

Comanche Springs Pupfish (*Cyprinodon elegans*) HACCP Plan (Hazard Analysis and Critical Control Point)

Uvalde National Fish Hatchery Comanche Springs Pup fish Refugium

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2. Potential Hazards
3. Flow Diagram
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HACCP Step 1 - Activity Description

Facility: Uvalde National Fish Hatchery	Site: two, 0.5 acre earthen ponds
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>Project Description i.e. Who; What; Where; When; How; Why</p>
<p>Uvalde National Fish Hatchery provides a refugium for the federally endangered Comanche Springs pupfish, <i>Cyprinodon elegans</i>. Comanche Springs pupfish are maintained year round in 0.5 acre earthen ponds at the station. The project is ongoing.</p>

HACCP Step 2 - Identify Potential Hazards
(to be transferred to column 2 of HACCP Step 4 - Hazard Analysis Worksheet)

Hazards: Species Which May Potentially Be Moved/Introduced
Vertebrates: List Species/Types: sheephead minnow, green sunfish, Mexican tetra, mosquitofish
Invertebrates: List Species/Types: Various aquatic snails, crayfish
Plants: List Species/Types: water star thistle, hydrilla, water hyacinth Comments:
Other Biologics (e.g. disease, pathogen, parasite): List Species/Types: Various pathogenic or parasitic internal or external organisms
Others (e.g. construction materials, etc.): List Other Hazards: N/A Comments:

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)

Step 1	fish are transported to Uvalde NFH from another facility or from the wild
Step 2	fish are treated for external parasites with a formalin bath, then stocked into a recirculation system (quarantine)
Step 3	transport coolers, dip nets, and other equipment are inspected and ANS removed manually. All equipment is then disinfected in quaternary ammonium chloride solution.
Step 4	for a two-week period, quarantined fish are observed daily for signs of disease
Step 5	following the quarantine period, fish are transported to earthen ponds at the station where they will remain year round

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 fish are transported to Uvalde NFH from another facility or from the wild	Vertebrates: sheepshead minnow, green sunfish, Mexican tetra, mosquitofish	yes	ANS are present in Comanche Springs pupfish habitat and may be present at other rearing facilities	manually remove visible ANS from transport containers prior to unloading fish at Uvalde NFH	yes
	Invertebrates: crayfish, snails, various parasites	yes	ANS are present in Comanche Springs pupfish habitat and may be present at other rearing facilities	manually remove visible ANS from transport containers prior to unloading fish at Uvalde NFH	yes
	Plants: water star thistle, hydrilla, water hyacinth	yes	ANS are present in Comanche Springs pupfish habitat and may be present at other rearing facilities	manually remove visible ANS from transport containers prior to unloading fish at Uvalde NFH	yes
	Others: N/A	N/A	N/A	N/A	N/A
Task 2 fish are treated for external parasites (200 mg/l formalin bath) in transport container, then stocked into recirculation system (for quarantine)	Vertebrates: sheepshead minnow, green sunfish, Mexican tetra, mosquitofish	no	ANS control completed in step 1	ANS control occurs in step 1	no
	Invertebrates: crayfish, snails, various parasites	yes	external parasites may be present on fish and/or in transport water	formalin bath should kill all external and free parasites	yes
	Plants: water star thistle, hydrilla, water hyacinth	no	ANS control completed in step 1	ANS control occurs in step 1	no
	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 transport coolers, dip nets and other equipment are inspected and ANS removed manually. All equipment is then disinfected in quaternary ammonium chloride solution.	Vertebrates: sheephead minnow, green sunfish, Mexican tetra, mosquitofish.	No	ANS control complete	ANS control completed in step 1	no
	Invertebrates: crayfish, snails, various parasites	yes	ANS may be present on equipment	treat all equipment in 2 mg/l bath of quaternary ammonium chloride	yes
	Plants: water star thistle, hydrilla, water hyacinth	no	ANS control completed	ANS control occurs in step 1	no
	Others: N/A	N/A	N/A	N/A	N/A
Task 4 for a two week period, quarantined fish are observed daily for signs of disease	Vertebrates: sheephead minnow, green sunfish, Mexican tetra, mosquitofish	no	ANS control completed	not needed	no
	Invertebrates: crayfish, snails, various parasites	yes	fish may harbor residual parasites or pathogenic organisms	extend quarantine period, send sample of fish to Pinetop FHC and/or retreat with formalin as needed	yes
	Plants: water star thistle, hydrilla, water hyacinth	no	ANS control completed	N/A	no
	Others: N/A	N/A	N/A	N/A	N/A
Task 5 following the quarantine period, fish are transported to earthen ponds at the station where they will remain year round	Vertebrates: sheephead minnow, green sunfish, Mexican tetra, mosquitofish	no	control of ANS hazard completed	N/A	no
	Invertebrates: crayfish, snails, various parasites	no	control of ANS hazard completed	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: water star thistle, hydrilla, water hyacinth	no	control of ANS hazard completed	none	no
	Others: 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			
fish are transported to the station from another facility or from the wild	Vertebrates, invertebrates plants, pathogenic organisms	inspect nets, waders, transport coolers for all visible ANS	presence of ANS hazards	visual inspection of equipment	before, during and after use of equipment	hatchery personnel	re-inspect equipment and remove any remaining ANS prior to leaving collection site	record control measures on collection data sheets	Hatchery Manager to review records and ensure that measures are followed
fish are treated for external parasites (200 mg/l formalin bath) in transport container, then stocked into recirculation system (for quarantine)	parasites and pathogenic organisms	treat pupfish in transport coolers with 200 mg/l formalin solution	presence of ANS hazards	formalin treatment	one time, upon arrival of fish at station	hatchery personnel	retreat with formalin if signs of external parasites persist (e.g. flashing)	record control measures on collection data sheet	Hatchery Manager to review records and ensure that measures are taken

transport coolers, dip nets, and other equipment are inspected and ANS removed manually. All equipment is then disinfected in quaternary ammonium chloride solution	vertebrates invertebrates plants	manually remove visible ANS hazards and disinfect all equipment with quaternary ammonium chloride solution	presence of ANS hazards	inspect and clean equipment, and disinfect in quaternary ammonium chloride solution	upon arrival of fish at station	hatchery personnel	repeat cleaning and disinfecting procedures if necessary	record control measures on collection data sheet	Hatchery Manager to review records and ensure that control measures are completed
for a two-week period, quarantined fish are observed daily for signs of disease	pathogenic organisms and external parasites	quarantine fish for two weeks	presence of ANS hazard	observe quarantined pupfish for signs of disease	daily for a period of two weeks	hatchery personnel	if signs of disease are observed, send sample of fish to Pinetop FHC for testing and/or retreat fish	record control measures on collection data sheet	Hatchery Manager to review record and ensure control measures are taken