Title of HACCP Plan

(Hazard Analysis and Critical Control Point)

Stocking Program

Updated 5/2/00

1. Product Description

Firm Name:	Dexter National Fish Hatchery and Technology Center
Firm Address:	P. O. Box 219 Dexter, NM 88230
Species of fish:	Woundfin *Plagopterus argentissimus;* Guzman beautiful shiner *Cyprinella formsa formosa*; Rio Grande silvery minnow *Hybognathus amarus*; Leon Springs pupfish *Cyprinodon bovinus*; Desert pupfish *C. macularis*; Comanche Springs pupfish *C. elegans*; Gila topminnow *Poeciliopsis o. occidentalis*; Big Bend gambusia *Gambusia gaigei*; and Pecos gambusia *G. nobilis*.
Cultured, wild harvested, or both:	Cultured and wild; all life stages
Harvest method:	Entire life cycle in ponds; annually, some proportion of adults and juveniles harvested by trap or seine following pond draw-down in fall; these fish are moved inside to overwinter; rest remain to overwinter in ponds; fish held inside are crowded and dip-netted when moved from one inside unit to another, however, once fish are brought inside to overwinter, they are rarely moved until spring when they are restocked into their respective pond in conjunction with their counterparts overwintered in the pond.
Method of distribution and storage:	Currently, only two (perhaps three) of the following nine species are used to produce fish for distribution off-site (see also above)
Intended use and consumer:	Artificial genetic refugia; some very limited pond spawning and production to distribute offspring for reintroduction into suitable habitat for restoration, recovery, research, education.

2. Flow Diagram

Step 1		Captive AGR populations maintained in small (.04-.1 ha) earthen ponds all year. One fish species or population per pond. Little management beyond daily supplemental feeding formulated diet, maintaining water level with fresh flow of abiotic well water, observing water quality, and frightening away fish-eating birds. Population densities (kg/ha) very low.
Step 2		In the fall, some number of fish (*removal ranging from [Guzman beautiful shiner and woundfin] 1/3 to ½ the population, generally between 500 and 1000 individuals of all ages, to removal of entire population*) are harvested from ponds by seine or trap and transported inside to overwinter. In cases where the entire population is harvested and fish moved inside, fish are seined and dipnetted from the pond kettle to the trailer mounted hauling unit as the pond drains and all effluent is discharged into sump ponds and contained on-site. No effluent is discharged from the facility.
Step 3		Fish overwintered in ponds managed in same manner as during the rest of the year until spring.
Step 4		Fish overwintered inside are brought from the pond in a trailer-mounted distribution unit filled with abiotic well water, stress-reducing salt-based additives and supplied with bottled oxygen. Fish are removed from the hauling unit with a dip net and counted into their overwintering tank. Fish are supplied with single pass abiotic well water and fed formulated diets exclusively.
Step 5		In spring, ponds drained and all overwintered fish harvested from each pond and transferred to freshly filled ponds, generally an adjacent pond (filled and fallow rotation). Ponds are prepared for spring stocking by drying for one year, disking, treating with a pre-emergent vegetation control chemical, and filled and maintained with abiotic well water. Effluent is discharged into sump ponds and contained on-site.
Step 6		Fish overwintered inside are moved outside in spring in the same manner as they were moved in the previous fall. Fish are removed with a dipnet from their overwintering tank and counted into the trailer-mounted hauling unit. They are transported to the freshly filled earthen pond to be stocked with the portion of the population overwintered outside.
Step 7		Occasionally, some fish removed from ponds for off-site distribution (woundfin and Leon Springs pupfish; perhaps Rio Grande silvery minnow). Fish are seined or trapped from pond , placed in trailer-mounted hauling unit and transported to indoor holding facility. In that case, there, fish are removed from hauling unit with dipnet and counted into holding tank. There they remain for 48 h without feed under close scrutiny. During that time they are examined for pathogens or parasites and treated as necessary prior to loading onto a transportation unit for off-site distribution. Fish are dipnetted from holding tank into hauling unit filled with Dexter's abiotic well water supplied with bottled oxygen and may contain stress-reducing salt-based compounds.
Step 8		Fish are transported to destination, generally transferred to another hauling unit, facility, or stocking location.
Step 9		Aquatic organisms brought to the Dexter facility from another facility or from the wild with potential hitch-hiking ANS.
Step 10		
Step 11		
Step 12		

3. Potential 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. These are called *Aquatic Nuisance Species* (ANS).

a. ANS Fish: Any of the other fish species or populations reared and maintained on the hatchery for other than the intended purpose, destination, or stocking location ( ); any

undesirable fish brought on to Dexter facility.

b. ANS Other Vertebrates: Various amphibians of different life stages; turtles.

c. ANS Invertebrates: Various unidentified snail, aquatic insect, and zooplankton spp; various pathogenic or parasitic, internal or external organisms ranging from viruses to bacteria to protozoans to crustaceans, flukes, trematodes, and roundworms.

d. ANS Plants: *Chara spp*., filamentous algae *Pithophora spp*. and various unidentified phytoplankton spp.

4. Hazard Analysis Worksheet

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
1)Pond rearing and management.	Fish	Yes	Fish movement among ponds is a critical ANS control point when several very similar species exist on the same facility and adults are very small,(< 50 mm TL). Smaller fish are more easily transferred unintentionally from pond to pond in part because identification among populations or species of small, closely related fish may be difficult. ANS fish contamination is more likely and detection more unlikely than with larger more easily identified fishes or species. Among pond transfers possible (via predatory birds), however, the cases of that occurrence at Dexter appear rare and the risk low.	Employ QA/QC management safeguards (PPPs): During this phase, no organisms leave hatchery; water supply abiotic well water; all facility effluent contained on station; scientific pond management, i.e. each pond contains only one fish species or population; distance among high-risk ponds sufficient that across pond transfer unlikely; target populations or species are managed using adjacent ponds. Train staff to provide KSAEs necessary to reduce risk of a hazardous ANS contamination, especially expertise in systematic and taxonomic ID. Develop batch marks to distinguish among populations or species; questionable fish (in terms of origin, genetic or taxonomic identity) are properly disposed of. Genetic monitoring PPPs are planned and implemented. Predatory bird management.	Yes
	Other Vertebrates	No	Employ QA/QC management safeguards (PPPs): During this phase, no organisms leave hatchery; water supply abiotic well water; all facility effluent contained on station; Minimal	n/a	No

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
			opportunity for management related extra-pond transfer of organisms at this stage; other vertebrates rarely found in ponds and if found easily identified and removed.		
	Invertebrate	No	Same as above except ANS invertebrates difficult to observe at this stage(unless fish are behaving strangely) until fish are sampled or ponds harvested.	n/a	No
	Plant	No	Employ QA/QC management safeguards (PPPs): During this phase, no organisms leave hatchery; water supply abiotic well water; all facility effluent contained on station; No opportunity for extra-pond transfer of organisms at this stage;	n/a	No
2)Fall movement of fish from ponds to inside overwintering facilities.	Fish	No	Employ QA/QC management safeguards (PPPs): No fish leave station during this phase. Fish harvested from ponds are seined and placed into the trailer-mounted hauling unit filled with abiotic well water. Fish are transported to inside facilities where they are offloaded from the hauling unit with dipnets and placed into segregated indoor overwintering tanks. Most ANS fish easily observed and removed at this time; risk low.	n/a	No
	Other Vertebrates	No	Same as above.	n/a	No
	Invertebrate	Yes	Potential for internal and external parasitic and pathogenic organisms introduced from outside to inside environment. Snails.	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and application of scientific fish health management practices, particularly preventative measures but including appropriate examination, diagnosis, and treatment PPPs; single pass abiotic well water; all facility	Yes

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
				effluent discharged into on-site sump ponds; no extra-facility effluent discharge. Snail eradication program, consider investigation of various moluscacides.	
	Plant	No	See Step 2) Fish and Other vertebrates	n/a	No
3) Overwintering fish in ponds.	Fish	Yes	See Step 1) Fish	See Step 1) Fish	Yes
	Other Vertebrates	No	See Step 1) Other	n/a	No
	Invertebrate	No	See Step 1) Invertebrates	n/a	Yes
	Plant	No	See Step 1) Plants	n/a	No
4) Overwintering fish inside.	Fish	No	See Step 2) Fish	n/a	No
	Other Vertebrates	No	See Step 2) No other vertebrates inside.	n/a	No
	Invertebrate	Yes	See Step 2) Invertebrates; Also, there is potential for parasite and disease transmission among inside tanks.	See Step 2) Invertebrates	Yes
	Plant	No	See Step 1) No plants inside.	n/a	No
5)Spring pond harvest and transfer of fish to new pond.	Fish	No	Fish moved immediately to adjacent pond filled and maintained with abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge. No organisms transported inside for examination, treatment (unless there is reason) nor off-site for distribution.	n/a	No
	Other Vertebrates	No	Same as above for fish	n/a	No
	Invertebrate	No	Same as above for fish	n/a	No
	Plant	No	Same as above for fish	n/a	No
6) Spring harvest and transfer of fish overwintered inside outside and stocked back into freshly filled pond concurrently with those overwintered in pond.	Fish	No	Employ QA/QC management safeguards (PPPs): No fish leave station during this phase. When fish harvested from inside they are dipnetted from overwintering tank into the trailer-mounted hauling unit filled with abiotic well water. Fish are offloaded from the hauling unit with dipnets and stocked into freshly filled pond. Most ANS fish easily observed and removed when fish inside;	n/a	No

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
			all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge. ANS hazard risk low.		
	Other Vertebrates	No	No other vertebrates inside.	n/a	No
	Invertebrate	No	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and application of scientific fish health management practices, particularly preventative measures but including appropriate examination, diagnosis, and treatment PPPs; single pass abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge. Snail eradication program.	n/a	No
	Plant	No	No plants inside.	n/a	No
7) Fish harvested from pond, moved inside, held for offsite distribution, loaded on hauling unit	Fish	Yes	Llikely point for occurrence of a ANS fish hazard.	Employ QA/QC management safeguards (PPPs): With rare exceptions, ponds contain only one species or population; accidental introduction of ANS fish into ponds within or from outside facility highly unlikely. When fish held inside for loading and off-site distribution, fish to fish and tank to tank contact strictly controlled; single pass well water. all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge. Close visual examination of fish in holding tanks before loading. Genetic monitoring planned.	Yes
	Other Vertebrates	No	Employ QA/QC management safeguards (PPPs): During this phase, water supply abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge; Minimum management	n/a	No

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
			opportunity for inadvertent transfer of organisms at this stage due to mgt error; other vertebrates rarely found outside and if found, easily identified and removed.		
	Invertebrate	Yes	Potential for internal and external parasitic and pathogenic organisms introduced from outside to inside environment. Snails.	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and application of scientific fish health management practices, particularly preventative measures but including appropriate examination, diagnosis, and treatment PPPs; single pass abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge. Snail eradication program.	Yes
	Plant	No	Employ QA/QC management safeguards (PPPs): same as for fish and other invertebrates, all plants cleansed.	n/a	No
8) Fish transported to off-site destination.	Fish	No	Employ QA/QC management safeguards (PPPs): Prior to loading in distribution unit, fish held inside 48 hours without food in single pass abiotic well water; fish to fish and tank to tank contact strictly controlled; target fish cleansed of ANS fishes.	n/a	Yes
	Other Vertebrates	No	Employ QA/QC management safeguards (PPPs): same as above except other vertebrates cleansed.	n/a	No
	Invertebrate	Yes	Possibility must be addressed of external or internal parasitic or pathogenic invertebrate organisms on fish for loading and distribution.	Employ QA/QC management safeguards (PPPs): 72 to 96 h prior to harvest (either inside or outside environments) sample and examine fish followed, where appropriate, by treatment; During 48 h holding period repeat process. Cleanse other invertebrates, principally aquatic insects,	Yes

(1) Harvest or Aquaculture Step	(2) Identify potential ANS hazards introduced or controlled at this step (1)	(3) Are any potential ANS hazards significant? (Yes/No)	(4) Justify your decisions for column 3.	(5) What preventive measures can be applied to prevent the significant hazards?	(6) Is this step a critical control point? (Yes/No)
				crustaceans, and snails from the holding tanks. Fill hauling unit with abiotic well water including stress reducing additives. *Fish must be certified ANS (disease) free before leaving facility*	
	Plant	No	Employ QA/QC management safeguards (PPPs): same as for fish and other invertebrates, all plants cleansed.	n/a	No
9) Fish brought onto the facility from another facility or from the wild with potential ANS.	Fish	Yes	If not *certified ANS (fish) free and disease free.*	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (fish) free	Yes
	Other Vertebrates	Yes	If not *certified ANS (other vertebrate) free and disease free.*	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (other vertebrate) free	Yes
	Invertebrate	Yes	If not *certified ANS (invertebrate/disease) free and disease free.*	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (invertebrate/disease) free	Yes
	Plant	Yes	If no*t certified ANS (plant) free and disease free.*	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (plant) free	Yes

5. HACCP Plan Form

(1) Critical Control Point (CCP)	(2) Significant Hazard(s)	(3) Control Measures	Monitoring				(8) Corrective Actions(s)	(9) Records	(10) Verification
			(4) What	(5) How	(6) Frequency	(7) Who			
1) Pond rearing and management	ANS fish	Employ QA/QC management safeguards (PPPs): During this phase, no organisms leave hatchery; water supply abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharged; scientific pond management, i.e. each pond contains only one fish species or population; distance among high-risk ponds sufficient that across pond transfer unlikely; target populations or species are managed using adjacent ponds. Train staff to provide KSAEs necessary to reduce risk of a hazardous ANS contamination, especially	Prevents, controls, or reduces the risk of ANS fish contamination among ponds.	Professional knowledge, skills, and abilities to observe and take actions to employ PPPs designed to prevent, control or reduce risk of ANS fish contamination among ponds.	When unusual looking fish or unexpected fish observed in pond.	Any facility employee but particularly those most frequently in contact with the fish, i.e. fish hatchery biologist and fish feeders, animal caretakers, and bio-technicians.	Improve, monitor, and evaluate effectiveness of control measures. Knowledge of fish appearance and behavior; continuing training and education of fish hatchery employees.	Rigorous documentation of observations and activities by responsible employee, the assigned fish hatchery biologist.	Records review (monitoring) and evaluation by supervisor, hatchery manager or broodstock manager; Supervisor and fish hatchery biologist discuss and implement adaptive corrective actions and control measures (PPP improvement).

		expertise in systematic and taxonomic ID. Develop batch marks to distinguish among populations or species; questionable fish (in terms of origin, genetic or taxonomic identity) are properly disposed of. Genetic monitoring PPPs are planned. Predatory bird management.							
2) Fall movement of fish from ponds to inside overwintering facilities	ANS invertebrates	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and applicationof scientific fish health management practices, particularly preventative measures but including appropriate examination, diagnosis, and treatment PPPs; single pass abiotic well water; all facility effluent discharged into	Prevents, controls, or reduces the risk of ANS invertebrate contamination from outside to inside.	Professional knowledge, skills, and abilities to observe and take actions to employ PPPs designed to prevent, control or reduce risk of invertebrate contamination of fish, equipment, tanks, and water supply.	Anytime fish are brought inside from outside.	Any facility employee but particularly those most frequently in contact with the fish, i.e. fish hatchery biologist and fish feeders, animal caretakers, and bio-technicians.	Establish a comprehensive fish health management program reflecting a QA/QC approach. Program supported by appropriate PPPs and guidelines; emphasize ANS (parasite and pathogen) identification, disease diagnostics, prevention and treatment; quarantine facilities; improved	Rigorous documentation of observations and activities by responsible employee, the assigned fish hatchery biologist.	Records review (monitoring) and evaluation by supervisor, hatchery manager or broodstock manager; Supervisor and fish hatchery biologist discuss and implement adaptive corrective actions and control measures (PPP improvement).

		on-site sump ponds; no extra-facility effluent discharge. Snail eradication program, consider investigation of various moluscacides.					communication with FHC and other FTCs; continuing training and education of fish hatchery employees.		
3) Overwintering fish in ponds.	ANS fish	Same as Step 1) all the way across							
4) Overwintering fish inside.	ANS invertebrates	Same as Step 2) all the way across							
5) Spring pond harvest and fish transfer to new pond.	ANS hazard risk insignificant.								
6) Spring harvest and transfer of fish overwintered inside outside into freshly filled earthen pond in conjunction with those overwintered in the pond.	ANS hazard risk insignificant.								
7) Fish harvested from pond, moved inside, and held for off-site distribution; loaded on hauling unit.	ANS fish ANS invertebrates	Fish transferred inside from outside are potentially contaminated with ANS fishes that very closely resemble them phenotypically and genotypically. Consequently,	Prevents, controls, or reduces risk of ANS fishes and invertebrates from accidental movement off - site. .	Professional knowledge, skills, abilities and education to observe and take actions to employ PPPs designed to prevent, control or reduce risk of fish and invertebrate	Fish should be examined every time they are handled but especially rigorously when held for off-site distribution and on arrival at destination.	Any facility employee but particularly those most frequently in contact with the fish, i.e. fish hatchery biologist and fish feeders, animal caretakers, and bio-technicians.	A specially trained individual should be charged with the responsibility of providing ANS free certification of fish immediately prior to loading or release from isolation or	Rigorous documentation of observations and activities by responsible employee, the assigned fish hatchery biologist. ANS free certification check list; Trip sheet.	Records review (monitoring) and evaluation by supervisor, hatchery manager or broodstock manager; Supervisor and fish hatchery biologist discuss and implement

		great care is required to examine fish when placed in holding tanks inside. ANS invertebrates Same as Step 2) all the way across.		contamination of fish, equipment, tanks, and water supply.			quarantine at receiving point. Establish a comprehensive fish health management program reflecting a QA/QC approach. Program supported by appropriate PPPs and guidelines; emphasize ANS (parasite and pathogen) identification, disease diagnostics, prevention and treatment; quarantine facilities; improved communication with FHC and other FTCs; continuing training and education of fish hatchery employees.		adaptive corrective actions and control measures (PPP improvement).
8)Fish transported to off-site destination	ANS hazard risk insignificant. Assumption: Fish load certified ANS and disease free prior to loading and no water exchanges in transit.								

9 Aquatic organisms brought to hatchery from another facility or from the wild with potential hitch-hiking ANS	All four ANS categories: fish, other vertebrates, invertebrates, and plants.	Need *ANS free and fish health certificate* on arrival and before fish are off-loaded and hauling medium dumped. In addition Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until *certified ANS free and disease free*.	Prevents, controls, or reduces risk of ANS contamination of entire facility.	Professional knowledge, skills, abilities, and education to observe and take actions to employ PPPs designed to prevent, control or reduce risk of ANS contamination of entire facility.	Any time a fish with potentially hitch-hiking ANS organisms arrives on station with the intention of off-loading aquatic organisms at Dexter.	Fish Hatchery Biologist trained and authorized to certify load ANS and disease free.	Same as Step 1) but includes all potential ANS and focuses on PPPs associated with quarantine, isolation, and certification process for ANS free and disease free certification requirements.	Same as in Step 1) and includes records of all certificates. ANS free certification check list; Trip sheet.	Same as in Step 1).

Firm Name: Dexter National Fish Hatchery and Technology Center	Species of Fish: Woundfin *Plagopterus argentissimus;* Guzman beautiful shiner *Cyprinella formsa formosa*; Rio Grande silvery minnow *Hybognathus amarus*; Leon Springs pupfish *Cyprinodon bovinus*; Desert pupfish *C. macularis*; Comanche Springs pupfish *C. elegans*; Gila topminnow *Poeciliopsi o. occidentalis*; Big Bend gambusia *Gambusia gaigei*; and Pecos gambusia *G. nobilis*.
Firm Address: P. O. Box 219 Dexter, NM 88230	Method of Storage and Distribution: Currently, only two (perhaps three) of the following nine species are used to produce fish for distribution off-site (see also above). Entire life cycle in ponds; annually, some proportion of adults and juveniles harvested by trap or seine following pond draw-down in fall; these fish are moved inside to overwinter; rest of fish remain to overwinter in ponds; fish held inside are crowded and dip-netted when moved from one unit to another, however, once fish are brought inside to overwinter, they are rarely moved until spring when they are restocked into their respective pond in conjunction with fish overwintered in pond.
Signature: J. Holt Williamson	Intended Use and Consumer: Artificial genetic

	refugia; some very limited pond spawning and production to distribute for reintroduction into suitable habitat for recovery, research, education.
Date: Jun 1, 2001	