

Bighead, silver, and grass carps are known to have self-sustaining populations in some reservoirs, but it is believed that their spawning and early life history requirements are not met in most such systems. Although these carps, as juveniles or adults, can survive in nearly any reservoir in the United States, reservoirs with tributary rivers that support spawning and survival of early life stages of these fishes are most at risk. Management agencies are justifiably concerned that bait bucket transfer or other vectors might introduce these fishes to important reservoirs, but it remains unclear exactly which reservoirs would support recruitment of these carps through the critical early life stages. This uncertainty makes it impossible to allocate resources appropriately for monitoring and vector deterrence.

We have identified a need for a model that can be applied easily to reservoirs and their tributaries, based on existing locations of introduced self-sustaining populations and on known requirements of the fish. This model should necessarily elucidate the relations between carps' physical-biological requirements and the environmental variables of the reservoir-tributary system such as depths, temperatures, and discharge or surrogate measures. The model will use these relations to identify minimum criteria for developing eggs, migrating to a spawning site, spawning, hatching of eggs in drift, and accessing a nursery habitat. Determination of which criteria are most important to a given reservoir is the next step toward mitigating risk with management actions. This model will be developed with existing available data to make its implementation widely applicable and as cost-effective as possible.