

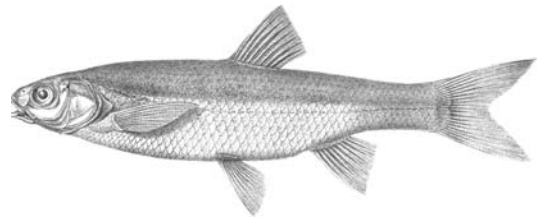
Threatened fishes of the world: *Chondrostoma arrigonis* (Steindachner, 1866) (Cyprinidae)

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Common name: Loina (Spanish). Júcar Nase (English). **Conservation status:** Endangered (EN A1ae B1+2bcde, Spanish Red Data book, Doadrio 2002). Critically Endangered (CR A2ace; B2ab (i, ii, iii, iv, v), Crivelli 2005, Smith and Darwall 2006). **Identification:** D III + (7)8, A III + 8–10, V II + 8, P I + 14–15, pharyngeal teeth 6–5 or 5–5, LL 44–53, gill rakers 16–23. Reaches 250 mm TL. A slender-bodied fish, compressed from side to side. The head is small with the mouth ventral. From below the mouth is arched; the upper lip is soft and fleshy, but the lower lip has a thin horny layer. The outline of the dorsal fin is straight or slightly concave, that of the anal fin is slightly concave. Drawing by F. Steindachner. **Distribution:** *C. arrigonis* is restricted to the Júcar river basin in eastern Spain (Elvira 1980). **Abundance:** It was a rather common species in the past all over its distribution range. Nevertheless, a field study carried out at 30 sites in the Júcar basin in 2001 found only 21 specimens at three sites, and in 2004 found only 10 specimens



at one of the three sites. The known current range of the species only includes ten sites at three river Júcar tributaries: rivers Cabriel (five sites), Magro (four sites) and Sellent (one site) (after the field work of 2005 made by the Valencian Community authorities). **Habitat and ecology:** *C. arrigonis* is a rheophilic, schooling fish which lives in all river sections, but mainly in the middle reaches. **Reproduction:** Spawning takes place in gravel beds from March to May, after an upstream migration by the adults. **Threats:** The species is threatened by pollution and excessive water extraction, and by the introduction of exotic fishes. Some major predators, such as Pike *Esox lucius* L., 1758, Largemouth Bass *Micropterus salmoides* (Lacépède, 1802) and Zander *Sander lucioperca* (L., 1758) are currently widespread in the Júcar river basin (Elvira and Almodóvar 2001). The water transfer system Tagus-Segura has allowed a close and neighbouring species, the Tagus Nase *Chondrostoma polylepis* Steindachner, 1865, to enter the Júcar basin, compete and

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hybridize with *C. arrigonis* (Elvira 1995). **Conservation action:** The species has been officially protected since 2002 by the Spanish National Catalogue of Threatened Species, and is under the category ‘vulnerable’. It has been considered ‘in danger of extinction’ in the Valencian Community territory since 2004. It was included, under the synonymy of *Chondrostoma toxostoma* (Vallot, 1837), as ‘protected species’ in the annex III of the Bern Convention. The Council Directive of the European Economic Community on the Conservation of Natural Habitats and of Wild Fauna and Flora of 1992 includes the species (under the synonymy of *C. toxostoma*) in its Annex II ‘species of Community interest whose conservation requires the designation of special areas of conservation’. Several river sections of the original distribution range of the species are listed as sites of Community importance for the European NATURA 2000 network. **Conservation recommendations:** Due to the low population densities of the species currently found in the wild, the most urgent conservation measure would be to keep some specimens in a fish culture facility for artificial breeding. Re-stocking ought to be undertaken only when current threats (water pollution, stream regulation and fish introductions) have been corrected. **Remarks:** The Júcar Nase was formerly considered as a subspecies, *C. toxostoma arrigonis*, by Elvira (1980, 1987); but treated as a distinct species, *C. arrigonis*, by Kottelat (1997) and Elvira (1997). Kottelat (1997) included *Chondrostoma turiense* Elvira, 1987 under the synonymy of *C. arrigonis*. However, Elvira (1997) and Doadrio (2002) considered both as two close but different species.

Doadrio and Carmona (2004) found that *C. turiense* showed a genetic divergence of 1.6–2.1% with respect to *C. arrigonis*, and of 1.1–1.3% with respect to *Chondrostoma miegii* Steindachner, 1866.

References

- Crivelli AJ (2005) *Chondrostoma arrigonis*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species. <www.iucnredlist.org>
- Doadrio I (ed) (2002) Atlas y libro rojo de los peces continentales de España. Dirección General de Conservación de la Naturaleza/Museo Nacional de Ciencias Naturales, 2nd edn. Madrid, Spain, 374 pp
- Doadrio I, Carmona JA (2004) Phylogenetic relationships and biogeography of the genus *Chondrostoma* inferred from mitochondrial DNA sequences. Mol Phylogenet Evol 33:802–815
- Elvira B (1980) Notas sobre la distribución y sistemática de la loina, *Chondrostoma toxostoma arrigonis* (Steindachner, 1866) (Pisces, Cyprinidae). Bol Estación Central Ecol 9(18):25–31
- Elvira B (1987) A taxonomic revision of the genus *Chondrostoma* Agassiz, 1835 (Pisces, Cyprinidae). Cybium 11:111–140
- Elvira B (1995) Conservation status of endemic freshwater fish in Spain. Biol Conserv 72:129–136
- Elvira B (1997) Taxonomy of the genus *Chondrostoma* (Osteichthyes, Cyprinidae): an updated review. Folia Zool 46(Suppl 1):1–14
- Elvira B, Almodóvar A (2001) Freshwater fish introductions in Spain: facts and figures at the beginning of the 21st century. J Fish Biol 59(Suppl A):323–331
- Kottelat M (1997) European freshwater fishes. Biologia 52(Suppl 5):1–271
- Smith KG, Darwall WRT (2006) The status and distribution of freshwater fish endemic to the Mediterranean Basin. IUCN, Gland, Switzerland and Cambridge UK, 34 pp