

# Texas Wildrice (*Zizania texana*) HACCP Plan

(Hazard Analysis and Critical Control Point)

## Uvalde National Fish Hatchery Texas Wildrice Refugium

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

### HACCP Step 1 - Activity Description

Facility: Uvalde National Fish Hatchery	Site: Fountain Darter Pad
Project Coordinator: Ron Twibell	Activity: Threatened & Endangered Species Recovery
Site Manager: Jae Ahn	
Address: 754 County Road 203 Uvalde, TX 78801	
Phone: 830-278-2419	

<p><b>Project Description</b> i.e. Who; What; Where; When; How; Why</p>
<p>Uvalde National Fish Hatchery has the responsibility of maintaining a standing stock of Texas wildrice (<i>Zizania texana</i>) as described by the San Marcos/Comal/Edwards Aquifer Rare, Threatened, and Endangered Species Contingency Plan. Texas wildrice plants are collected from the San Marcos River and quarantined at the San Marcos National Fish Hatchery &amp; Technology Center (SMNFHTC). Following the quarantine period at SMNFHTC, Texas wildrice plants may be transported to Uvalde National Fish Hatchery and maintained in flow-through raceways. The project is ongoing.</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>
<p><b>Vertebrates:</b> List Species/Types: armored cat fishes, mosquito fish, various aquarium-trade fishes, tadpoles, fountain darters</p>
<p><b>Invertebrates:</b> List Species/Types: crayfish, <i>Melanoides tuberculata</i> (snail), <i>Thiara granifera</i> (snail)</p>
<p><b>Plants:</b> List Species/Types: Hydrilla verticellata, Hygrophila, Polysperma, Cryptocoryna Comments:</p>
<p><b>Other Biologics</b> (e.g. disease, pathogen, parasite): List Species/Types: various parasites Comments</p>
<p><b>Others</b> (e.g. construction materials, etc.): List Other Hazards: None Comments:</p>

### HACCP Step 3 - Flow Diagram

Flow Diagram Outlining Sequential Tasks to Complete Activity/Project Described in HACCP Step 1 - Activity Description (to be transferred to column 1 of the HACCP Step 4 - Hazard Analysis Worksheet)

Task 1	Texas wildrice is collected as needed from the San Marcos River in conjunction with personnel familiar with the Texas Parks and Wildlife Department (TPWD) naming system. Individual tillers with well developed root systems are cut from the parent plant and carefully inspected for attached snails and any other species present (esp. the protected fountain darter and San Marcos salamander). All visible organisms are removed.
Task 2	Dip nets, ice chests, and other equipment are removed from the river.
Task 3	Texas wildrice is transported in an ice chest filled with river water to the greenhouse at SMNFHTC where it is dipped in Roccal (50% AI) solution (6ml/L), then placed by hand into a flow-through quarantine tank.
Task 4	Quarantine tank is checked every 3 days for presence of other species (e.g. snails, fish, salamanders, crayfish, bladderwort), which are removed.
Task 5	After four weeks of quarantine, Texas wildrice is ready for potting and placement in flow-through tanks in the greenhouse at SMNFHTC.
Task 6	Required numbers of Texas wildrice plants are transported in ice chests filled with water to Uvalde NFH where they are quarantined for a period of four weeks.
Task 7	Texas wildrice plants are maintained in flow-through raceways at Uvalde NFH.

### HACCP Step 4 - Hazard Analysis Worksheet

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (Yes/No)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (Yes/No)
Task 1  Texas wildrice is collected as needed from the San Marcos River in conjunction with TPWD naming system. Individual tillers with well developed root systems are cut from the parent plant and carefully inspected for attached ANS.	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	yes	ANS are present in San Marcos River	manually remove visible ANS from collection at site	yes
	Invertebrates: <i>Melanoides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	yes	ANS are present in San Marcos River	manually remove visible ANS from collection at site	yes
	Plants: Hydrilla verticillata, Hygrophila, water hyacinth	yes	ANS are present in San Marcos River	manually remove visible ANS from collection at site	yes
	Others: N/A	N/A	N/A	N/A	N/A
Task 2  Dip nets, ice chests, and other equipment are removed from the river	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	yes	ANS are present in San Marcos River	manually remove visible ANS and dip all equipment in 600 mg/L Roccal solution	yes
	Invertebrates: <i>Melanoides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	yes	ANS are present in San Marcos River	manually remove visible ANS and dip all equipment in 600 mg/L Roccal solution	yes
	Plants: Hydrilla, Hygrophila, water hyacinth	yes	ANS are present in San Marcos River	manually remove visible ANS and dip all equipment in 600 mg/L Roccal solution	yes
	Others: N/A	N/A	N/A	N/A	N/A

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (Yes/No)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (Yes/No)
Task 3  Texas wildrice is transported in an ice chest filled with river water to the greenhouse at SMNFHTC where it is dipped in Roccal (50% AI) solution (6ml/L), then 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: <i>Melanoides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	yes	small organisms could be overlooked during sorting	disinfected before quarantined	yes
	Plant: <i>Hydrilla verticellata</i> , <i>Hygrophila</i> , <i>polysperma</i> , <i>Cryptocoryne</i>	yes	small plants/sections could be overlooked during sorting	disinfected before quarantined	yes
	Others: N/A	N/A	N/A	N/A	N/A
Task 4  Quarantine tank is checked every 3 days for presence of other species (e.g. snails, fish, salamanders, crayfish, bladderwort), which are removed	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	no	young should be killed by disinfection	ANS become more noticeable as develop and are removed during quarantine process	no
	Invertebrates: <i>Melanoides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	yes	some organisms could survive disinfection	ANS become more noticeable as develop and are removed during quarantine process	yes
	Plants: <i>Hydrilla verticellata</i> , <i>Hygrophila</i> , water hyacinth	yes	some organisms could survive disinfection	ANS become more noticeable as develop and are removed during quarantine process	yes
	Others: N/A	N/A	N/A	N/A	N/A

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Task 5  After four-week quarantine period, Texas wildrice is ready for potting and placement in flow-through tanks in the greenhouse at SMNFHTC	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	no	Control of ANS hazard completed	not needed	no
	Invertebrates: <i>Melano ides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	no	Control of ANS hazard completed	not needed	no
	Plants: Hydrilla verticellata, Hygrophila, water hyacinth	no	Control of ANS hazard completed	not needed	no
	Others: N/A	N/A	N/A	N/A	N/A
Task 6  Required numbers of Texas wildrice plants are transported in ice chests filled with water to Uvalde NFH and placed in flow-through quarantine tanks for a minimum of four weeks .	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	no	ANS control complete	not needed	no
	Invertebrates: <i>Melano ides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	no	ANS control complete	not needed	no
	Plants: Hydrilla, Hygrophila, water hyacinth	no	ANS control complete	not needed	no
	Others: N/A	N/A	N/A	N/A	N/A
Task 7  Texas wildrice plants are maintained in flow-through raceways at Uvalde NFH	Vertebrates: armored catfishes, mosquitofish, various aquarium-trade fishes, tadpoles	no	ANS control complete	not needed	no
	Invertebrates: <i>Melano ides tuberculata</i> , <i>Thiara granifera</i> , crayfish, various parasites	no	ANS control complete	not needed	no

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards probable? (Yes/No)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (Yes/No)
	Plants: Hydrilla, Hygrophila, water hyacinth	no	ANS control complete	not needed	no
	Other: N/A	N/A	N/A	N/A	N/A

## HACCP Step 5 - HACCP Plan Form

### Section 1.01 HACCP Plan Form

(all CCP s or yes answers from column 6 of HACCP Step 4 - Hazard Analysis Worksheet)

Critical Control Point (CCP)	Significant Hazard(s)	Article III. Limits for Each Control Measure	Article II. Monitoring				Evaluation & Corrective Actions(s) (if needed)	(9) Records	(10) Verification
			What	How	Frequency	Who			
dip nets, ice chests, and other equipment are removed from the river	Vertebrates, invertebrates plants, pathogenic organisms	remove ANS hazards by hand and dip all equipment in 600 mg/L Roccal solution	presence of ANS hazards	visual inspection of equipment	before, during and after use of equipment	hatchery and field personnel	remove ANS by hand	record day of inspection, observations, and actions	records to be reviewed by hatchery manager to verify that ANS control measures are being done
Texas wildrice is transported in a container, filled with San Marcos River water, to the Test-Pad at SMNFHTC, and is dipped in Roccal (50%AI) solution (6ml/L), and placed into a flow-through quarantine	vertebrates invertebrates plants	pick out ANS hazards by hand and dip all equipment in 600 mg/L Roccal solution	presence of ANS hazards	visual inspection of moss and equipment	before, during, and after use of the equipment	hatchery personnel	remove ANS by hand	record day of inspection, observations, and actions	records to be reviewed by hatchery manager to verify that ANS control measures are being done

quarantine tank(s) is/are checked every 3 days for presence of ANS for at least 2 weeks	vertebrates invertebrates plants	pick out ANS hazards	presence of ANS hazards	visual inspection of quarantine tank	every 3 days	hatchery employee	If ANS are frequently noticed, then extend quarantine until ANS completely removed	record presence of ANS and final day of quarantine	records to be reviewed by hatchery manager to verify that ANS control measures are being done
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