Understanding the Northern Snakehead, *Channa argus*: an impending invasive species

Katie Hietala

Michigan Technological University, Forestry

Applied Ecology and Environmental Studies

http://www.csa.com/discoveryguides/snakehead/overview.php

Background

http://static.panoramio.com/photos/original/1641237.jpg

There are currently twenty eight different species of snakehead, each with different physical adaptations. Although it is considered an invasive in the U.S., the Northern Snakehead is considered a delicacy in Asia, its native region. Rice farming is an important livelihood in China and Korea and many rice farming practices utilize the Northern Snakehead as a food source and as a pest regulator.

Invasive Species

http://www.importclearance.com/full_fuji-city.jpg

Invasive species are the second leading cause of extinctions around the world. The increase in human trade patterns across international borders are allowing plants and animals to expand across natural barriers. This introduction causes damage to ecosystems and threatens native species. Invasive species have the ability to enter an ecosystem, persist and reproduce in a wide range of conditions. The establishment of a population can thrive if there are no native predators to keep the population in check. Fast reproduction rates can out compete native populations for food resources and habitat occupancy. Predation can occur on native species disrupting an already susceptible ecosystem coping with other environmental stresses.

Arrival

The presence of the Northern Snakeheads in the U.S. was first seen in California in 1997. Since then there have been sightings in Florida and Massachusetts but none of these grabbed the media attention like Crofton, Maryland. Juvenile Snakeheads were found in the 2002 "invasion", the young clarified that the snakeheads were a reproducing established population. National and local authorities needed to find out how these invaders got into the U.S. and how to get them out. Because the Northern Snakehead is a delicacy its known that they are sold, dead and alive, through fish markets across international borders. These fish can also be bought and traded among aquarium enthusiasts. This invasive species could have been intentionally released by an overwhelmed owner who was unaware of the consequences. In 2004 a Northern Snakehead was netted near Chicago in Burnham Harbor which is connected to Lake Michigan. There are established populations in the Potomac River and Schuylkill River.

http://www.ulne.com/uploadedImages/ulne/Blogs/Environmentalism/Fish%20Market.JPG

Potential Solutions:

The Northern Snakehead presence in U.S. freshwater systems is driving potential eradication options. The findings of juvenile fish indicate a breeding population, once a population is established it is nearly impossible to irradiate and very expensive. The Northern Snakehead can produce thousands of eggs and spawn multiple times a year in ideal conditions.

http://www.tampagov.net/dept_fire_rescue_public_education/information_resources/adults/poison.asp

Crofton, Maryland: The application of diquat and glyphosphate, two herbicides, were used to lower the oxygen level in an isolated pond (Crofton, Maryland). The low dissolved oxygen content will kill off some fish and vegetation. Because the Snakehead can survive in waters with low D.O. and application of rotenone was applied to poison any remaining organisms.

Positives vs. Negatives

Pros: The toxicity of Rotenone will kill all fish and organisms, even resilient species such as the Northern Snakehead. Rotenone degrades quickly in warm temperatures or can be neutralized.

Cons: The chemicals pollute the water, should only be used in closed systems, kills everything (including native individuals) and requires a restocking to re-establish fishery and vegetation.

Additional Solutions:

One solution will not solve the complex dynamics an invasive species can create in an ecosystem. Multiple solutions may be needed and applied for other areas. Netting programs, electricity shocks, dams, explosives and draining could be used to catch and monitor populations. Raising public knowledge is the most important tool to prevent the invasion of Northern Snakehead and all invasive species.

The Great Lakes

The Department of Natural Resources is working on a rapid response plan. The Great Lakes are similar to the Potomac River and the Schuylkill River, all are parts of interconnected fresh-water ecosystems that are far from the small isolated pond in Maryland and is part of a much larger freshwater reserve. Its unique and valued resources are used by millions of people and need to be protected and considered. Some experts think the faster currents in large rivers and lakes are far from their native stagnant ponds and slow streams that habitat criteria alone will prevent a self-sustaining population.

http://www.xray-mag.com/files/0536.jpg

Myths vs. Facts

The media covered this species like a celebrity. The increase in public awareness will help prevent the spread of invasive species and increase consciousness during recreational activities even though false claims were made.

Myth

- ❑ Northern Snakeheads can walk on land
- ❑ Northern Snakeheads can survive out of water for multiple days
- ❑ Northern Snakeheads eat every other living thing in site

Fact

- ❑ Northern Snakeheads can wiggle through shallow water and in semi-fluid mud, but cannot walk on dry land
- ❑ Northern Snakeheads can breath atmospheric oxygen, but they must remain wet. Drying out will cause death in just a few hours
- ❑ Northern Snakeheads do survive on a wide range of prey sources including fish, invertebrates and potentially small shore birds and mammals, but they will not eat you or your dog

http://i3.ioffer.com/img/itemarchive/153/282/48/1.jpg

Conclusions

- Established populations are very difficult and expensive to eliminate
- Preventing introduction needs to be a top priority
- The establishment of the Northern Snakeheads could result in a decline in other top predators, game fish and prevent the success of restocking programs
- Educating the public on the long term dangers of invasive species and monitoring their presence is the most important defense strategy
- Multiple control methods need to be evaluated to appropriately manage interconnected water systems to ensure the safety of native populations, recreational usage and commercial fishing

References available by request