

Title of HACCP Plan
(Hazard Analysis and Critical Control Point)

Stocking Program

Updated 5/2/00

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1. Product Description

Firm Name:	Dexter National Fish Hatchery and Technology Center
Firm Address:	P. O. Box 219 Dexter, NM 88230
Species of fish:	Colorado pikeminnow <i>Ptychocheilus lucius</i> ; bonytail <i>Gila elegans</i> ; Chihuahua chub <i>G. nigrescens</i> ; Virgin River chub <i>G. robusta seminuda</i> ; Pahrnagat roundtail chub <i>G. r. jordani</i> ; Yaqui sucker <i>Catostomas bernardini</i> ; razorback sucker <i>Xyrauchen texanus</i> ;
Cultured, wild harvested, or both:	Cultured and wild; all life stages
Harvest method:	Pond-reared adults and juveniles harvested by seine following pond draw-down; fish reared or held inside are crowded and dip-netted from one unit to another.
Method of distribution and storage:	Water supplied by wells from abiotic ground source. 1) Following marking with PIT-tags, captive broodfish are pond-reared and maintained; When mature, broodfish are harvested for controlled spawning inside, then returned to pond; 2) Fertilized eggs intended for broodstock are segregated and incubated as separate family lots inside; fertilized eggs intended for production are shipped off-site or incubated and hatched inside then shipped or stocked as first feeding fry into fertilized rearing ponds. 3) Young destined for broodfish are reared inside until large enough to PIT-tag then transferred outside to ponds for growth and maturity; Some production fish may be reared or overwintered inside for later on-site pond stocking or off-site distribution; 4) Young are reared outside in ponds until harvested and moved inside for overwintering and continued growth or for off-site distribution; 5) fish destined for off-site distribution are held inside at least 48 h prior to loading into distribution units; 6) aquatic organisms are brought into the hatchery from elsewhere (another facility or from the wild) and constitutes the weakest link for facility in ANS hazard management program. On-site fish movement: fish are harvested from ponds by seine and placed into a trailer mounted hauling unit filled with abiotic well water and supplied with bottled oxygen or mechanical aeration; may include stress-reducing salt-based additives. Fish are transported to holding house, tempered if necessary, and dip-netted into holding tanks supplied with single pass abiotic well water. Fish reared and maintained inside (on single pass abiotic

	well water or recirculated treated water) are loaded for off-site distribution into hauling units filled with Dexter's abiotic well water that may or may not include stress-reducing salt-based additives. All effluent contained on-site in sump ponds.
Intended use and consumer:	On-site artificial genetic refuge populations and production broodstock development; fish produced also for further grow out at other facilities but, ultimately, for reintroduction into suitable habitat for recovery, research, education, and technology development by State and Federal agencies and universities.

2. Flow Diagram

Step 1	Broodfish harvested from ponds in spring and brought inside for spawning; gametogenesis induced in individual fish; eggs are hand-stripped and fertilized according to pedigree mating scheme; fertilized eggs are incubated by family lot in separate hatching jars, trays, or baskets. Following spawning, broodfish returned to pond freshly filled with abiotic well water.
Step 2	Depending on need or request, fertilized eggs, sac-fry, and first feeding fry or larvae are enumerated and shipped in plastic bags with abiotic well water and oxygen or retained inside for broodstock development. Larvae and juveniles intended for grow-out at Dexter are reared both inside and outside.
Step 3	Inside fish rearing in units supplied with single pass abiotic well water, heated or not, or recirculated treated water. Inside larval fish are fed first on brine shrimp then formulated feed. Juveniles are fed formulated feed. Disease treatments applied as necessary and fish sampled and inventoried routinely until ready for pond stocking or distribution. Juveniles are <i>processed</i> (harvested, sampled, inventoried, examined, treated, and marked, and transported, if necessary, to holding or other rearing tanks) in the fall, depending on need, request, or weather. Juveniles reared inside remain for continued grow-out or overwintering or they are loaded from holding units into distribution vehicles.
Step 4	Outside fish rearing is in lined or earthen ponds supplied with abiotic well water. Ponds are filled and fertilized two to three weeks prior to fish stocking. Earthen ponds receive a pre-emergent vegetation treatment. First feeding fry are enumerated, transported outside, tempered and stocked in ponds. Older juveniles are stocked in ponds later; pond-reared juveniles are fed formulated feed to supplement natural pond food organisms; parasite, disease, vegetation control treatments applied as needed. Juveniles are <i>processed</i> (harvested, tempered, transported, sampled, inventoried, examined, treated, and marked, if necessary) in the fall, depending on need, request, or weather. They are transported inside and placed in rearing or holding units where they are retained for further rearing or, after 48 h inside, they are loaded on trucks and distributed off-site.
Step 5	Fish moved off the hatchery are transported to another propagation facility or stocked directly into receiving waters. In either case, fish and hauling medium are monitored and evaluated in transit; fish are examined and their condition evaluated and recorded upon arrival at final destination. On arrival, fish are generally tempered into receiving waters and, if possible, their post-transport behavior or performance is monitored, evaluated, and recorded as is the presence/absence of ANS.
Step 6	Aquatic organisms brought on to hatchery from another facility or from the wild.
Step 7	
Step 8	
Step 9	
Step 10	

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 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, 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) Broodfish harvested from pond, brought inside, spawned (pedigreed matings) and returned to pond. Fertilized eggs are segregated as family lots.	Fish	No	Employ QA/QC management safeguards (PPPs): During this phase, no organisms leave hatchery; water supply abiotic well water; with rare exceptions (this is one), each pond contains only one fish species or population; accidental introduction of ANS fish into ponds from within or from outside facility highly unlikely; only introduced forage is rainbow trout; at harvest, adults are handpicked from seine into dip net and placed in hauling unit; all broodfish are PIT-tagged; once inside, fish to fish and tank to tank contact strictly controlled; single pass abiotic well water used in holding tanks.	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 and from parents to gametes or embryos.	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and practice of good 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.	Yes
	Plant	No	Employ QA/QC management safeguards (PPPs): Efforts made to	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)
			leave plants in pond when harvesting and loading adults; macrophytes or vascular plants removed from hauling unit before broodfish are taken from outside to inside in dipnets. Hauling water remains in hauling tank and dumped in designated secure areas; hauling unit disinfected and flushed with well water; holding units are thoroughly cleaned by sweeping and flushing with single pass abiotic well water; all facility effluent discharged into on-site sump ponds; no extra-facility effluent discharge.		
2) Inside incubation and hatching of fertilized eggs and rearing of larvae as broodstock or production fish prior to transfer to hatchery ponds or for off-site distribution	Fish	Yes	Multiple species/population facility with many inside tanks in close proximity; if water recirculated among units, eggs and larvae especially transmissible through common water supply <u>if not treated i.e., filtered.</u>	Employ QA/QC management safeguards (PPPs): Awareness of among unit contamination potential; strict segregation maintained among units; cover culture units; accurate and consistent labeling of units; accurate records; close observation; independent recirculation systems or collection basket at effluent to capture, contain, or destroy escapees; in-line filtration; single pass abiotic well water	Yes
	Other Vertebrates	No	Employ QA/QC management safeguards (PPPs): Transmission of other vertebrates strictly controlled during harvest and during gamete collection and fertilization; also during fertilized egg transfer to water hardening environment, to incubation chamber to rearing unit; single pass abiotic well water used during incubation, hatch, and rearing; where water is recirculated, water filtered.	n/a	No
	Invertebrate	Yes	Where water is recirculated a common	Employ QA/QC management safeguards	Yes

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			water source exists among units, filtration may not be adequate to prevent transmission of very small invertebrates among units.	(PPPs): Use single pass well water to each unit or add to recirculation system ozonation or UV irradiation components in-line to kill very small invertebrates occurring in water column. Also, good fish health management PPPs to avoid tank to tank contamination with equipment.	
	Plant	No	Employ QA/QC management safeguards (PPPs): Proper water treatment and disposal.	n/a	No
3) Inside fish rearing for on-site stocking into ponds or distribution off-site.	Fish	Same as step 2	Same as step 2	Same as step 2	Same as step 2
	Other Vertebrates	Same as step 2	Same as step 2	Same as step 2	Same as step 2
	Invertebrate	Same as step 2	Same as step 2	Same as step 2	Same as step 2
	Plant	Same as step 2	Same as step 2	Same as step 2	Same as step 2
4) Outside rearing of young fish in ponds prior to their movement back inside for additional grow-out or to hold for loading and offsite distribution	Fish	No	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. During continued growout inside, no organism leaves facility; When fish held inside for loading and off-site distribution, fish to fish and tank to tank contact strictly controlled; single pass well water.	n/a	No
	Other Vertebrates	No	same as above	n/a	No
	Invertebrate	Yes	Potential for parasitic and pathogenic organisms introduced from outside to inside environment or from fish to fish or tank to tank contact inside.	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and practice of good fish health management practices, particularly preventative measures but including appropriate examination, diagnosis, and treatment. single pass well water; All	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)
				facility effluent discharged into sump ponds and remains within property boundaries. No extra-facility effluent discharge.	
	Plant	No	Employ QA/QC management safeguards (PPPs): During this stage, no organism leaves facility ; fish to fish and tank to tank contact strictly controlled; Good housekeeping efforts made to leave plants in pond when harvesting and loading adults; macrophytes or vascular plants removed from hauling unit before fish are taken from outside to inside with dip nets. Hauling water remains in hauling tank; Tanks are thoroughly cleaned by sweeping, disinfecting, and flushing with well water to be dumped in designated secure areas. All facility effluent discharged into sump ponds and remains within property boundaries. No extra-facility effluent discharge.	n/a	No
5) Fish transported off hatchery to another facility or to stock directly into receiving waters.	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	No
	Other Vertebrates	No	Employ QA/QC management safeguards (PPPs): same as above except other vertebrates cleansed.	n/a	No
	Invertebrate	Yes	External or internal parasitic or pathogenic invertebrate organisms possible 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	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)
				appropriate, by treatment; During 48 h holding period repeat process. Cleanse other invertebrates, principally aquatic insects, crustaceans, and snails from the holding tanks. Fill hauling unit with abiotic well water including stress reducing additives. <i>Fish must be certified ANS (disease) free before leaving facility</i>	
	Plant	No	Employ QA/QC management safeguards (PPPs): same as for fish and other invertebrates except all plants cleansed.	n/a	No
6) Fish brought onto the facility from another facility or from the wild.	Fish	Yes	If no ANS (<i>fish</i>) free and disease free certification	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (fish) free	Yes
	Other Vertebrates	Yes	If no ANS (<i>other vertebrate</i>) free and disease free certification	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (other vertebrate) free	Yes
	Invertebrate	Yes	If no ANS (<i>invertebrate/disease</i>) free and disease free certification	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (<i>invertebrate/disease</i>) free	Yes
	Plant	Yes	If no ANS (<i>plant</i>) free and disease free certification	Employ QA/QC management safeguards (PPPs): isolate or quarantine fish until certified ANS (<i>plant</i>) free	Yes
	Fish				
	Other Vertebrates				
	Invertebrate				
	Plant				
	Fish				
	Other Vertebrates				
	Invertebrate				
	Plant				
	Fish				
	Other Vertebrates				
	Invertebrate				

(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)
	Plant				
	Fish				
	Other Vertebrates				
	Invertebrate				
	Plant				
	Fish				
	Other Vertebrates				
	Invertebrate				
	Plant				
	Fish				
	Other Vertebrates				
	Invertebrate				
	Plant				

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) Broodfish harvest and spawning inside	Invertebrates, usually parasites, pathogens, and snails.	Employ QA/QC management safeguards (PPPs): Awareness, knowledge and practice of good fish health management, 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.	Prevents, controls or reduces risk of invertebrate contamination of fish, equipment, tanks, and water supply.	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.	Generally any time fish are handled, particularly when fish are stocked and harvested into ponds and handled during spawning. Also any time fish behavior is observed as unusual, particularly during feeding and water quality monitoring.	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 communication with FHC and other FTCs; 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).
2) Inside incubation and hatching of fertilized eggs or larvae from no target spp or populations. larval fish rearing.	Fish, generally as fertilized eggs or larvae from no target spp or populations. Invertebrates, usually parasites, pathogens, and	Employ QA/QC management safeguards (PPPs): Awareness of among unit contamination potential; strict segregation maintained	Prevents, controls or reduces risk of unwanted fish movement among tanks and within water supply. Prevents,	Professional knowledge, skills, and abilities to observe and take actions to employ PPPs designed to prevent, control or reduce risk of	Generally any time fish are handled, particularly when fertilized eggs are transferred from spawning area to hatchery/nursery , during	Any facility employee but particularly those most frequently in contact with the fish, i.e. fish hatchery biologist and fish feeders, animal caretakers, and	Employ QA/QC management safeguards (PPPs): Awareness of among unit contamination potential; strict segregation maintained among	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

	snails.	<p>among units; cover culture units; accurate and consistent labeling of units; accurate records; close observation; independent recirculation systems or collection basket at effluent to capture, contain, or destroy escapees; in-line filtration; single pass abiotic well water</p> <p>Same as above for fish (fertilized eggs and larvae) except instead of a "collection basket" in-line UV irradiation or ozonation component should be added to the recirculation system. Good fish health mgt. PPPs to avoid cross contamination among units.</p>	controls or reduces risk of invertebrate contamination of fish, equipment, tanks, and water supply.	<p>unwanted fish movement among tanks and within water supply.</p> <p>Same as above but with respect to invertebrates.</p>	<p>incubation and when larvae are handled. Also any time fish behavior is observed as unusual, particularly during feeding and water quality monitoring.</p> <p>Same as above but with respect to invertebrates.</p>	<p>bio-technicians.</p> <p>Same as above.</p>	<p>units; cover culture units; accurate and consistent labeling of units; accurate records; close observation; independent recirculation systems or collection basket at effluent to capture, contain, or destroy escapees; in-line filtration; single pass abiotic well water</p> <p>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.</p>	Same as above	<p>biologist discuss and implement adaptive corrective actions and control measures (PPP improvement).</p> <p>Same as above.</p>
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3) Inside fish rearing (beyond the larval stage) for on-site stocking or offsite distribution.	Same as Step 2) (above) all the way across.								
4) Outside rearing of young fish in ponds (beyond the larval stage) and movement back inside for additional grow-out or to hold for loading and off-site distribution	Invertebrates usually parasites, pathogens, and snails.	Same as for Step 1) (above) all the way across.							
5) Fish transported of hatchery to another facility or to stock directly into receiving waters.	Invertebrates usually parasites, pathogens, and snails.	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, crustaceans and snails from the holding tanks. Fill hauling unit with abiotic well water including	Same as for Steps 1) and 4) all the way across.						

		stress reducing additives. <i>Fish must be certified ANS (disease) free before leaving facility</i>							
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6) Aquatic organisms brought to hatchery from another facility.	All four categories: fish, other vertebrates, invertebrates, and plants.	Need <i>ANS free and fish health certificate</i> 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 <i>certified ANS free and disease free</i> .	Prevents, controls, or reduces risk of ANS contamination of entire facility.	Professional knowledge, skills, and abilities 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 hitchhiking ANS organisms arrives on station with the intention of leaving fish at Dexter.	Fish Hatchery Biologist	Same as Step 1) but includes all potential ANS and focuses on PPPs associated with quarantine and isolation and certification process for ANS free and disease free certification requirements.	Same as in Step 1) and includes records of all certificates.	Same as in Step 1).
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Firm Name: Dexter National Fish Hatchery and Technology Center	Species of Fish: Colorado pikeminnow <i>Ptychocheilus lucius</i> ; bonytail <i>Gila elegans</i> ; Chihuahua chub <i>G. nigrescens</i> ; Virgin River chub <i>G. robusta seminuda</i> ; Pahrangat roundtail chub <i>G. r. jordani</i> ; Yaqui sucker <i>Catostomas bernardini</i> ; razorback sucker <i>Xyrauchen texanus</i> ;
Firm Address: P. O. Box 219 Dexter, NM 88230	Method of Storage and Distribution: earthen and plastic lined ponds, inside tanks, raceways, and aquaria; distributed in truck or trailer-mounted hauling units. Facility water supply abiotic ground water pumped and delivered to inside and pond rearing facilities; fish cultured mostly using single pass well water but some recirculated treated water also used. All facility effluent contained on station in sump ponds.
Signature: J. Holt Williamson	Intended Use and Consumer: On-site artificial genetic refuge populations and production broodstock development; fish production, (includes

	fish produced for further grow out at other facilities) ultimately, for reintroduction into suitable habitat for recovery, research, education, and technology development by State and Federal agencies and universities.
Date: May 31, 2001	