

# Paddlefish Culture

## Development Expanding Beyond U.S., Russia, China

### Summary:

Although federal and state hatcheries in the United States produce paddlefish for stock rehabilitation programs, U.S. culture of the species has not been commercialized. Russia and China, however, raise paddlefish for meat and caviar via pond polyculture with carp and reservoir ranching. Further expansion of paddlefish culture is expected in other geographic areas.

Steven D. Mims, Ph.D.  
Aquaculture Research Center  
Kentucky State University  
Frankfort, Kentucky 40601 USA  
smims@dcr.net

The American paddlefish, *Polyodon spathula*, is one of the most valuable native fishes in the United States, and many federal and state hatcheries in the U.S. are producing paddlefish for stock rehabilitation programs. Private culture of paddlefish is primarily at a research and developmental phase, but could provide an alternative source for paddlefish caviar and meat, and also alleviate pressure on capture fisheries.

The paddlefish, which is closely related to sturgeons, is the only member of the family Polyodontidae found on the American continent. The Chinese paddlefish is the only other living species in this family, but it is highly endangered in the Yangtze River of China.

Unlike the fish-eating Chinese paddlefish, American paddlefish are filter feeders that consume zooplankton throughout most of their lives. The filter-feeding nature of this caviar-producing species has made it desirable for introduction to culture in other parts of the world.

### European Development

Paddlefish were first introduced to Eastern Europe in 1974 and 1977 as part of a cooperative scientific effort between the U.S. Fish and Wildlife Service and its former Soviet coun-



Two established farms in the Ukraine stock paddlefish instead of filter-feeding bighead carp in their polyculture systems. Paddlefish were also distributed from Russia to Romania, Moldavia, Ukraine, Hungary, and the Czech Republic.

terpart, Acclimation Department of the All-Union Research Institute of Pond Fisheries. The imported paddlefish eggs, which originated from the state of Missouri, USA, were successfully raised at the Goryachi Klyouch Experimental Fish Breeding Plant located in the Krasnodar region near the Black Sea.

Paddlefish from these introductions provided the first broodstock that successfully reproduced during 1984-1986 in Russia. Since that time, several generations of paddlefish have been obtained, and the biotechnology for paddlefish propagation and rearing has been developed.

According to recent communications, seven hatcheries now carry out artificial propagation of American paddlefish in Russia. Over 10 million fertilized eggs, 7 million swim-up larvae, and 3-4 million advanced larvae are sold annually to producers in Russia and abroad. The center of paddlefish propagation and rearing is still the Krasnodar region. Paddlefish production in Russia has been primarily in pond polyculture with common carp and reservoir ranching.

From Russia, paddlefish have been distributed to other Eastern European countries including Romania, Moldavia, Ukraine, Hungary, and the Czech Republic. Some of these countries have now developed their own broodstock and established hatchery propagation.

In Ukraine, two established farms stock paddlefish instead of filter-feeding bighead carp in their polyculture systems. Last year, Ukraine produced 10 mt of paddlefish, with about 7 mt sold for meat and the remainder carried over for broodstock development and caviar production.

Long-term traditions of sturgeon culture and high demand for fish meat and black caviar have led paddlefish to be well received in the current aquaculture industry in Eastern Europe. These operations, which target high-end markets, have generated great interest in consumers.

### China Polyculture, Ranching

In China, fertilized paddlefish eggs and larvae that originated in Missouri were first introduced in the mid- to



*American paddlefish have been successfully propagated and juvenile paddlefish cultured in Xiantao City, China.*

late 1980s. Currently, 4-5 million fertilized eggs and larvae are imported into China every year from hatcheries in Russia and the United States.

Paddlefish that are polycultured in carp ponds are grown to 1 kg and sold to high-end restaurants. Paddlefish are also cultured for broodstock development and caviar production in connection with reservoir ranching. China recently reported a successful spawning of paddlefish in Hubei Province, the “bread basket” of China. In Xiantao City close to Wuhan, paddlefish have been successfully propagated and juvenile paddlefish cultured.

Paddlefish have been well accepted in high-end restaurants in large Chinese cities. Fish for caviar production are not available, but may be targeted for export markets.

### Further Culture Potential

Information about paddlefish cultivation in other parts of the world is scarce. Recent communications have reported that paddlefish from China have been exported to Cuba, where the fish are grown in reservoirs for future caviar production. Additional information on paddlefish polyculture and reservoir ranching in the U.S. is available at [www.sare.org/publications/factsheet/0705.htm](http://www.sare.org/publications/factsheet/0705.htm).

Further growth of the international paddlefish industry appears promising, with the establishment of broodstock and experience gained in propagation and cultivation techniques in both Eastern Europe and China.