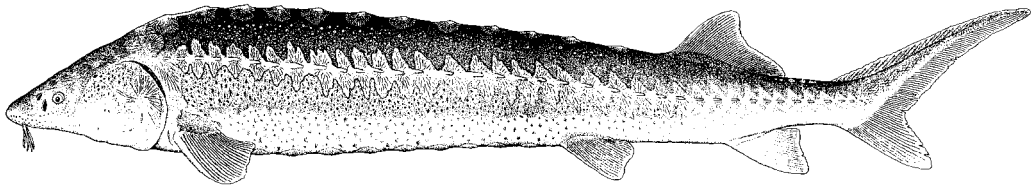
Environmental Biology of Fishes **60:** 362, 2001.

Threatened fishes of the world: *Acipenser gueldenstaedtii* Brandt & Ratzenburg, 1833 (Acipenseridae)

Paul Vecsei
Department of Zoology, University of Guelph, Guelph, Ontario N1G 2W1 Canada (e-mail: pvecsei@uoguelph.ca)



Common names: Russian sturgeon (E), esturgeon Russe (F), Russkii osetr (R), nisetru (Ro), Ruska esetra (Bu), waxdick (G). **Conservation status:** The Russian sturgeon is in Appendix II of CITES and all stocks are considered endangered. IUCN also ranks all stocks as endangered.
Identification: D 27–51, A 18–33 rays, dorsal scutes 8–18, lateral scutes 24–50 and ventral scutes 6–13. Body elongated and spindle shaped with greatest depth usually just posterior to head. Rostrum varies greatly between stocks but generally between 4 to 6.5% of TL. Two pairs of barbels, originating closer to the tip of snout than mouth. Mouth inferior with upper lip indented in the middle with lower lip interrupted. Degree of ossification variable but all rows of scutes remain rather prominent throughout life. Some individuals have a very prominent longitudinal row of laterodorsal scutlets between the row of dorsal and lateral scutes. These scutlets are somewhat rounded in *A. gueldenstaedtii* while more triangular in *A. persicus*. Entire skin surface is covered with small snowflake-like denticles. Postdorsal plates 0–2 in pairs, post anal plates 1–2. Russian sturgeon can exceptionally reach a weight of 100 kg but most large specimens today weigh approximately 60 kg and measure 200 cm in length. Average weight of migrants ranges from 10 to 25 kg (Chebanov personal communication). Color usually dark olive or even black with light scutes strongly contrasting against dark body. Scutes range in color from almost white to a yellowish gold. Ventral surface off-white to pale yellow. Illustration of a Volga River 137 cm male by Paul Vecsei. **Distribution:** *A. gueldenstaedtii* is more wide ranging than its close relative *A. persicus*. A diadromous fish, it is distributed throughout the Black Sea, Sea of Azov and Caspian Sea. **Abundance:** The largest remaining population of *A. gueldenstaedtii* is the Volga–Caspian Sea stock. The construction of the Volgograd dam placed greater reliance on hatchery production since migrating *A. gueldenstaedtii* were confined to spawning in reaches below the dam. In recent years, this species has been the focus of extensive poaching. The abundance of this species is sure to decline further, now that numerous hatcheries have closed due to the worsening of the economic situation. Available spawning grounds are limited in all watersheds because of dams. Pollution has also affected reproductive success of stocks. Many of the Volga spawning adults showed degenerative conditions and anomalities in gameto/gonadogenesis (Khodorevskaya et al. 1997). **Habitat and ecology:** While at sea, the Russian sturgeon feeds in shallow waters on molluscs and to a lesser degree small benthic fishes. In winter they move to deeper waters where the temperature is more constant (Levin 1981). They are also known to consume crustaceans. Juvenile *A. gueldenstaedtii* feed primarily on crustaceans with mysids, corophiids, gamarids and polychaetes making up most of their diet. The eggs of *A. gueldenstaedtii* are consumed by numerous species of fishes, in particular bream, *Abramis brama*, and the Caspian roach, *Rutilus rutilus*. Larvae and juvenile *A. gueldenstaedtii* moving downstream are preyed upon by young beluga, *Huso huso*, and in particular the wels, *Silurus glanis* (Vlasenko et al. 1989). Depending on the season, *A. gueldenstaedtii* occurs at a depth ranging from 2 to 100 m. In the north Caspian, juveniles commonly occur at depths of 2 to 5 m (Levin 1982). Migrations for spawning commence when water temperature reaches 4°C. Cues inducing migration include increase in discharge of freshwater into the sea and rising water temperature. **Reproduction:** From the Black Sea, *A. gueldenstaedtii* migrates into the Danube and historically ascended as far as Bratislava (Balon 1967, 1968). They now can go no further than the Iron Gate Dam I in Romania situated 942 km upstream from the mouth. Runs into the Dniester and Dnieper are severely depleted. In the Sea of Azov, a small number ascend the Don. On the Kuban River, it has become purely a put and take fishery. Spawning takes place in current of 1 to 1.5 m s^{-1} over gravel substrate or coarse sand at a depth of 4 to 25 m at water temperatures of 9–15°C (Vlasenko et al. 1989). Only the Volga River has large numbers of *A. gueldenstaedtii* migrating to spawning grounds but nearly all of these are intercepted by poachers or the legal caviar fishery. **Threats:** Dams have greatly reduced the available spawning grounds for this species. On the Volga, of an original 3600 ha available for spawning prior to dam construction, there now remains 430 ha (Vlasenko 1990). Poaching is so rampant now that few sturgeon can run the gauntlet of nets without being caught. **Conservation action:** Before the collapse of the USSR, the sturgeon fishery was under strict management which included a quota system, slot size restrictions, seasonal closures and a ban on open sea harvesting. In June of 1996, there was an agreement between the five states bordering the Caspian Sea to ban open sea fishing and a quota system was reintroduced. In 1994, over 40 million juvenile *A. gueldenstaedtii* were released into the Caspian Sea by Russian and Iranian hatcheries (Artyukhin personal communication). In the same year, 11 million juvenile *A. gueldenstaedtii* were stocked into the Sea of Azov by hatcheries along the Kuban River near Krasnodar. These sturgeon of hatchery origin now account for over 90% of the total harvest of this species in the Azov basin (Chebanov personal communication). **Remarks:** At present, natural reproduction of *A. gueldenstaedtii* occurs only in the undammed Ural River. The Kura and Terek rivers are thought to no longer contribute any sturgeon to the Caspian Sea through natural reproduction.

Balon, E.K. 1967. Vývoj ichtyofauny Dunaja, jej súčasný stav a pokus o prognózu d'alších zmien po výstavbe vodných diel (Evolution of the Danube ichthyofauna, its recent state and an attempt to predict further changes after the construction of the planned hydroelectric power-stations and diversion schemes). Biologické práce 13: 1–121 (in Slovak).
Balon, E.K. 1968. Ďalší nález mlade *Acipenser güldenstaedti colchicus* Marti, 1940 v československom úseku Dunaja (A further discovery of a juvenile Russsian sturgeon in the Czechoslovak part of the Danube). Ac. Rer. Natur. Mus. Nat. Slov. (Bratislava) 14: 95–100 (in Slovak).
Khodorevskaya, R.P., G.F. Dovgopol, O.L. Zhuravleva & A.D. Vlasenko. 1997. Present status of commercial stocks of sturgeon in the Caspian Sea basin. Env. Biol. Fish. 48: 209–219.
Levin, A.V. 1981. Distribution and behavior of young Russian sturgeon, *Acipenser gueldenstaedtii* (Acipenseridae) in the Caspian Sea. J. Ichthyol. 21: 138–144.
Levin, A.V. 1982. Substrate selection, daily rhythm of vertical distribution and swimming speed of juvenile Russian sturgeon, *Acipenser gueldenstaedtii*. J. Ichthyol. 22: 130–136.
Vlasenko, A.D. 1990. Sturgeon population size of the Caspian Sea. Rybnoe Khozyaistvo 7: 53–56 (in Russian).
Vlasenko, A.D., A.V. Pavlov, L.I. Sokolov & V.P. Vasil'ev. 1989. *Acipenser gueldenstaedti* Brandt, 1833. pp. 294–344. *In:* J. Holčík (ed.) The Freshwater Fishes of Europe, vol. 1, part II, General Introduction to Fishes, Acipenseriformes, AULA-Verlag, Wiesbaden.