

# Barren's Topminnow Culture

## HACCP Step 1 – Activity Description

| <b>Activity Description</b>                     |                                     |
|---|-------------------------------------|
| Facility: Wolf Creek National Fish Hatchery     | Site: Threatened and Endangered Lab |
| Project Coordinator: Rick Nehrling              | Activity: Barrens topminnow Culture |
| Site Manager: James H. Gray                     |                                     |
| Address: 50 Kendall Road<br>Jamestown, KY 42629 |                                     |
| Phone: 270-343-3797                             |                                     |

| <b>Project Description</b><br>i.e. Who; What; Where; When; How; Why  |
|--|
| <p>Barrens topminnows (BTM) (<i>Fundulus julisia</i>) are a mosquito fish native to the Barrens Plateau region of central Tennessee. Although these fish have not been listed as endangered, they are extremely threatened. Their historic range was comprised of about 15 spring systems. Conservation was begun when this range had dropped to approximately 2-3 spring systems. Wolf Creek National Fish Hatchery became involved in 2001, when we received our first shipment of young BTM's from Conservation Fisheries Inc. (CFI). The fish are held in 300 gallon tanks with 25 micron filters and ultraviolet light filtration. These fish are grown-out for re-introduction into their historic range. Currently, Wolf Creek NFH receives fish from CFI and the Tennessee Aquarium.</p> |

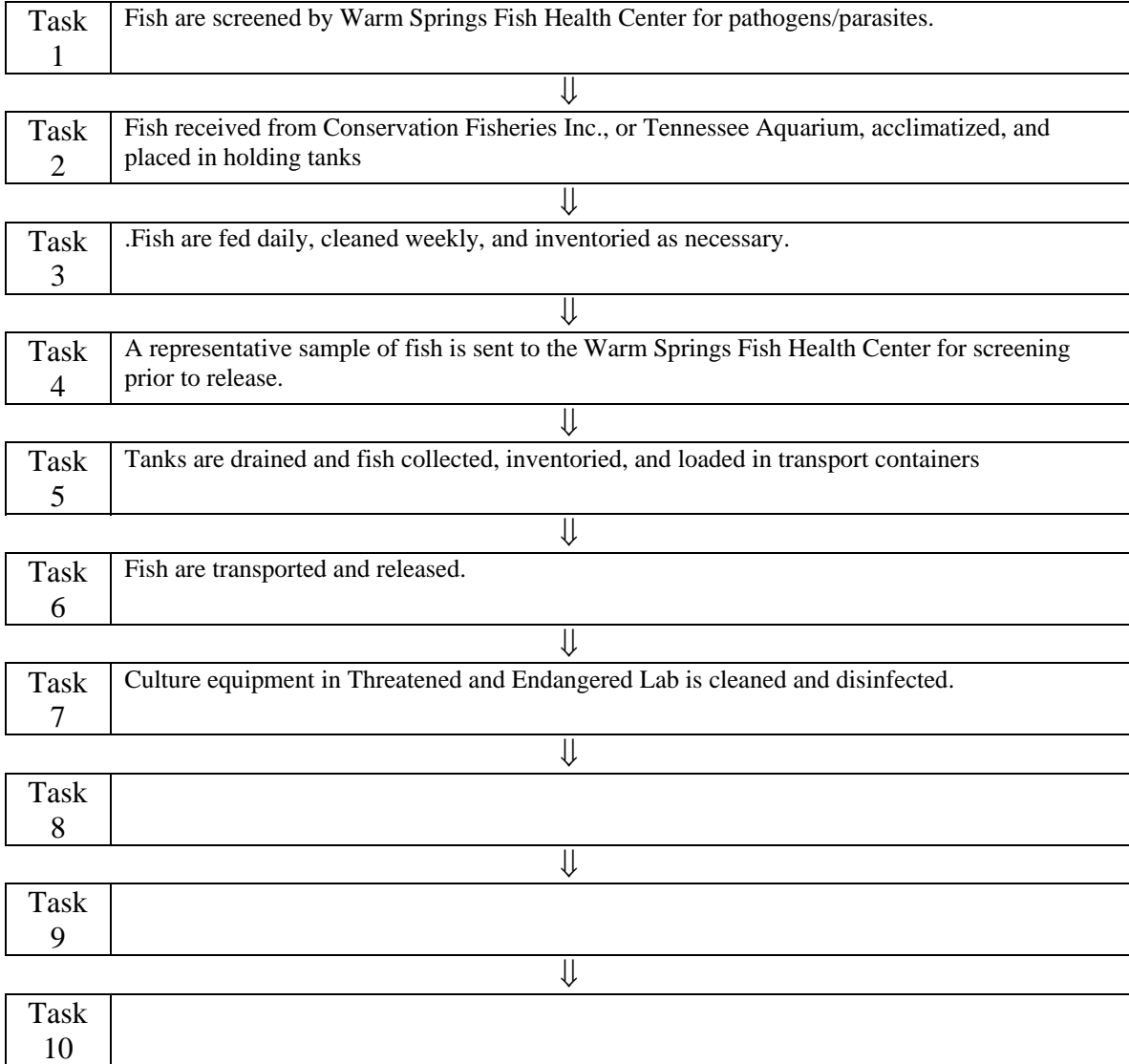
## HACCP Step 2 – Identify Potential Hazards

(to be transferred to column 2 of HACCP Step 4 – Hazard Analysis Worksheet)

| <b>Hazards: Species Which May Potentially Be Moved/Introduced</b>  |
|--|
| <b>Vertebrates:</b><br>None  |
| <b>Invertebrates:</b><br>Zebra mussel ( <i>Dreissena polymorpha</i> )<br>Freshwater snails ( <i>Gastropoda</i> sp.)<br>Asian clam ( <i>Corbicula fluminea</i> )  |
| <b>Plants:</b><br>Eurasian watermilfoil ( <i>Myriophyllum spicatum</i> )<br>Hydrilla ( <i>Hydrilla verticillata</i> )  |
| <b>Other Biologics (e.g. disease, pathogen, parasite):</b><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites commonly associated with salmonid culture<br>Pathogens/Parasites associated with the culture of Endangered fish. |
| <b>Others (e.g. construction materials, etc.):</b><br>None   |

### HACCP Step 3 – Flow Diagram

Flow Diagram Outlining Sequential Tasks to Complete Activity/Project  
Described in HACCP Step 1 – Activity Description



### HACCP Step 4 - Hazard Analysis Worksheet

| 1<br>Tasks<br>(from HACCP Step 3 - Flow Diagram) | 2<br>Potential hazards identified in HACCP Step 2 | 3<br>Are any potential hazards probable? (yes/no) | 4<br>Justify evaluation for column 3 | 5<br>What control measures can be applied to prevent undesirable results? | 6<br>Is this task a critical control point? (yes/no) |
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| Task 1<br><br>Fish are screened by Warm Springs Fish Health Center for pathogens/parasites. | <u>Vertebrates</u><br>None  | No  | No vertebrates in sample   | N/A  | No  |
|   | <u>Invertebrates</u><br>None  | No  | No invertebrates in sample.  | N/A  | No  |
|   | <u>Plants</u><br>None   | No  | No plants in sample.   | N/A  | No  |
|   | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites associated with the culture of Endangered fish | Yes | Pathogens/Parasites can be introduced into the culture facility if not screened. | If Pathogens/Parasites are detected that pose a risk to culture facility or wild population, the fish are not transferred. | Yes |

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| Task 2<br><br>Fish received from Conservation Fisheries Inc., or Tennessee Aquarium, acclimatized, and placed in holding tanks | <u>Vertebrates</u><br>None   | No  | Fish are hand counted at shipping site.  | N/A   | No  |
|  | <u>Invertebrates</u><br>Zebra mussel ( <i>Dreissena polymorpha</i> )<br>Freshwater snails ( <i>Gastropoda</i> sp.)<br>Asian clam ( <i>Corbicula fluminea</i> ) | Yes | Zebra mussels, freshwater snails, Asian clams, and New Zealand mud snails could be transported into the hatchery in a fish shipment. | Acclimatize fish in shipping container, net fish out and place in culture tank. Water and debris from shipping site is discarded. | Yes |
|  | <u>Plants</u><br>Eurasian watermilfoil<br>Hydrilla   | Yes | Pieces of plant material (i.e., Eurasian watermilfoil and Hydrilla) could be transported into the hatchery in a fish shipment.       | Acclimatize fish in shipping container, net fish out and place in culture tank. Water and debris from shipping site is discarded. | Yes |
|  | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites associated with the culture of Endangered fish  | Yes | Fish could be asymptomatic carriers.   | Conduct another disease screening prior to release.   | No  |

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| 1<br>Tasks<br>(from HACCP Step<br>3 - Flow Diagram) | 2<br>Potential hazards<br>identified in<br>HACCP Step 2 | 3<br>Are any potential<br>hazards probable?<br>(yes/no) | 4<br>Justify evaluation<br>for column 3 | 5<br>What control<br>measures can be<br>applied to prevent<br>undesirable results? | 6<br>Is this task a<br>critical control<br>point? (yes/no) |
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| Task 3<br><br>Fish are fed daily,<br>cleaned weekly, and<br>inventoried as<br>necessary. | <u>Vertebrates</u><br>None   | No  | All irrelevant species<br>eradicated in previous step | N/A   | No |
|  | <u>Invertebrates</u><br>None   | No  | All irrelevant species<br>eradicated in previous step | N/A   | No |
|  | <u>Plants</u><br>None  | No  | All irrelevant species<br>eradicated in previous step | N/A   | No |
|  | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites<br>associated with the culture of<br>Endangered fish<br>Pathogens/Parasites<br>commonly associated with<br>salmonid culture | Yes | Fish could be asymptomatic<br>carriers.               | Each tank is outfitted an UV<br>water sterilization system.<br>Chlorinated city water is<br>chemically neutralized to<br>provide tank water. Hand<br>sanitizing before working<br>around tanks. The use of a<br>disinfecting mat to prevent<br>the spread of disease either<br>entering or exiting. The use<br>of certified sterile food. No<br>transfer of water from one<br>tank to another. All<br>nets/equipment are<br>disinfected and allowed to<br>dry. Trout culture equipment<br>and protective wear<br>prohibited from lab. | No |

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| Task 4<br><br>A representative<br>sample of fish is sent to<br>the Warm Springs Fish<br>Health Center for<br>screening prior to<br>release. | <u>Vertebrates</u><br>None   | No  | No vertebrates in sample  | N/A   | No  |
|   | <u>Invertebrates</u><br>None   | No  | No invertebrates in sample.   | N/A   | No  |
|   | <u>Plants</u><br>None  | No  | No plants in sample.  | N/A   | No  |
|   | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites<br>associated with the culture of<br>Endangered fish<br>Pathogens/Parasites<br>commonly associated with<br>salmonid culture | Yes | Pathogens/Parasites can be<br>introduced into the wild<br>population if not screened. | Fish are sent to the Warm<br>Springs FHC for fish<br>pathology screening.<br>Screenings include<br>parasitology, bacteriology,<br>and virology. If the screening<br>is positive and non-<br>indigenous to the stocking<br>site, the fish are not stocked. | Yes |

### HACCP Step 4 - Hazard Analysis Worksheet

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| <b>Task 5</b><br><br>Tanks are drained and fish collected, inventoried, and loaded in transport containers | <u>Vertebrates</u><br>None   | No  | Fish are hand sorted.                | N/A | No |
|  | <u>Invertebrates</u><br>None   | No  | None present in system               | N/A | No |
|  | <u>Plants</u><br>None  | No  | None present in system               | N/A | No |
|  | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites associated with the culture of Endangered fish<br>Pathogens/Parasites commonly associated with salmonid culture | Yes | Fish could be asymptomatic carriers. | N/A | No |

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|---|--|-----|--------------------------------------|-----|----|
| <b>Task 6</b><br><br>Fish transported to stocking site(s) via truck or van. | <u>Vertebrates</u><br>None   | No  | Excluded in previous task.           | N/A | No |
|   | <u>Invertebrates</u><br>None   | No  | Excluded in previous task.           | N/A | No |
|   | <u>Plants</u><br>None  | No  | Excluded in previous task.           | N/A | No |
|   | <u>Others</u><br>Dactylogyrus sp.<br>Hexamita sp.<br>Pathogens/Parasites associated with the culture of Endangered fish<br>Pathogens/Parasites commonly associated with salmonid culture | Yes | Fish could be asymptomatic carriers. | N/A | No |

### HACCP Step 4 - Hazard Analysis Worksheet

| 1<br>Tasks<br>(from HACCP Step<br>3 - Flow Diagram) | 2<br>Potential hazards<br>identified in<br>HACCP Step 2 | 3<br>Are any potential<br>hazards probable?<br>(yes/no) | 4<br>Justify evaluation<br>for column 3 | 5<br>What control<br>measures can be<br>applied to prevent<br>undesirable results? | 6<br>Is this task a<br>critical control<br>point? (yes/no) |
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| <b>Task 7</b><br><br>Culture equipment in<br>Threatened and<br>Endangered Lab is<br>cleaned and<br>disinfected. | <u>Vertebrates</u><br>None  | No  | None present in system                         | N/A  | No  |
|   | <u>Invertebrates</u><br>None  | No  | None present in system                         | N/A  | No  |
|   | <u>Plants</u><br>None   | No  | None present in system                         | N/A  | No  |
|   | <u>Others</u><br>Dactylogyus sp.<br>Hexamita sp.<br>Pathogens/Parasites<br>associated with the culture of<br>Endangered fish<br>Pathogens/Parasites<br>commonly associated with<br>salmonid culture | Yes | Contaminated water, cover<br>mops, and gravel. | Grow out tanks are<br>completely disassembled.<br>Hoses, gravel, tank, mops,<br>and canister filters are<br>topically treated with a 10%<br>bleach solution and<br>scrubbed/submerged to<br>achieve sterile equipment. | Yes |

**HACCP Step 5 – HACCP Plan Form**

**HACCP Plan Form**

| <b>Monitoring</b>  |  |   |  |                                    |                               |                                     |   |  |
|--|--|---|--|------------------------------------|-------------------------------|-------------------------------------|---|--|
| <b>Critical Control Point (CCP)</b>  | <b>Significant Hazard(s)</b>   | <b>Limits for each Control Measure</b>                                | <b>What</b>                                  | <b>How</b>                         | <b>Frequency</b>              | <b>Who</b>                          | <b>Evaluation &amp; Corrective Action(s) (if needed)</b>  | <b>Supporting Documentation (if any)</b> |
| (1) Fish are screened by Warm Springs Fish Health Center for pathogens/parasites.                                    | Spread of pathogens or parasites into the hatchery.  | Approximately 5 fish are sent to the Warm Springs Fish Health Center. | Fish pathogens or parasites                  | Visual and microscopic inspection. | Before the fish are shipped.  | Warm Springs Fish Health Center, GA | Detection of a pathogen that could cause an epizootic in capture populations would prohibit transfer to rearing station.    | Fish Health Inspection Report            |
| (2) Fish received from Conservation Fisheries Inc., or Tennessee Aquarium, acclimatized, and placed in holding tanks | Spread of zebra mussels, freshwater snails, Asian clams, eurasiaan watermilfoil, hydrilla, dactylogyrus sp., hexamita sp., and pathogens/parasites commonly associated with the culture of endangered fish into the rearing station. | Zero Tolerance  | ANS species, and fish pathogens or parasites | Visual                             | Each time fish are received.  | Hatchery staff.                     | All hatchery staff maintains imperiled fish culture procedures.   | Fish transfer record, and data log book. |
| (4) A representative sample of fish is sent to the Warm Springs Fish Health Center for screening prior to release.   | Spread of pathogens or parasites into the wild.  | Approximately 5 fish are sent to the Warm Springs Fish Health Center. | Fish pathogens or parasites                  | Visual and microscopic inspection. | Before the fish are stocked.  | Warm Springs Fish Health Center, GA | Detection of a pathogen that could cause an epizootic in wild populations would prohibit stocking.                          | Fish Health Inspection Report            |
| (7) Culture equipment in Threatened and Endangered Lab is cleaned and disinfected.                                   | dactylogyrus sp., hexamita sp., and pathogens/parasites commonly associated with the culture of endangered fish, pathogens/parasites commonly associated with salmonid culture   | Zero Tolerance  | Disinfection procedures                      | Visual, and timed                  | When a system is taken apart. | Hatchery staff.                     | Fishery Biologist in charge of the threatened and endangered species lab ensures that disinfection procedures are followed. | Data log book                            |
| <b>Facility:</b>   | Wolf Creek National Fish Hatchery  |   |  |                                    |                               | <b>Activity:</b>                    | Barren's Topminnow Culture  |  |
| <b>Address:</b>  | 50 Kendall Road<br>Jamestown, KY 42629   |   |  |                                    |                               |                                     |   |  |
| <b>Signature:</b>  |  |   |  |                                    |                               | <b>Date:</b>                        |   |  |

|                                 |  |
|---------------------------------|--|
| <b>HACCP Plan was followed.</b> |  |
|---------------------------------|--|