

HACCP (Hazard Analysis and Critical Control Point) Plan

San Marcos salamander *Eurycea nana*

Modified on 4-Feb-04

1. Product Description
2. Flow Diagram
3. Potential Hazards
4. Hazard Analysis Worksheet
5. HACCP Plan Form

1. Product Description

| | |
|---|---|
| Firm Name: | San Marcos National Fish Hatchery and Technology Center |
| Firm Address: | 500 East McCarty Lane San Marcos, Texas 78666 |
| Species: | San Marcos salamander (<i>Eurycea nana</i>) |
| Cultured, wild-harvested, or both: | wild-harvested |
| Harvest method: | dipnet and netting over spring openings |
| Method of storage: | flow-through units supplied with water directly from the Edward's Aquifer |
| Intended use and consumer: | refugium |

2. Flow Diagram

| | |
|--------|---|
| Step 1 | San Marcos salamanders are collected as needed from San Marcos River headwaters |
| Step 2 | salamanders are transported in a container, filled with San Marcos River or Edwards Aquifer water, to the Test-Pad at NFHTC |
| Step 3 | salamanders are placed in flow-through quarantine tanks, are fed "clean" food, and are examined for ANS at least every 3 days |
| Step 4 | after at least 2 weeks of quarantine, salamanders are moved into the refugium systems |
| Step 5 | |
| Step 6 | |

3. Potential Aquatic Nuisance Species (ANS) Hazards

List aquatic species here that are found in hatchery water supply or local waters that could potentially hitchhike to receiving waters and cause ecological harm.

Vertebrates armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles
Invertebrates *Melanoides tuberculata* , *Thiara granifera* , crayfish, various parasites
Plants *Hydrilla* , *Hygrophila* , water hyacinth

4. Hazard Analysis Worksheet

| (1) Harvest or Aquaculture Step | (2) Identify potential ANS hazards introduced or controlled | | (3) Are any hazards significant? | (4) Justify your decisions for column 3 | (5) What control measures can be applied to prevent the hazards? | (6) Is this step a critical control point? |
|---|---|---|---|--|---|---|
| San Marcos salamanders are collected as needed from San Marcos River headwaters | vertebrates | armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles | yes | ANS are present in the San Marcos River | manually remove ANS from collection at site | yes |
| | invertebrates | Melanoides tuberculata, Thiara granifera, crayfish, various parasites | yes | ANS are present in the San Marcos River | manually remove ANS from collection at site | yes |
| | plants | Hydrilla, Hygrophila, water hyacinth | yes | ANS are present in the San Marcos River | manually remove ANS from collection at site | yes |
| salamanders are transported in a container, filled with San Marcos River or Edwards Aquifer water, to the Test-Pad at NFHTC | vertebrates | armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles | no | ANS not present | not needed | no |
| | invertebrates | Melanoides tuberculata, Thiara granifera, crayfish, various parasites | yes | ANS may be transferred from net into quarantine tank | frequent observation during quarantine and removal of ANS | yes |
| | plants | Hydrilla, Hygrophila, water hyacinth | yes | ANS may be transferred from net into quarantine tank | frequent observation during quarantine and removal of ANS | yes |
| salamanders are placed in flow-through quarantine tanks, are fed "clean" food, and are examined for ANS at least every 3 days | vertebrates | armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles | no | ANS not present | ANS becomes more noticeable as develop and are removed during quarantine process | no |
| | invertebrates | Melanoides tuberculata, Thiara granifera, crayfish, various parasites | yes | ANS may be transferred from net into quarantine tank | ANS becomes more noticeable as develop and are removed during quarantine process | yes |
| | plants | Hydrilla, Hygrophila, water hyacinth | yes | ANS may be transferred from net into quarantine tank | ANS becomes more noticeable as develop and are removed during quarantine process | yes |

4. Hazard Analysis Worksheet

| (1) Harvest or Aquaculture Step | (2) Identify potential ANS hazards introduced or controlled | | (3) Are any hazards significant? | (4) Justify your decisions for column 3 | (5) What control measures can be applied to prevent the hazards? | (6) Is this step a critical control point? |
|---|---|--|---|---|---|---|
| after at least 2 weeks of quarantine, salamanders are moved into the refugium systems | vertebrates | armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles | no | Control of ANS hazard completed | Not needed | no |
| | invertebrates | Melanoides tuberculata, Thiara granifera, crayfish, various parasites | no | Control of ANS hazard completed | Not needed | no |
| | plants | Hydrilla, Hygrophila, water hyacinth | no | Control of ANS hazard completed | Not needed | no |
| | vertebrates | | | | | |
| | invertebrates | | | | | |
| | plants | | | | | |
| | vertebrates | | | | | |
| | invertebrates | | | | | |
| | plants | | | | | |

