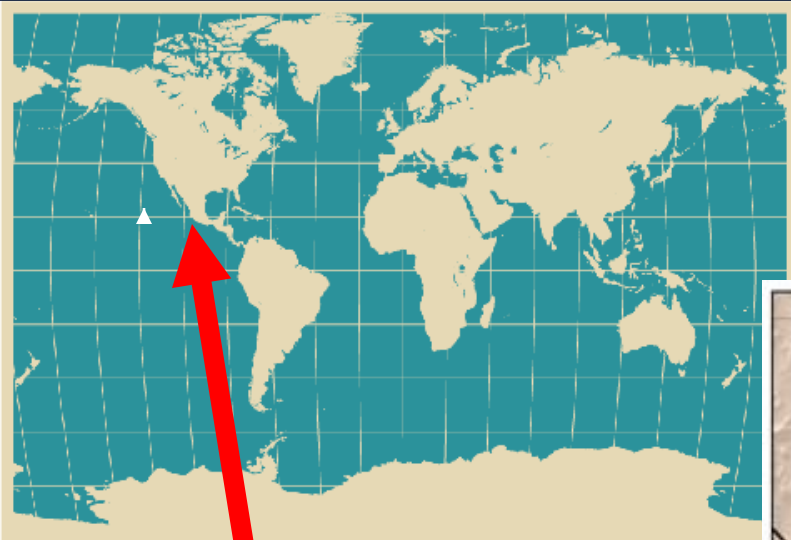


The History of Genetic Biocontrol Agents in the Gila River Basin, New Mexico- Arizona

Paul J. Barrett, Ph.D

U.S. Fish and Wildlife Service





2001 Biological Opinion





Electrofishing

- Began in late 19th Century
- Increased use and development post-WWII



Piscicides

- Indigenous Use for centuries
- Managers began to use in 1930s



Electrofishing and Chemical Renovation

- Target fish avoidance
- Require post shock/kill collection
- May affect non-target species
- Not 100% effective



Timeline

- **1999 – Muir and Howard**
 - Ecological risks of transgenic organisms
- **2004 - CAP research grant to Kapuscinski and Patronski**
 - Ecological
 - Technical
 - Sociological
 - Political

Timeline (Cont.)

- **Phoenix Meeting**
 - **USFWS**
 - **USBR**
 - **AGFD**
 - **NMDFG**
 - **A. Kapuscinski**
 - **W. Muir**
 - **M. Meyers**



Meanwhile Downunder...





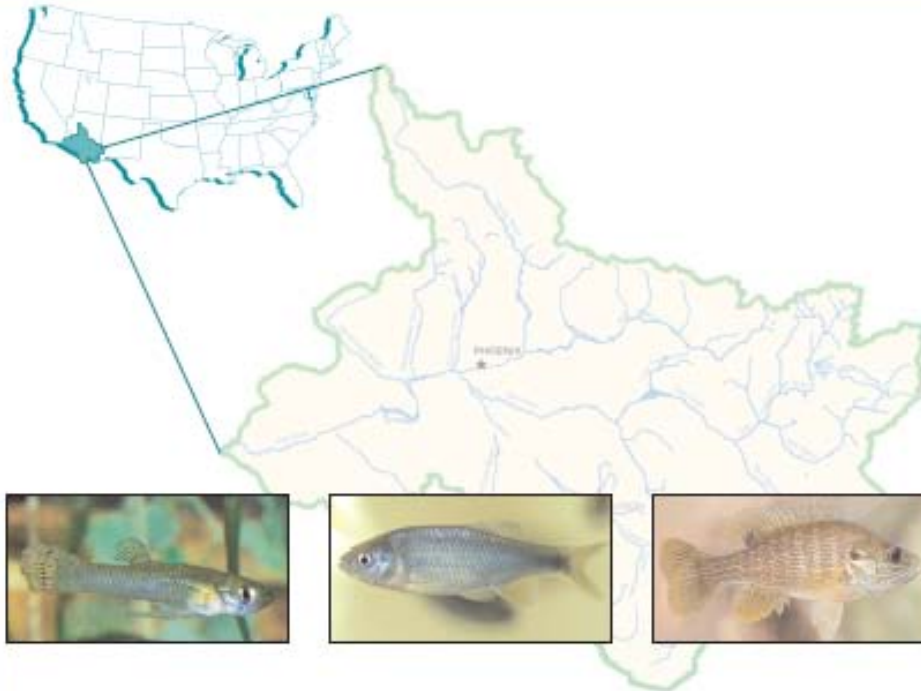
Society for Conservation Biology

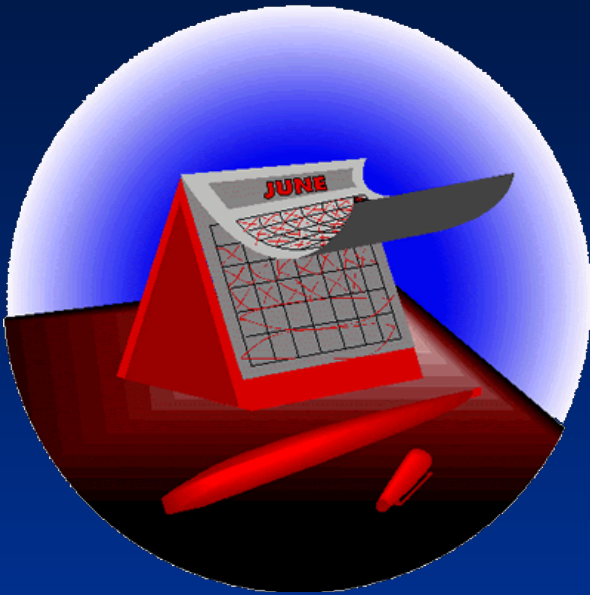


Genetic Methods for Biological Control of Non-Native Fish in the Gila River Basin

Final Report to the U.S. Fish and Wildlife Service

Anne R. Kapuscinski and Timothy J. Patronski





20 Years



\$US 20,000,000



Bighead and Silver Carp WATCH

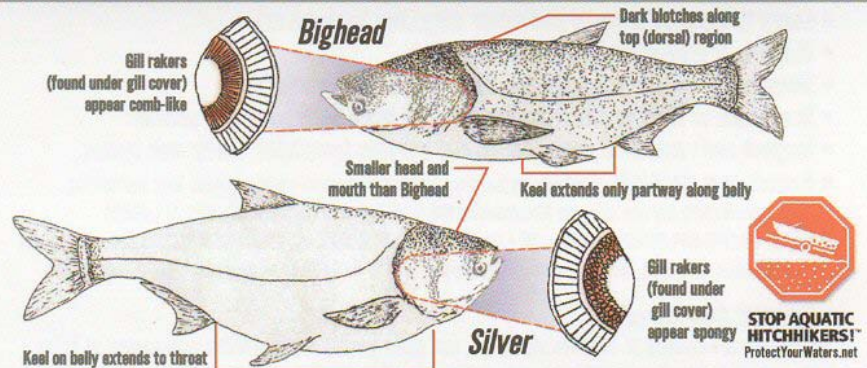
Bighead



Silver



How To Identify Bighead and Silver Carp (adults shown)



General Characteristics

- Low-set eye; large upturned mouth without barbels
- Scaleless head; body scales very small
- Adults may be more than 60 lbs. in weight and 4 ft. in length
- Juveniles difficult to distinguish from local baitfish species
- May jump out of water when disturbed by boat motors

Photos: David Riecks,
UIUC/IL-IN Sea Grant
Illustrations: Martha Kneuer, LMBS/
Illinois Natural History Survey

RISK

Risk is the one factor most people associate with uncertain choices.

- Risk: chance of ‘bad’ things happening
- Risk analysis: estimating the likelihood of uncertain events
- Risk attitude/tolerance: neutral, averse, seeking
- Risk management: deciding what to do about risks
- Public sector risk management involves:
 - Legal or statutory/regulatory mandates
 - Stakeholder values and preferences



