

HACCP Step 1 – Activity Description

Activity Description	
Facility: Tishomingo National Fish Hatchery	Site: Tishomingo National Fish Hatchery
Project Coordinator: Kerry Graves	Activity: Paddlefish Production
Site Manager: Kerry Graves	
Address: 5503 W. Hwy 7 Tishomingo, OK 74530	
Phone: (580) 384-5463	

Project Description

i.e. Who; What; Where; When; How; Why

The Tishomingo National Fish Hatchery (TNFH) raises and stocks paddlefish into various lakes and rivers in Oklahoma and Texas for paddlefish restoration purposes. The TNFH also cultures paddlefish for the Kansas Department of Wildlife and Parks (KDWP). The TNFH has an ongoing partnership with the Arkansas Game and Fish Commission (AGFC), Inks Dam National Fish Hatchery (IDNFH), Natchitoches National Fish Hatchery (NNFH), Oklahoma Department of Wildlife Conservation (ODWC), and the Oklahoma Fishery Resources Office (OKFRO) to meet paddlefish production and stocking commitments. Paddlefish broodfish are collected by the AGFC, ODWC and OKFRO at various locations in the Red and Arkansas River drainages. Red River paddlefish are spawned at NNFH and TNFH. Arkansas River paddlefish are spawned at TNFH only. After the spawning season broodfish are jaw tagged and returned in a fish distribution tank to their capture location. A number of Red River paddlefish fry are transported to IDNFH for culture and returned to the TNFH for stocking during late summer.

Paddlefish fry are reared in 10 foot raceways and eight foot circular tanks in two holding houses. As the paddlefish grow they are separated into smaller groups and eventually moved outside to four, 145 foot covered raceways and six covered 20 foot circular tanks. The primary water source at TNFH is from Pennington Creek. Creek water is piped to all raceways, tanks and ponds from a gravity fed diversion canal. Occasionally well water is used when creek water temperatures are too warm or too cold. Paddlefish are raised on pellet feed until they reach 12 inches in length. Paddlefish are coded wire tagged in the rostrum and stocked into various lakes and rivers in Oklahoma. The KDWP picks up a portion of the tagged Arkansas River paddlefish from TNFH and stocks them into a Kansas reservoir. All paddlefish stocked from the TNFH in Oklahoma waters are transported in a 450 gallon fish distribution truck. At the stocking location, water is bucketed or pumped from the lake into the tank to acclimate fish to the lake water temperature. Fish are then netted out of the tank, and (or) released through a 5.5 inch opening in the rear of the tank. All water in the tank is drained at the river or lake being stocked.

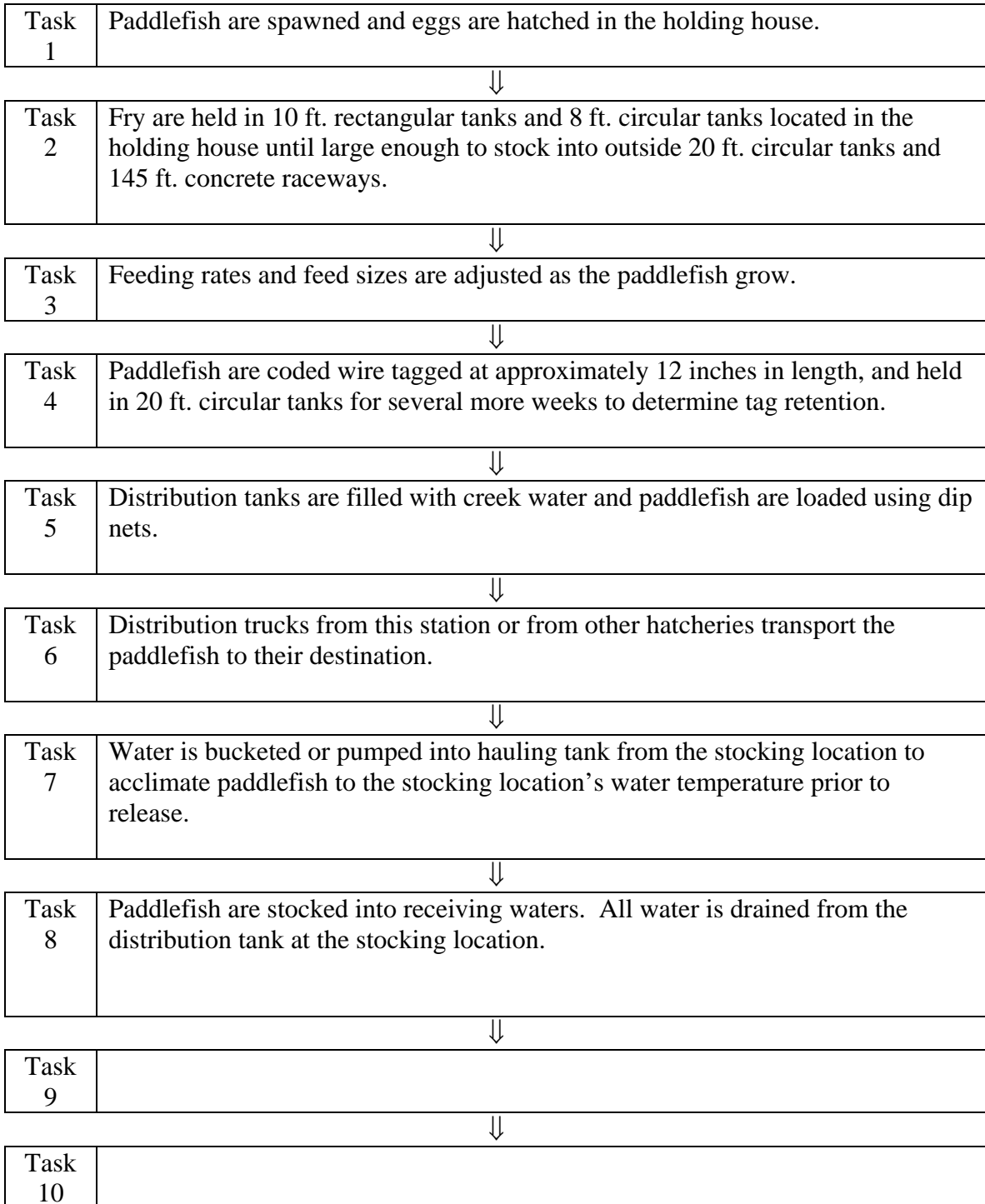
HACCP Step 2 – Identify Potential Hazards

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

Hazards: Species Which May Potentially Be Moved/Introduced
Vertebrates: black bullhead, black redhorse, golden shiner, goldfish, logperch, mosquitofish, largemouth bass, smallmouth bass, spotted bass, sunfish (bluegill, green, longear, orange spotted, redear)
Invertebrates: Asian clams, water flea (<i>Daphnia lumholtzi</i>), and zebra mussels
Plants: Brazilian waterweed, curly pondweed, dotted duckweed, Eurasian water-milfoil, golden alga (<i>Prymnesium parvum</i>), parrot feather, Uruguay seedbox, water-cress, yellow floating-heart, and other non-target vegetation
Other Biologics (e.g. disease, pathogen, parasite): Largemouth bass virus (Ranavirus) and Common parasites found on warm-water species and paddlefish: Trichodina, Costia, White Grub, Ambiphyra, Cleidodiscus and Ichthyophthirius
Others (e.g. construction materials, etc.): None

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)



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)
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Task 1 Paddlefish are spawned and eggs are hatched in the holding house.	Vertebrates	Yes	ANS and non-target vertebrates could enter tanks through water supply	Use a recirculation system with a biofilter and UV light	Yes
	Invertebrates	"	ANS and non-target invertebrates could enter tanks through water supply	"	"
	Plants	"	ANS and non-target plant material could enter tanks through water supply	"	"
	Others	"	Possibility of external parasites exist on ANS and non-target fish species that could enter through the water supply	"	"

Hazard Analysis Worksheet (continued)

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)
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Task 2 Fry are held in 10 ft. rectangular tanks and 8 ft. circular tanks located in the holding house until large enough to stock into outside 20 ft. circular tanks and 145 ft. concrete raceways.	Vertebrates	No	Paddlefish fry are held under controlled conditions in the holding house	None	No
	Invertebrates	"	"	"	"
	Plants	"	"	"	"
	Others	"	"	"	"

Hazard Analysis Worksheet (continued)

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)
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Task 3 Feeding rates and feed sizes are adjusted as the paddlefish grow.	Vertebrates	No	Fry are fed a prepared starter feed	None	No
	Invertebrates	"	"	"	"
	Plants	"	"	"	"
	Others	"	"	"	"

Task 4 Paddlefish are coded wire tagged at approximately 12 inches in length, and held in 20 ft. circular tanks for several more weeks to determine tag retention.	Vertebrates	Yes	ANS and non-target vertebrates could enter tanks through water supply	Filter incoming water.	Yes
	Invertebrates	"	ANS and non-target Invertebrates could enter tanks through water supply	"	"
	Plants	"	ANS and non-target plant material could enter tanks through water supply	"	"
	Others	"	Possibility of external parasites exist on paddlefish	Fish are checked for parasites and given a therapeutic treatment if needed.	"

Hazard Analysis Worksheet (continued)

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)
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<p>Task 5 Distribution tanks are filled with creek water and paddlefish are loaded using dip nets.</p>	Vertebrates	Yes	ANS and non-target vertebrates could be present in the water	Filter water used to fill distribution tanks and grade out ANS and non-target species while loading.	Yes
	Invertebrates	"	ANS and non-target invertebrates could be present in the water or on dip nets if dip nets are not clean and free of debris	Filter water used to fill distribution tanks and remove invertebrates if visible while loading. Sanitize, clean and remove any sediment or debris on dip nets. Sterilize water with a UV light.	"
	Plants	"	ANS and non-target plant material could be present in the water or on dip nets	Filter water used to fill distribution tanks. Sanitize and clean dip nets. Sterilize water with a UV light.	"
	Others	"	Possibility of external parasites exist on ANS and non-target fish species that may enter through the water supply	Filter water used to fill distribution tanks and grade out ANS and non-target species while loading. Sterilize water with a UV light.	"

Hazard Analysis Worksheet (continued)

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)
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Task 6 Distribution trucks from this station or from other hatcheries transport the paddlefish to their destination.	Vertebrates	No	N/A	N/A	No
	Invertebrates	"	"	"	"
	Plants	"	"	"	"
	Others	"	"	"	"

Hazard Analysis Worksheet (continued)

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)
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<p>Task 7 Water is bucketed or pumped into hauling tank from the stocking location to acclimate paddlefish to the stocking location's water temperature prior to release.</p>	Vertebrates	No	Draining all water from the tank at the stocking location prevents transfer of ANS and non-target vertebrates back to the facility.	None	No
	Invertebrates	Yes	ANS and non-target invertebrates could be present in the water.	The hauling truck and related equipment is inspected and disinfected before leaving the stocking location. A drying out period follows.	Yes
	Plants	"	ANS and non-target plant material could be present in the waters.	The hauling truck and related equipment is inspected and disinfected before leaving the stocking location. A drying out period follows.	"
	Others	No	Draining all water from the tank at the stocking location prevents transfer of parasites back to the facility.	None	No

Hazard Analysis Worksheet (continued)

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)
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<p>Task 8 Paddlefish are stocked into receiving waters. All water is drained from the distribution tank at the stocking location.</p>	Vertebrates	No	The transfer of ANS and non-target vertebrates have been eliminated or significantly reduced.	None	No
	Invertebrates	"	The transfer of ANS and non-target invertebrates have been eliminated or significantly reduced.	"	"
	Plants	"	The transfer of ANS and non-target plant material have been eliminated or significantly reduced.	"	"
	Others	"	The transfer of ANS and non-target species have been eliminated or significantly reduced.	"	"

HACCP Step 5 – HACCP Plan Form

HACCP Plan Form

(all CCP's or "yes's" from column 6 of HACCP Step 4 – Hazard Analysis Worksheet)

Critical Control Point (CCP)	Significant Hazard(s)	Limits for each Control Measure	Monitoring				Evaluation & Corrective Action(s) (if needed)	Supporting Documentation (if any)
			What	How	Frequency	Who		
<p>Task 1 Paddlefish are spawned and eggs are hatched in the holding house.</p>	<p>Possibility of ANS and non-target fish species, invertebrates, plant material and possible parasites that exist on fish could be present in the water</p>	<p>A recirculation system with a biofilter and UV light prevents ANS and non-target vertebrates, invertebrates and plant material from entering water supply. Administering therapeutic treatments on the fish controls parasites.</p>	<p>Ensure the recirculation system, biofilter and UV light is functioning properly.</p>	<p>Visually inspect equipment</p>	<p>Often</p>	<p>Hatchery personnel</p>	<p>Assess appropriate sock and mesh sizes for filtering water lines.</p>	
<p>Task 4 Paddlefish are coded wire tagged at approximately 12 inches in length, and held in 20 ft. circular tanks for several more weeks to determine tag retention.</p>	<p>Possibility of ANS and non-target fish species, invertebrates, plant material and possible parasites that exist on fish could be present in the water</p>	<p>Placing socks over water lines prevents ANS and non-target vertebrates, invertebrates and plant material from entering water supply. Administering therapeutic treatments on the fish controls parasites.</p>	<p>Ensure socks are functioning properly. Remove ANS and non-target species from tank if seen.</p>	<p>Visually inspect equipment</p>	<p>Often</p>	<p>Hatchery personnel</p>		

HACCP Step 5 – HACCP Plan Form (continued)

Critical Control Point (CCP)	Significant Hazard(s)	Limits for each Control Measure	Monitoring				Evaluation & Corrective Action(s) (if needed)	Supporting Documentation (if any)
			What	How	Frequency	Who		
<p>Task 5 Distribution tanks are filled with creek water and paddlefish are loaded using dip nets.</p>	<p>Possibility of ANS and non-target vertebrates, invertebrates, plant material and possible parasites that exist on fish could be present in the water</p>	<p>Filter water during distribution tank filling. Sanitize and clean dip nets. Larger mesh nets are used to catch 12 inch paddlefish, and each net load is inspected for ANS or non-target species.</p>	<p>Ensure filter is in place and functioning. Ensure dip nets and other harvesting equipment allows ANS to escape, is clean and free of debris.</p>	<p>Visually inspect filter and net loads.</p>	<p>Immediately before loading onto distribution truck and during every net load</p>	<p>Hatchery personnel</p>	<p>Clean and sanitize nets prior to filling tanks and loading fish.</p>	
<p>Task 7 Water is bucketed or pumped into hauling tank from the stocking location to acclimate paddlefish to the stocking location's water temperature prior to release.</p>	<p>Possibility of ANS and non-target invertebrates and plant material may be transferred from stocking location back to TNFH.</p>	<p>Thoroughly drain water from tank, followed by an inspection. Clean and sanitize tank and equipment followed by a drying out period.</p>	<p>Ensure all water is drained from tank at stocking location, and inspect equipment and truck.</p>	<p>Visually inspect equipment and remove and drain all water and debris at stocking location. Disinfect hauling tank and equipment at stocking location. Allow tank and equipment to dry.</p>	<p>Every distribution load</p>	<p>Hatchery personnel</p>	<p>Clean and sanitize nets prior to filling tanks and loading fish.</p>	

HACCP Step 5 – HACCP Plan Form (continued)

Facility: Tishomingo National Fish Hatchery	Activity: Paddlefish Production
Address: 5503 W. Hwy 7 Tishomingo, OK 74530	
Signature: HACCP Plan was followed.	Date: