

**BIODIVERSITY OF THE ARAL SEA AND ITS IMPORTANCE  
TO THE POSSIBLE WAYS OF REHABILITATING  
AND CONSERVING ITS REMNANT WATER BODIES**

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**Abstract.** The Aral Sea, despite being the 4th largest lake in the world up to 1960, has now split into six separate water bodies. This break-up and desiccation resulted overwhelmingly from upstream irrigation withdrawals from the two main influent rivers, the Syr Darya and the Amu Darya. The negative effects on both the lake's ecosystem due to declining water level and increasing salinity, as well as the profound socioeconomic and human impacts to the riparian populations are well documented. This paper focuses on the conservation and rehabilitation efforts of the remnant water bodies with a focus on four key areas: the Northern (Small) Aral and its ecosystem; the Southern (Large) Aral and its ecosystem; the delta and deltaic water bodies of the Syr Darya; and the delta and deltaic water bodies of the Amu Darya. It is encouraging to note the reversal of degradation in the Northern Aral after the creation of a dike at Berg's Strait in 1992. The dike washed out in 1999 but has been replaced with a new structurally sound dike. The water level in the Northern Aral has increased several meters and salinity is returning to levels that can sustain the pre-1960 ecosystem. However, much less success has been seen regarding the Southern Aral, which continues its retreat and hypersalinization. There have been recent efforts also in the

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deltas and deltaic regions of the Syr Darya and Amu Darya, with the rehabilitation of Sudochie Lake perhaps being the best known. All of these restoration projects are critiqued in this paper and recommendations for future actions are made.

**Keywords:** Aral Sea, deltaic water bodies, lake basin management, rehabilitation, saline lakes, salinity, osmoregulation

## 1. The Aral Sea and its biodiversity

The Aral Sea was the 4th largest lake in the world by water surface area in 1960. At that time its area was 67,499 km<sup>2</sup> (Large Aral 61,381 km<sup>2</sup>, Small Aral 6,118 km<sup>2</sup>) and volume was 1,089 km<sup>3</sup> (Large Aral 1,007 km<sup>3</sup>, Small Aral 82 km<sup>3</sup>). The Aral Sea was +53.4 m above ocean level with maximum depth 69 m. It was a slightly saline lake with average salinity about 10 g/L.

The Aral Sea was inhabited by about 12 species of fishes and about 160 species of free-living invertebrates excluding Protozoa and small-size Metazoa as listed in Table 1 (Atlas of the Aral Sea invertebrates, 1974).

TABLE 1. Aboriginal fishes and free-living invertebrates in the Aral Sea (Atlas of the Aral Sea invertebrates, 1974).

Species	Type of osmoregulation
Coelenterata	
<i>Protohydra leuckarti</i> Greef, 1970	A3
Turbellaria	
<i>Mecynostomum agile</i> (Beklemishev, 1927)	A3
<i>Macrostomum hystricinum</i> Beklemishev, 1927	A3
<i>M. minimum</i> (Luther, 1947)	A3
<i>Promonotus orientalis</i> Beklemishev, 1927	A3
<i>Kirgisella forcipata</i> Beklemishev, 1927	A3
<i>Gieysztoria bergi</i> (Beklemishev, 1927)	A3
<i>Byrsophlebs geniculata</i> Beklemishev, 1927	A3
<i>Beklemisheviella contorta</i> (Beklemishev, 1927)	A3
<i>Phonorhynchoides flagellatus</i> Beklemishev, 1927	A3
<i>Gyratrix hermaphroditus</i> Ehrenberg, 1831	A3
<i>Pontaralia relictia</i> (Beklemishev, 1927)	A3
<i>Placorhynchus octaculeatus</i> ssp. <i>dimorphis</i> (Karling, 1931)	A3
Nematodes	
<i>Adoncolaimus aralensis</i> Filipjev, 1923	C1
Rotatoria	