distinguishing between shortnose and Atlantic sturgeon with the similarity in appearance of these two species. For example, several thousand pounds of "sturgeon" were reported taken in the squid/mackerel/butterfish fishery in 1992. However, this information is not broken down by species.

## ENVIRONMENTAL BASELINE

Environmental baselines for biological opinions include the past and present impacts of all state, federal or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR 402.02). The environmental baseline for this BO includes the effects of several activities that may affect the survival and recovery of the endangered species in the action area. The activities that shape the environmental baseline in the action area of this consultation generally include: dredging operations, water quality, scientific research, and fisheries, and recovery activities associated with reducing those impacts. An additional environmental impact to be addressed is the effects of discharges into the river on shortnose sturgeon.

*Dredging*

The construction and maintenance of Federal navigation channels and other maintenance dredging projects have been identified as a source of sturgeon mortality. The authorized Federal navigation project in the Kennebec River consists of a channel 27 feet deep at MLW and 500 feet wide extending about 13 miles upstream from the river mouth at Popham Beach to the city of Bath. About eight miles upstream of Bath, the Federal navigation project provides for a navigation channel 17 feet deep MLW and 150 feet wide along the east side of Swan Island for

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14 miles to the city of Gardiner. An 18-foot deep MLW and 150 feet wide channel extends through the ledge at Lovejoy Narrows opposite the upper end of Swan Island. A training wall was built along the Beef Rock Shoal opposite the lower end of Swan Island and another training wall was built opposite South Gardiner. A secondary channel 12 feet deep and 100 feet wide was provided along the west-side of swan Island to Richmond, with the navigation channel deepening to 15 feet MLW near the upper end of Swan Island. A 16-foot deep MLW channel was provided at Gardiner. A channel 11 feet deep MLW and 150 feet wide extends seven miles to the upper limit of the Federal navigation project in Augusta.

The ACOE has been performing maintenance dredging at the Doubling Point and Popham Beach reaches in the Kennebec River Federal Navigation Channel since 1950 at approximately three-year intervals. These sites have been dredged a total of approximately 15 times since 1950. Two dead fish, identified on site by ACOE personnel as shortnose sturgeon, were discovered with severe lacerations downstream of an ACOE navigation dredging project in the Kennebec River in October, 1991. No takes of shortnose sturgeon during dredging at the Doubling Point reach have been documented since this occurrence. The most recent BO issued for dredging at Doubling Point and Popham Beach during the November 1 – April 30 time frame authorizes the incidental taking of 4 shortnose sturgeon in any year that maintenance dredging occurs. Maintenance dredging of these reaches was performed in April 2002. No incidental takes were observed during that dredge cycle.

Dredging also regularly occurs at the BIW sinking basin. Dredging most recently occurred in April 2003. In March 2002, the ACOE contacted NOAA Fisheries regarding the proposed permit for maintenance dredging of the sinking basin. At this time, NOAA Fisheries told the ACOE that shortnose sturgeon are known to be in the vicinity of the BIW facility year-round but that concentrations of shortnose sturgeon would be largest from the late spring to early fall. At this time there was no evidence that shortnose sturgeon would be adversely affected by mechanical dredging. Consultation was concluded informally as ACOE implemented a condition in the permit that restricted dredging to occur only from November 1 – April 30 of any year. At that time, NOAA Fisheries concurred with the ACOE's determination that shortnose sturgeon were not likely to be adversely affected by the dredging activities in the sinking basin. On April 30, 2003, the ACOE contacted NOAA Fisheries to report that a shortnose sturgeon was killed by the mechanical dredge being used to dredge the sinking basin. This take was the first evidence of lethal interactions between shortnose sturgeon and mechanical dredges. A BO dated December 1, 2003 assessed the impacts of dredging the sinking basin for the November – February 28, 2004 time frame. Incidental take of 9 shortnose sturgeon (based on 79,300cy of material being dredged) is authorized by the accompanying incidental take statement.

*Contaminants and Water Quality*

Contaminants including heavy metals, polychlorinated aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs), can have serious, deleterious effects on aquatic life and are associated with the production of acute lesions, growth retardation, and reproductive impairment (Ruelle and Keenlyne 1993). Contaminants introduced into the water column or through the food chain, eventually become associated with the benthos where bottom dwelling

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species like shortnose sturgeon are particularly vulnerable.

Several characteristics of shortnose sturgeon life history including long life span, extended residence in estuarine habitats, and being a benthic omnivore, predispose this species to long term, repeated exposure to environmental contaminants and bioaccumulation of toxicants (Dadswell 1979). In the Connecticut River, coal tar leachate was suspected of impairing sturgeon reproductive success. Kocan (1993) conducted a laboratory study to investigate the survival of sturgeon eggs and larvae exposed to PAHs, a by-product of coal distillation. Only approximately 5% of sturgeon embryos and larvae survived after 18 days of exposure to Connecticut River coal-tar (i.e., PAH) demonstrating that contaminated sediment is toxic to shortnose sturgeon embryos and larvae under laboratory exposure conditions (NOAA Fisheries 1998).

Although there is scant information available on the levels of contaminants in shortnose sturgeon tissues, some research on other related species indicates that concern about the effects of contaminants on the health of sturgeon populations is warranted. Detectable levels of chlordane, DDE (1,1-dichloro-2, 2-bis(p-chlorophenyl)ethylene), DDT (dichlorodiphenyl-trichloroethane), and dieldrin, and elevated levels of PCBs, cadmium, mercury, and selenium were found in pallid sturgeon tissue from the Missouri River (Ruelle and Henry 1994). These compounds were found in high enough levels to suggest they may be causing reproductive failure and/or increased physiological stress (Ruelle and Henry 1994). In addition to compiling data on contaminant levels, Ruelle and Henry (1994) also determined that heavy metals and organochlorine compounds (i.e., PCBs) accumulate in fat tissues. Although the long term effects of the accumulation of contaminants in fat tissues is not yet known, some speculate that lipophilic toxins could be transferred to eggs and potentially inhibit egg viability. PCBs may also contribute to a decreased immunity to fin rot. In other fish species, reproductive impairment, reduced egg viability, and reduced survival of larval fish are associated with elevated levels of environmental contaminants including chlorinated hydrocarbons. A strong correlation that has been made between fish weight, fish fork length, and DDE concentration in pallid sturgeon livers indicates that DDE increase proportionally with fish size (NOAA Fisheries 1998).

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Point source discharges (i.e., municipal wastewater, paper mill effluent, industrial or power plant cooling water or waste water) and compounds associated with discharges (i.e., metals, dioxins, dissolved solids, phenols, and hydrocarbons) contribute to poor water quality and may also impact the health of sturgeon populations. The compounds associated with discharges can alter the pH or receiving waters, which may lead to mortality, changes in fish behavior, deformations, and reduced egg production and survival.

A contaminant analysis was completed for the shortnose sturgeon taken at the BIW sinking basin in April 2003. Fourteen metals, 1 semivolatile compound, 1 PCB congener, PCDDs and PCDF were detected in one or more of the tissue samples. Of these chemicals, cadmium and zinc were detected at concentrations above an adverse effect concentration reported for fish in the literature (ERC 2003).

The ACOE performed grain size analysis of the dredged material from Doubling Point in 1971, 1977, 1979, 1986, 1988, 1989, 1991, and 1995. The results of this testing has always shown the material to be sand, usually medium or medium to fine grained; sometimes with traces of silt and/or gravel. This material is believed to be a result of the current scour that prohibits settling of fine-grained silts and clays. Chemical analyses were not performed on the dredged material as sediments containing more than 15% fines (silt/clay) were absent. Chemical contaminants are not expected to adsorb to the coarse particles and the well-scoured nature of the substrate would disallow any significant chemical buildup. In addition, it is the ACOE's contention that there are no significant sources of pollutants located in the vicinity of the proposed dredging.

*Scientific Studies*

There have been limited studies targeting the shortnose sturgeon population present in the Kennebec River and estuarine complex – tracking studies in 1993 for spawning habitat; studies performed by Squiers et al. in 1979, 1980, and 1981; tracking by Squiers et al. to delineate overwintering locations in 1996; a trawl survey by Normandeau Associates from 1997-1998; and a tracking survey by Normandeau Associates from 1998-1999. As a result of techniques associated with these sampling studies, shortnose sturgeon have been subjected to capturing, handling, and tagging. It is possible that research in the action area may have influenced and/or altered the migration patterns, reproductive success, foraging behavior, and survival of shortnose sturgeon.

*Fisheries*

Shortnose sturgeon are taken incidentally in other anadromous fisheries along the East Coast and may be targeted by poachers (NOAA Fisheries 1998). The Kennebec River is an important corridor for migratory movements of various species including alewife (*Alosa pseudoharnegus*), American eel (*Anguilla rostrata*), Atlantic sturgeon (*Acipenser oxyrhynchus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*), rainbow smelt (*Osmerus mordax*), striped bass (*Morone saxatilis*) and lobster (*Homarus americanus*). Historically, the river and its tributaries supported the largest commercial fishery for shad in the State of Maine. However, pollution and the construction of dams decimated the shad runs in the late 1920's and early 1930's. Shortnose sturgeon in the Kennebec River may have been taken as bycatch in the shad fishery or other fisheries active in the action area. However, the incidental take of shortnose sturgeon in the river has not been well documented due to confusion over distinguishing between Atlantic sturgeon and shortnose sturgeon.

*Cumulative threats from other federally regulated activities*

Cumulative impacts from federal actions occurring in the Kennebec River have the potential to impact shortnose sturgeon. These include direct and indirect modification of habitat due to hydroelectric facilities and the introduction of pollutants from paper mills, sewers, and other industrial sources. Hydroelectric facilities can alter the river's natural flow pattern and temperatures and release of silt and other fine river sediments during dam maintenance can be deposited in sensitive spawning habitat nearby. Pollution has been a major problem for this river system, which continues to receive discharges from sewer treatment facilities and paper production facilities (metals, dioxin, dissolved solids, phenols, and hydrocarbons).

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## EFFECTS OF THE ACTION

This section of a BO assesses the direct and indirect effects of the proposed action on threatened and endangered species or critical habitat, together with the effects of other activities that are interrelated or interdependent (50 CFR 402.02). Indirect effects are those that are caused later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02).

The dredging of the Doubling Point reach of the Kennebec River resulted in the take of five shortnose sturgeon (see Appendix C – observer reports). On October 6, 2003, four shortnose sturgeon were observed by the endangered species observer. All four sturgeon were removed alive from the hopper and placed in a tub of water. Two of the four fish showed signs of external trauma but showed signs of mobility and respiration. These two fish were released approximately 2.5 nautical miles downriver of the dredge site. One of the fish went straight down and swam away while the other was last seen trying to swim but was not descending. The other two fish showed signs of more significant trauma and were less active and subsequently died onboard the barge. On October 8, 2003, one shortnose sturgeon was observed in the hopper. This fish was retrieved and placed in an aerated holding tank. The fish was very lively but showed signs of injury. The fish was released at the same release location as the other fish and was last seen swimming and descending to depth.

*Burial during disposal*

Burial is probably most likely during the overwintering period when fish would be more lethargic and situated in deeper areas (such as disposal sites). Overwintering areas characteristically are areas of lower energy conditions, like deep pools, where the fish can expend less energy during a time period when they are not actively foraging. However, the above discussion on the location of shortnose sturgeon during the overwintering period suggests that concentrations of sturgeon would not be found at the Doubling Point disposal site north of Bluff Head during October. Furthermore, fish tracked during the fall and winter of 1997 and spring and fall of 1999 in the Doubling Point area, which is north of the disposal site, were making significant movements. Should these fish stray down river to the disposal site north of Bluff Head, they would be expected to be less susceptible to burial than overwintering fish because they would be more likely to avoid the area.

*Destruction of habitat/prey resources*

While dredging and disposal can have an impact on benthic resources, there is no data to indicate that the Doubling Point reach is a foraging area for shortnose sturgeon. In fact, current velocities are quite high, which is what causes the shoaling problem. This makes it unlikely to be a significant foraging area.

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*Disruption of migratory movements*
Based on data from the Kennebec River, the dredging operations at the sinking basin may have the potential to disrupt the migratory behavior of adults migrating to one of several suspected overwintering sites north and south of the action area. The likelihood of this disruption occurring is highest in October and November when many shortnose sturgeon are expected to be migrating to the overwintering areas. However, the dredge operations are occurring in a concentrated area in the middle of the Kennebec River and shortnose sturgeon are expected to be able to migrate past the dredge operation in either an upstream or downstream direction. While migrating shortnose sturgeon may be disrupted (delayed or temporarily change direction) by the dredging operations, the dredging is not expected to significantly impair the ability of shortnose sturgeon to complete essential migratory behaviors.

*Release of contaminated material*
The coarse nature of the material in the Kennebec River Federal Navigation Channel at Doubling Point makes it unlikely that any contaminants would adhere to the sand particles (see p. 15). No release of contaminated material is expected.

## CUMULATIVE EFFECTS

Cumulative effects are defined in 50 CFR §402.02 as those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.

Impacts to shortnose sturgeon from non-federal activities are unknown in this river. It is possible that occasional recreational and commercial fishing for anadromous fish species may result in incidental takes of shortnose sturgeon. However, positive identification and distinction between Atlantic sturgeon and shortnose sturgeon are difficult and therefore, historically, takes have not been quantified. Pollution from point and non-point sources has been a major problem in this river system, which continues to receive discharges from sewer treatment facilities and paper production facilities (metals, dioxin, dissolved solids, phenols, and hydrocarbons). Contaminants introduced into the water column or through the food chain, eventually become associated with the benthos where bottom dwelling species like shortnose sturgeon are particularly vulnerable.

## INTEGRATION AND SYNTHESIS OF EFFECTS

The shortnose sturgeon is endangered throughout its entire range. The species exists as 19 separate populations that should be managed as such (NOAA Fisheries 1998). As indicated in the Recovery Plan (NOAA Fisheries 1998), the extinction of a single shortnose sturgeon population risks permanent loss of unique genetic information that is critical to the survival and recovery of the species. The shortnose sturgeon residing in the estuarine complex formed by the Kennebec, Androscoggin, and Sheepscot rivers form one of the 19 sturgeon populations.

The estimated population of adult shortnose sturgeon in the estuarine complex formed by the Sheepscot, Kennebec and Androscoggin Rivers is 7,222 individuals (NOAA Fisheries 1998). Very little is known about the juvenile population of shortnose sturgeon in the Kennebec.

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However, since the Bath region represents a significant summer foraging area for adults, it is possible that juvenile fish may also be found in the region.

As evidenced by the five takes during dredging operations, shortnose sturgeon in the action area were adversely affected by the maintenance dredging in the sinking basin. The number of shortnose sturgeon that was directly affected by the emergency action (5) is a relatively small percentage of the total Kennebec River population (approximately 0.001%). There are no significant indirect effects anticipated as a result of this action.

## CONCLUSION

Based on the evaluation of current information on the Kennebec River shortnose sturgeon population, and considering the documented level of take from this action, NOAA Fisheries concludes that the emergency dredging in October 2003 adversely affected the Kennebec River population of shortnose sturgeon. However, NOAA Fisheries believes that the dredging operations did not reduce the reproduction, numbers and distribution of the Kennebec River shortnose sturgeon population in a way that appreciably reduces their likelihood of survival and recovery in the wild or that of the species as a whole. It is the opinion of NOAA Fisheries that the emergency dredging of the Doubling Point reach in October 2003 adversely affected but is not likely to jeopardize the continued existence of either the Kennebec River shortnose sturgeon population or the species as a whole. This determination is based on the small number of shortnose sturgeon affected by this action. The number of shortnose sturgeon directly affected by the action represents a relatively small percentage of the Kennebec River population and the species as a whole. This conclusion is also based on the lack of any significant indirect effects expected as a result of this project.

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## INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. NOAA Fisheries interprets the term "harm" as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering (50 CFR §222.102). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Reasonable and prudent measures are non-discretionary, and must be undertaken by the ACOE so that they become binding conditions for the exemption in section 7(o)(2) to apply. The ACOE had a continuing duty to regulate the activity covered by this Incidental Take Statement. If the

ACOE (1) failed to assume and implement the terms and conditions or (2) failed to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the ACOE was required to report the progress of the action and its impact on the species to NOAA Fisheries as specified in the Incidental Take Statement [50 CFR §402.14(I)(3)].

*Extent of take*
The emergency action resulted in the incidental take of five shortnose sturgeon in the Kennebec River. Take occurred in the form of direct mortality, wounds, harm (injury of fish) and capture. The presence of an endangered species observer on board the dredge vessel allowed for the proper handling and identification of the fish that were taken. The presence of the observer may also have prevented the death of the three fish that were subsequently released.

*Reasonable and prudent measures*
Several conditions were provided to the ACOE prior to initiation of the emergency dredging and are listed in the BO (see p. 4). These conditions were implemented throughout the project. These conditions were designed to identify and minimize incidental take that might otherwise have resulted from implementation of the dredging of Doubling Point reach.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NOAA Fisheries has determined that, as long as the seasonal restrictions are followed, the maintenance dredging in the Kennebec River Federal Navigation Channel is not likely to jeopardize the continued existence of endangered shortnose sturgeon located in the vicinity of the project area. To further reduce the adverse effects of the dredging on listed species, NOAA Fisheries recommends that ACOE implement the following conservation recommendations.

(1) Population information on certain life stages is still sparse for this river system. The ACOE should support further studies to evaluate habitat and the use of the river, in general, by juveniles.

## REINITIATION OF CONSULTATION

This concludes formal consultation on the emergency dredging of the Kennebec River Federal Navigation Channel that occurred in October 2003. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may not have been previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species; or (4) a new species is listed or

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critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, Section 7 consultation must be reinitiated immediately.

## LITERATURE CITED


ACOE, 1997. Biological assessment for shortnose sturgeon (*Acipenser brevirostrum*) in the Kennebec River, Bath, Maine. Prepared by: USACOE, Waltham, MA.

ACOE, 1991. Biological Assessment for shortnose sturgeon, Connecticut River below Hartford, Connecticut. Prepared by: Impacts Analysis Division, USACOE, Waltham, MA.

Buckley, J. and B. Kynard. 1985. Habitat use and behavior of pre-spawning and spawning shortnose sturgeon, *Acipenser brevirostrum*, in the Connecticut River. North American Sturgeons: 111-117.

Environmental Research and Consulting (ERC) Inc. 2003. Contaminant Analysis of tissue from a shortnose sturgeon (*Acipenser brevirostrum*) from the Kennebec River, Maine. Unpublished report submitted to NOAA Fisheries. 31 pp.

Kieffer, M.C. and B. Kynard. 1993. Annual movements of shortnose and Atlantic sturgeons in the Merrimack River, Massachusetts. Transactions of the American Fisheries Society 1221: 1088-1103.

Kocan, R.M., M.B. Matta, and S. Salazar. 1993. A laboratory evaluation of Connecticut River coal tar toxicity to shortnose sturgeon (*Acipenser brevirostrum)* embryos and larvae. Final Report to the National Oceanic and Atmospheric Administration, Seattle, Washington.

NOAA Fisheries. 1998. Recovery plan for the shortnose sturgeon (*Acipenser brevirostrum*). Prepared by the Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland 104 pp.

NOAA Fisheries. 1996. Status Review of shortnose sturgeon in the Androscoggin and Kennebec Rivers. Northeast Regional Office, National Marine Fisheries Service, unpublished report. 26 pp.

Normandeau Associates, 2001. Bath Iron Works dredge monitoring results. Prepared by Normandeau Associates, Inc. Yarmouth, Maine, unpublished report. 11 pp.

Normandeau Associates, 2003. Bath Iron Works dredge monitoring results -- 2003. Prepared by Normandeau Associates, Inc. Yarmouth, Maine, unpublished report. 5 pp.

O'Herron, J.C., K.W. Able, and R.W. Hastings. 1993. Movements of shortnose sturgeon


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(*Acipenser brevirostrum)* in the Delaware River. Estuaries 16:235-240.

Ruelle, R., and K.D. Keenlyne. 1993. Contaminants in Missouri River pallid sturgeon. Bull. Environ. Contam. Toxicol. 50: 898-906.

Ruelle, R. and C. Henry. 1994. Life history observations and contaminant evaluation of pallid sturgeon. Final Report U.S. Fish and Wildlife Service, Fish and Wildlife Enhancement, South Dakota Field Office, 420 South Garfield Avenue, Suite 400, Pierre, South Dakota 57501-5408.

Squiers, T., L. Flagg, and M. Smith. 1982. American shad enhancement and status of sturgeon stocks in selected Maine waters. Completion report, Project AFC-20

Squiers, T. And M. Robillard. 1997. Preliminary report on the location of overwintering sites for shortnose sturgeon in the estuarial complex of the Kennebec River during the winter of 1996/1997. Unpublished report, submitted to the Maine Department of Transportation.

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## Appendix A

## MONITORING SPECIFICATIONS FOR HOPPER DREDGES

### *I. EQUIPMENT SPECIFICATIONS*

*A. Baskets or screening*

Baskets or screening must be installed over the hopper inflows with openings no smaller than 4 inches by 4 inches to provide 100% coverage of all dredged material and shall remain in place during all dredging operations. Baskets/screening will allow for better monitoring by observers of the dredged material intake for shortnose sturgeon and their remains. The baskets or screening must be safely accessible to the observer and designed for efficient cleaning.

*B. Draghead*

The draghead of the dredge shall remain on the bottom at all times during a pumping operation, except when:

1) the dredge is not in a pumping operation, and the suction pumps are turned completely off

2) the dredge is being re-oriented to the next dredge line during borrow activities

3) the vessel's safety is at risk (i.e., the dragarm is trailing too far under the ship's hull).

At initiation of dredging, the draghead shall be placed on the bottom during priming of the suction pump. If the draghead and/or dragarm become clogged during dredging activity, the pump shall be shut down, the dragarms raised, whereby the draghead and/or dragarm can be flushed out by trailing the dragarm along side the ship. If plugging conditions persist, the draghead shall be placed on deck, whereby sufficient numbers of water ports can be opened on the draghead to prevent future plugging.

Upon completion of a dredge track line, the drag tender shall:

1) throttle back on the RPMs of the suction pump engine to an idling speed (e.g., generally less than 100 RPMs) prior to raising the draghead off the bottom, so that no flow of material is coming through the pipe into the dredge hopper. Before the draghead is raised, the vacuum gauge on the pipe should read zero, so that no suction exists both in the dragarm and draghead, and no suction force exists that can impinge a turtle on the draghead grate;

2) hold the draghead firmly on the bottom with no flow conditions for approximately 10 to 15 seconds before raising the draghead; then, raise the draghead quickly off the bottom and up to a mid-water column level, to further reduce the potential for any adverse

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interaction with nearby sturgeon;

3) re-orient the dredge quickly to the next dredge line; and

4) re-position the draghead firmly on the bottom prior to bringing the dredge pump to normal pumping speed, and re-starting dredging activity.

*C. Floodlights*

Floodlights must be installed to allow the NOAA Fisheries-approved observer to safely observe and monitor the baskets or screens.

*D. Intervals between dredging*

Sufficient time must be allotted between each dredging cycle for the NOAA Fisheries-approved observer to inspect and thoroughly clean the baskets and screens shortnose sturgeon and/or sturgeon parts and document the findings. Between each dredging cycle, the NOAA Fisheries-approved observer should also examine and clean the dragheads and document the findings.

## *II. OBSERVER PROTOCOL*

*A. Basic Requirement*

A NOAA Fisheries-approved observer with demonstrated ability to identify shortnose sturgeon must be placed aboard the dredge(s) being used; starting immediately upon project commencement to monitor for the presence of listed species and/or parts being entrained or present in the vicinity of dredge operations.

*B. Duty Cycle*

Two NOAA Fisheries-approved observers must be onboard during dredging until the project is completed. While onboard, observers shall provide the required inspection coverage on a rotating basis of six hours on and six hours off each day so that all dredging operations are observed.

*C. Inspection of Dredge Spoils*

During the required inspection coverage, the trained NOAA Fisheries-approved observer shall inspect the galvanized screens and baskets at the completion of each loading cycle for evidence of shortnose sturgeon. If any whole shortnose sturgeon (alive or dead) or shortnose sturgeon parts are taken incidental to the project(s), Julie Crocker (978) 281-9328 est.6530 or Pat Scida (978) 281-9208 must be contacted within 24 hours of the take. An incident report for shortnose sturgeon take shall also be completed by the observer and sent to Julie Crocker via FAX (978) 281-9394 within 24 hours of the take. Incident reports shall be completed for every take regardless of the state of decomposition. Every incidental take (alive or dead, decomposed or fresh) should be photographed. A final report including all completed load sheets, photographs,

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and relevant incident reports are to be submitted to the attention of Julie Crocker, NOAA Fisheries, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930.

*E. Disposition of Parts*

If any whole shortnose sturgeon (alive or dead, decomposed or fresh) or shortnose sturgeon parts are taken incidental to the project(s), Julie Crocker (978) 281-9328 ext. 6530 or Pat Scida (978) 281-9208 must be contacted within 24 hours of the take. All whole dead shortnose sturgeon, or shortnose sturgeon parts should be photographed and described in detail on the Incident Report of Shortnose Sturgeon Take (in Appendix A). The photographs and reports should be submitted to Julie Crocker, NOAA Fisheries, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930-2298. Disposition of dead shortnose sturgeon will be determined by NOAA Fisheries.

## *III. OBSERVER REQUIREMENTS*

Submission of resumes of endangered species observer candidates to NOAA Fisheries for final approval ensures that the observers placed onboard the dredges are qualified to document takes of endangered and threatened species, to confirm that incidental take levels are not exceeded, and to provide expert advice on ways to avoid impacting endangered and threatened species. NOAA Fisheries does not offer certificates of approval for observers, but approves observers on a case-by-case basis.

*A. Qualifications*

Observers must be able to:

1) differentiate between shortnose (*Acipenser brevirostrum*) and Atlantic (*Acipenser oxyrinchus*) sturgeon and their parts

2) handle live sturgeon

3) correctly measure the total length and width of live and whole dead sturgeon species

4) observe and advise on the appropriate screening of the dredge's overflow, skimmer funnels, and dragheads; and

*B. Training*

Ideally, the applicant will have educational background in biology, general experience aboard dredges, and hands-on field experience with the species of concern. For observer candidates who do not have sufficient experience or educational background to gain immediate approval as endangered species observers, we note below the observer training necessary to be considered admissible by NOAA Fisheries. We can assist the ACOE by identifying groups or individuals capable of providing acceptable observer training. Therefore, at a minimum, observer training must include:

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1) instruction on how to identify sturgeon and their parts;

2) instruction on appropriate screening on hopper dredges for the monitoring of sturgeon(whole or parts);

3) demonstration of the proper handling of live sturgeon incidentally captured during project operations;

4) instruction on standardized measurement methods for sturgeon lengths and widths; and

5) instruction on dredging operations and procedures, including safety precautions onboard.

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# Incident Report of Shortnose Sturgeon Take
# Kennebec River Federal Navigation Emergency Dredging Project

Species _____ Date _____ Time (specimen found) _____

Geographic Site _____
Location: Lat/Long _____
Vessel Name _____ Load # _____
Begin load time _____ End load time _____
Begin dump time _____ End dump time _____

Sampling method _____
Condition of screening _____
Location where specimen recovered
_____
_____
__

Weather conditions _____
_____

Water temp: Surface _____ Below midwater _____

**Species Information**: *(please designate cm/m or inches.)*

Fork length (or total length) _____ Weight _____

Condition of specimen/description of animal
_____
_____
_____

Fish Decomposed: NO SLIGHTLY MODERATELY SEVERELY

Fish tagged: YES / NO *Please record all tag numbers.* Tag # _____

Photograph attached: YES / NO
(please label *species, date, geographic site* and *vessel name* on back of photograph)

Comments/other (include justification on how species was identified)
_____
_____
_____
_____

Observer's Name _____
Observer's Signature _____

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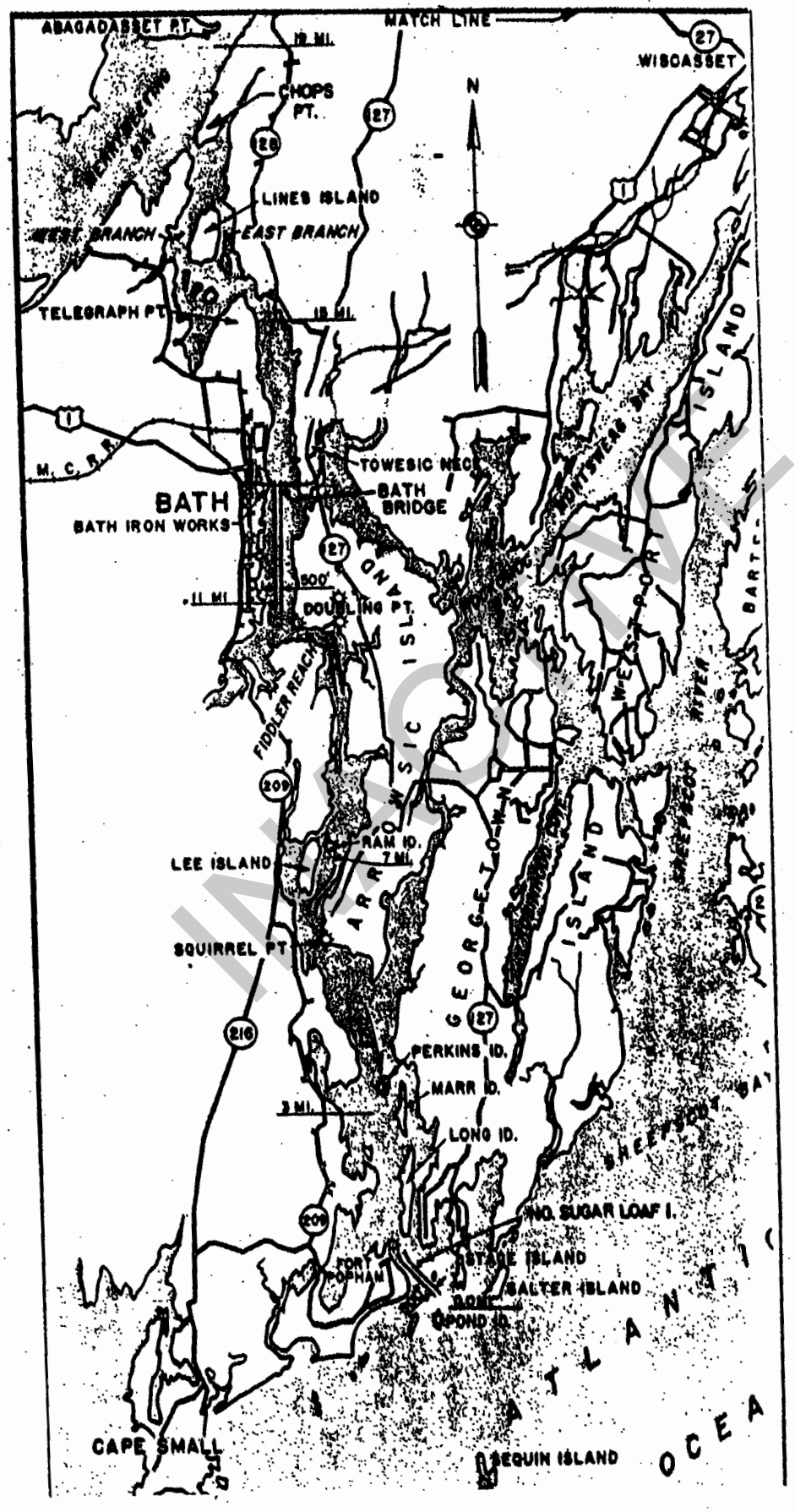
APPENDIX B

Map of Project Location



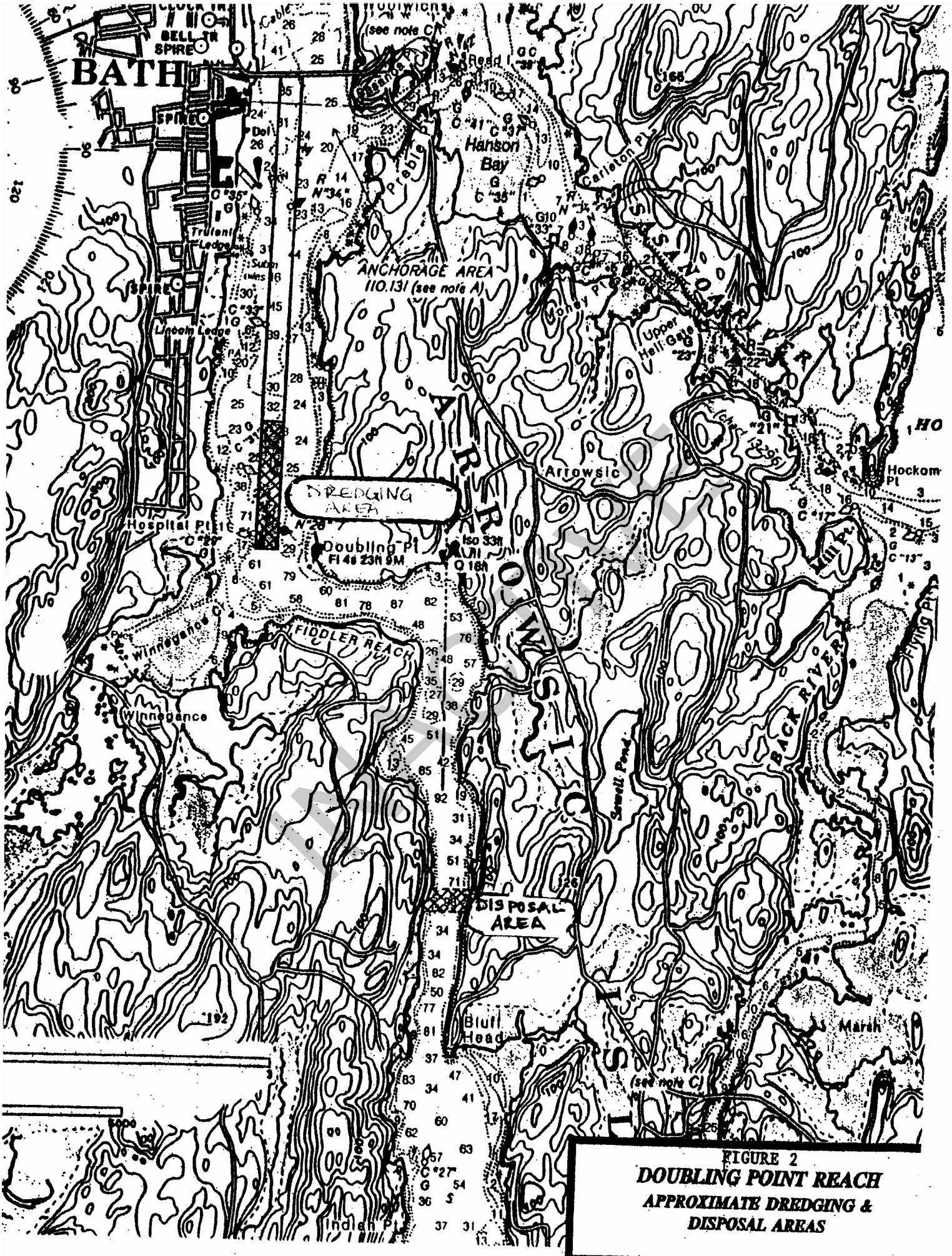



FIGURE 2

**DOUBLING POINT REACH**

**APPROXIMATE DREDGING & DISPOSAL AREAS**

# Appendix C

## ENDANGERD SPECIES OBSERVER PROGRAM

Dredge: Padre Island

Project: Kennebec River, ME

Date: 10/06/03

Load # 4 Times: Start 1515 End 1754 Dump 2017
Location(**lat/long**, station) Dowling Point Tide Stage 1.5
Weather (beau SS, wind spd & dir, temp,etc) BSS=0, winds light + variable, 63F, sunny
H2O Surf.Temp(C) 60 F Time 1700 Below Mid-Depth(C) 60F Time 1706
Are there incidents involving endangered or protected species? Yes ~~No~~ No

Port Draghead: clear, Deflector: good
Stbd Draghead: clear, some line Deflector: good

Port Inflow Discharge, Fore: woody debris, grasses Mid: /
Port Inflow Discharge, Aft: " "

Stbd Inflow Discharge, Fore: woody debris, grasses Mid: /
Stbd Inflow Discharge, Aft: " "

Port Fore)Skimmer: woody debris
Stbd (Aft) Skimmer: " "

Comments (type of material, details of biota species in screens, screen condition/effectiveness, etc.):
Type of material: sand
Biota species: grasses, 4 shortnose Sturgeon, see report.
Condition of screening: see report.

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Bridge Watch Summary

| Species | # of Sightings | # of Animals | Comments |
|---|---|---|---|
| ~~0~~ | | | |

Observers On Duty: Susan Hann

Upon boarding the dredge *Padre Island* I inspected the inflow screening and found all inflow boxes to be properly screened. Inflow occurs on the GLD&D dredges at the end of four pipes, two of which empty into the forward section of the hopper, port and starboard, and two of which discharge at the aft end of the hopper, port and starboard. Cages are attached directly to the ends of the discharge pipes and are constructed of steel bar-stock, welded in a grid pattern, with openings of approximately 4" x 4". Observers gain access into the top of these cages through hinged trap doors. The aft walls of the cages are hinged and can be opened by hydraulic rams in order to clear the cages of debris after inspection by observers. The original turtle screening had been modified to meet the Kennebec River Project specifications by the addition of wire mesh, reducing the screening to 2" x 2".

After the first load was completed the wire mesh was showing significant signs of wear and the captain and project manager made arrangements to add heavier screening. By the third load, the doors on the cages were also creeping open slightly, creating a crack of approximately 3-5". The hydraulic rams were unable to keep the doors completely shut against the intense pressure created by the debris accumulation during the loading process. This situation can be attributed to the use of the 2" x 2" screening, which allows very little to pass through, creating a solid wall that the dredge material is discharged into.

The project manager and captain had the engineering department quickly fabricated steel clips that could be fitted on the doors to keep them shut. The heavier screening and door clips were to be added at the end of load #4. Unfortunately, during load #4, I observed a sturgeon swimming in the hopper. I notified the mate and dredging was immediately suspended. Upon closer examination, I found 4 sturgeon swimming in the hopper. With help from the crew, we retrieved all four fish and identified them as shortnose sturgeon, *Acipenser brevirostrum*. All fish were quickly placed in a tub of water. Two of the four fish showed minimal signs of external trauma and showed signs of mobility and respiration. The other two fish showed more significant trauma and were less active. We consulted Chris Slay and the decision was made to try and release the fish approximately 2.5 nautical miles (NM) down river from the dredge site and .25 NM down river from the disposal site. As the fish should be currently making their seaward migration, this seemed to provide the best chance for their survival.

All photographs and data are attached.

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M/V Padre Island
Kennebec River, ME
Doubling Point
10/06/03
Load 4

4 short nose sturgeon takes.

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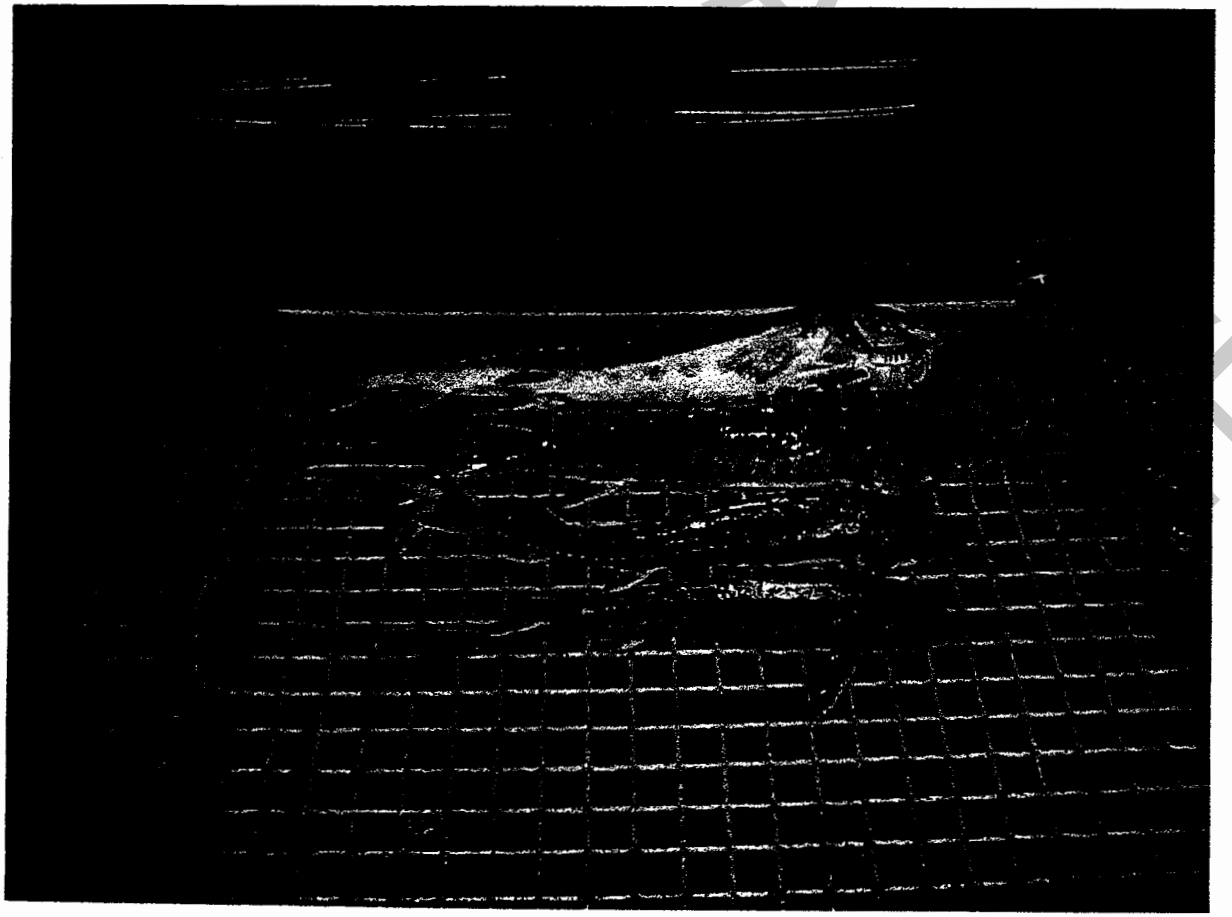
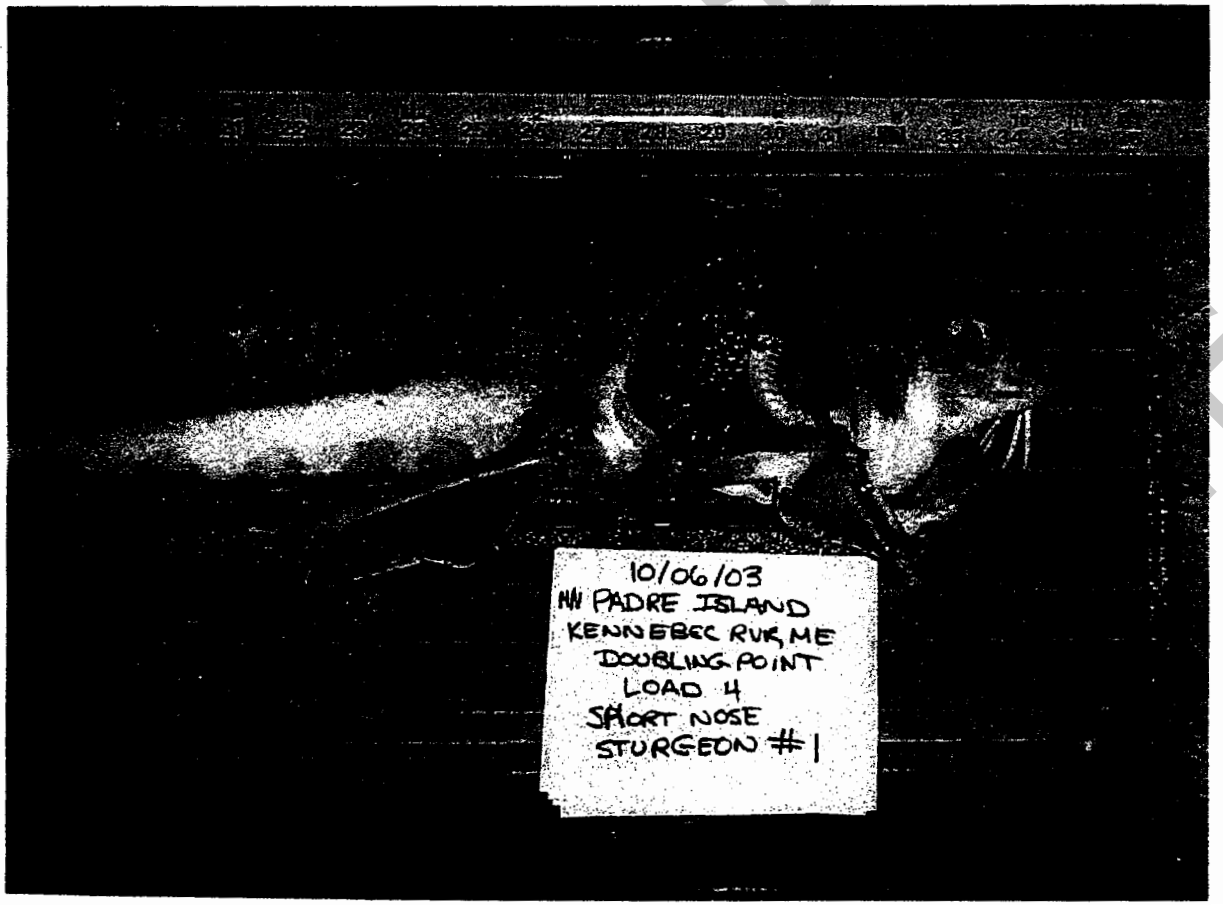


Closer look at #1's injuries.

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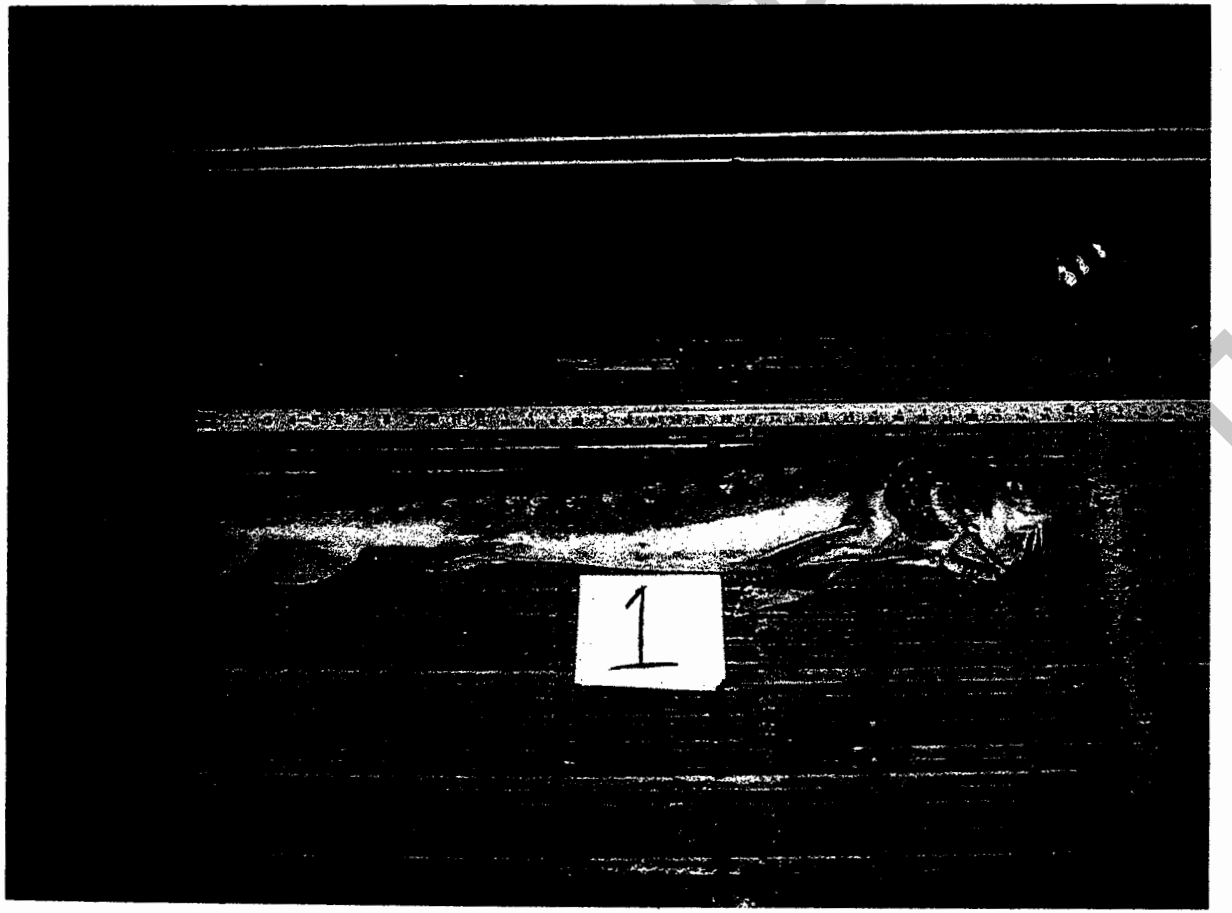
MI: Padre Island
Kennebec River, ME
Doubling Point
10/06/03
Load 4

F ½ length = 34.4 inches
Total length = 38.1 inches

Observations:
Sliced anal fin (upper lobe), blood in anal vent, operulum (right side) ripped, missing 5th + 7th scutes on right side, both pectorals torn at the base, both eyes injured. Remains held, fish deteriorated + died.

Shortnose sturgeon - specimen #1

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