## A. CURRENT STATUS AND DISTRIBUTION

1. In Wisconsin?  
   - a. YES ☒  NO ☒  
   - b. Abundance: record of the fish in the state, though stocking attempts reported as failed  
   - c. Geographic Range:  
   - d. Type of Waters Invaded (rivers, ponds, lakes, etc): (in other states) vegetated areas of lakes and ponds, lower reaches of slow-moving rivers, backwaters, oxbow lakes  
   - e. Historical Status and Rate of Spread in Wisconsin: Reported in WI in 1895 - fish provided to various applicants. Attempts to stock failed.

2. Invasive in Similar Climate Zones  
   - YES ☒  NO ☒  

3. Similar Habitat Invaded Elsewhere  
   - YES ☒  NO ☒  

4. In Surrounding States  
   - YES ☒  NO ☒  
   - Where: Reports in 39 states, including IL, IN, OH, MI, though there appear to be very few reproducing populations. Most stocking attempts failed.

5. Competitive Ability  
   - High: Can survive a range of temperatures and water quality conditions, is a generalist predator  
   - Low: Very few stocking attempts throughout the US have resulted in reproducing populations

## B. ESTABLISHMENT POTENTIAL AND LIFE HISTORY TRAITS

1. Temperature:  
   - Range: reported to survive at temps. near freezing, but optimal temps. 13 - 30 deg. C

2. Spawning Temperature:  
   - Range: eggs hatch in 3 - 8 days at 22 - 24 deg. C

3. Number of Eggs:  
   - Range: huge variation found: 18,400 - 827,000 eggs per female

4. Preferred Spawning Substrate:  
   - prefer vegetation

5. Hybridization Potential:  
   - no known hybridization with native fish; has been crossed with goldfish, common carp, bighead carp, and rudd

6. Salinity Tolerance  
   - Fresh: ☒  Marine: ☒  Brackish: ☒

7. Oxygen Regime  
   - Range: tolerant of low DO levels, shown to survive in oxygen concentrations less than 1 mg/L

8. Water Hardness Tolerance  
   - Range:
## C. DAMAGE POTENTIAL

<table>
<thead>
<tr>
<th>1. Likelihood of Damage</th>
<th>a. Presence of Natural Enemies:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>b. How well introductory and expansion pathways can be described and quantified: Imported to the US in 1877 and widely distributed - intentional stocking for use as food and sportfish and accidental escapes contributed to presence in the wild</td>
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<tr>
<td>2. Environmental Impacts</td>
<td>a. Alteration of ecosystem composition, structure and function: Unselective generalist invertebrate predator (primarily eats benthic inverts), potential competitor for food with native sportfish and native cyprinids</td>
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<td>c. Damage to ecosystem resilience/sustainability:</td>
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<td>d. Loss of biological diversity:</td>
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<td>e. Abiotic modifications (affects on turbidity, H2O chemistry, etc.): known to stir up bottom sediments - could affect water quality</td>
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<td></td>
<td>f. Biotic effects on other species (loss of cover, nesting sites, forage, changing competitive relationships):</td>
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</tbody>
</table>

## D. NET SOCIO/ECONOMIC IMPACT

<table>
<thead>
<tr>
<th>1. Positive aspects of the species to the economy/society:</th>
<th>Effect: popular orange-yellow variety used in ornamental ponds, originally imported to US for use as food and sportfish</th>
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<tbody>
<tr>
<td>2. Direct and indirect effects of the invasive species:</td>
<td>Effect:</td>
</tr>
<tr>
<td>3. Type of damage caused by organism:</td>
<td>Effect:</td>
</tr>
<tr>
<td>Industries affected by invasive:</td>
<td>Effect:</td>
</tr>
<tr>
<td>4. Loss of aesthetic value affecting recreation and tourism:</td>
<td>Effect:</td>
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<td>5. Increased cost to a sector (monitoring, inspection, control, public education, modifying practices, damage repair, lower yield, loss of export markets due to quarantine:</td>
<td>Effect:</td>
</tr>
<tr>
<td>6. Cost of prevention or control relative to cost of allowing invasion to occur (cost of prevention is borne</td>
<td>Effect:</td>
</tr>
</tbody>
</table>
by different groups than cost of control):

7. Cost at different levels of invasion: Effect:

E. CONTROL AND PREVENTION POTENTIAL

1. Costs of Prevention (including Education):

2. Responsiveness to Prevention Efforts: Unclear how much this species is still used in water gardening, however efforts targeting water gardeners may help to reduce future introductions.

3. Detection Capability:

4. Control Tactics Effective: Mechanical: [ ] Biological: [ ] Chemical: [ ]

5. Efficacy/Feasibility of Control (effort, # of staff):

6. Cost of Control: High: [ ] Medium: [ ] Low: [ ]

7. Non-Target Effects of Control:

8. Threshold at which control would be attempted:

9 Efficacy of Monitoring: