

## HACCP (Hazard Analysis and Critical Control Point) Plan

aquatic moss *Amblystegium riparium*

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

<b>Firm Name:</b>	San Marcos National Fish Hatchery and Technology Center
<b>Firm Address:</b>	500 East McCarty Lane San Marcos, Texas 78666
<b>Species:</b>	aquatic moss ( <i>Amblystegium riparium</i> )
<b>Cultured, wild-harvested, or both:</b>	wild-harvested
<b>Harvest method:</b>	dipnet and by hand
<b>Method of storage:</b>	flow-through units supplied with water directly from the Edward's Aquifer
<b>Intended use and consumer:</b>	substrate for shelter and egg deposition in the refugia for listed species of salamanders

## 2. Flow Diagram

Step 1	moss is collected as needed from Spring Lake (San Marcos River headwaters) via dip-nets and by hand and carefully searched in large shallow tray removing any other species present (esp. the protected fountain darter and San Marcos salamander)
Step 2	moss is transported in an ice chest filled with river water to the pad at NFHTC where it is dipped in Roccal (50% AI) solution (6ml/L) placed by hand into a flow-through quarantine tank
Step 3	quarantine tank is checked every 3 days for presence of other species (e.g. fish, salamanders, crayfish, bladderwort) which are removed
Step 4	after at least 4 weeks of quarantine, moss is available for use in salamander 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.

<b>Vertebrates</b>	armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles
<b>Invertebrates</b>	<i>Melanoides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites
<b>Plants</b>	<i>Hydrilla</i> , <i>Hygrophila</i> , 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?
moss is collected as needed from Spring Lake (San Marcos River headwaters) via dip-nets and by hand and carefully searched in large shallow tray removing any other species present (esp. the protected fountain darter and San Marcos salamander)	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
moss is transported in an ice chest filled with river water to the pad at NFHTC where it is dipped in Roccal (50% AI) solution (6ml/L) placed by hand into a flow-through quarantine tank	vertebrates	armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	yes	young could be overlooked during sorting	disinfected before quarantined	yes
	invertebrates	Melanoides tuberculata, Thiara granifera, crayfish, various parasites	yes	small organisms could be overlooked during sorting	disinfected before quarantined	yes
	plants	Hydrilla, Hygrophila, water hyacinth	yes	small plants/sections could be overlooked during sorting	disinfected before quarantined	yes
quarantine tank is checked every 3 days for presence of other species (e.g. fish, salamanders, crayfish, bladderwort) which are removed	vertebrates	armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	no	young should be killed by disinfection	ANS becomes more noticeable as develop and are removed during quarantine process	no
	invertebrates	Melanoides tuberculata, Thiara granifera, crayfish, various parasites	yes	some organisms could survive disinfection	ANS becomes more noticeable as develop and are removed during quarantine process	yes
	plants	Hydrilla, Hygrophila, water hyacinth	yes	some organisms could survive disinfection	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 4 weeks of quarantine, moss is available for use in salamander 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					





































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