

SHRIMP FARM INSPECTION PROGRAM
REPORT, 2002

by

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ABSTRACT

This report documents results from Texas Parks and Wildlife Department (TPWD) shrimp farm inspections conducted during 2002. In 2002, shrimp farm inspectors conducted 1,781 pond inspections to assess the health of shrimp stocks on two research and nine commercial facilities. TPWD inspectors requested 11 samples submitted to Texas Veterinary Medical Diagnostic Laboratory (TVMDL) in College Station, Texas for disease analysis. Shrimp farm operators also voluntarily self-submitted 134 samples of shrimp in questionable health to the TVMDL for disease analysis.

These TPWD field inspections and farm operator-submitted samples suggest virus outbreaks did not occur in 2002. Therefore, no exotic viral diseases were introduced to the receiving waters.

INTRODUCTION

In Texas, shrimp farm inspections have been conducted by Texas Parks and Wildlife Department (TPWD) staff since 1998. The inspection program was designed to ensure exotic shrimp and/or pathogenic agents (i.e. viruses) associated with aquaculture were not introduced into Texas waters, which could harm native crustaceans. Currently, Specific Pathogen Free (SPF) Pacific white shrimp (*Litopenaeus vannamei*) are the only exotic shrimp species that can be cultured within the Texas Exotic Species Exclusion Zone (ESEZ) (Figure 1). Pacific white shrimp are currently listed on the Harmful or Potentially Harmful Exotic Fish, Shellfish, and Aquatic Plants (Appendix C). Annual inspections of commercially farmed Pacific white shrimp are conducted to ensure compliance with “department code” which was designed to prevent escapement of cultured exotic Pacific white shrimp into Texas waters (Juan and Adami, 2003). SPF Blue shrimp (*L. stylirostris*) can also be cultured on a case by case basis, which would be determined by TPWD when cultured outside of the ESEZ. These regulatory measures ensure exotic species do not escape and establish populations in Texas waters. To prevent harmful disease releases into Texas waters, and possible infection of native crustaceans, farmers must demonstrate “disease-free” status prior to discharging effluents into public waters from shrimp culture ponds (Texas Parks and Wildlife Regulations 2001).

Prior to 1992, farmers were not required to use SPF certified offspring to stock their ponds (Texas Parks and Wildlife Laws, State of Texas 1989-1990). SPF brood stock was developed in the late 1980’s and commercial trials were started in 1990. During that period, Runt Deformity Syndrome caused by Infectious Hypodermal and Hematopoietic Necrosis Virus (IHHNV) (Brock and Main 1994), was present in cultured shrimp. Because quarantines were not

yet imposed, virus latent water could be released at that time. Even though confirmed IHNV infected shrimp were destroyed, not all ponds were examined. In 1995, Taura Syndrome Virus (TSV) caused mass mortalities of Texas farm raised white shrimp (Brock et al. 1995). The culture water was voluntarily quarantined by shrimp farmers until September 1, as suggested by TPWD Coastal Fisheries management personnel, in order to prevent native juvenile white shrimp (*L. setiferus*) from exposure to the virus. Native brown shrimp (*Farfantepenaeus aztecus*) and native pink shrimp (*F. duorarum*) are not susceptible to TSV while white shrimp are susceptible to the disease according to Erickson (1997).

As part of the TPWD shrimp farm inspection program, inspectors determine the general health of representative shrimp taken from every culture pond prior to discharge and/or harvest. If a shrimp disease manifestation is observed and verified through laboratory examination, then the inspectors quarantine the facility until appropriate action can be taken to remedy the disease problem. The objective of this report is to document shrimp farm inspections conducted during the 2002 production season and report general trends in shrimp health and production efforts.

MATERIALS AND METHODS

TPWD personnel conducted two types of exotic shrimp inspections: 1) facility inspections, and 2) shrimp health examinations. Inspection procedures for facilities and shrimp health examinations are described by Juan and Adami (2003).

Two full-time inspectors conducted the majority of the exotic species facility inspections and shrimp examinations. Additional assistance was provided by Coastal Fisheries Division

personnel as needed. The inspection team covered the entire Texas coast in 2002. West Texas shrimp farms were not inspected in 2002.

Facility Inspections

Shrimp facility inspections were conducted to ensure that facility improvements or renovations (i.e., farms adding culture ponds or modifying discharge structures, fill and drain canals, wetlands or settling basins) complied with TPWD shrimp farm regulations (Texas Parks and Wildlife Regulations 2001). Facility inspections included visits to existing and new facilities.

Facility inspection criteria for screening requirements are designed to prevent escapement of cultured exotic Pacific white shrimp into Texas waters. Department policy required an Exotic Species Culture Facility Inspection Report (Appendix A) be completed by an inspector and submitted to the Exotic Species Program Leader for final review. The Exotic Species Program Leader will issue a permit if all departmental criteria on the checklist have been satisfied. If the criteria have not been approved, a second inspection was conducted at a later date after the farm operator made improvements as specified. A permit must be issued to the applicant before the facility can be stocked.

Shrimp Health Examinations

Shrimp inspection protocols were developed by TPWD Resource Protection and Coastal Fisheries Divisions personnel as outlined in 71st Legislature, Texas Senate Bill 1507, Fish

Farming Act of 1989, Chapter 637 to protect state waters and marine ecosystems. Shrimp health examinations (e.g. in ponds, tanks and raceways) were conducted by visual examination of shrimp from each culture unit. Relative health of the shrimp was evaluated with the primary objective of preventing disease manifestations from impacting marine ecosystems with the effluent discharge. Inspectors recorded shrimp health examination data on the Clinical Analysis Checklist (Appendix B). Shrimp health examinations were conducted once shrimp reached 6 to 8 weeks of age. At this point in their life cycle, shrimp weigh approximately 1.0 g or more and are large enough to exhibit signs (as listed on the clinical analysis checklist) of disease manifestation. A minimum of 50 shrimp were examined per culture unit during the production season (March-November). Examinations were conducted prior to the release of effluent water from the facility. Once the shrimp were examined and declared to be disease-free, water was allowed to be discharged from the facility for a two week period into state waters without additional examinations. However, if disease symptoms were observed during the examination, TPWD personnel imposed a “quarantine” status on the facility. The duration of the quarantine period varied depending on the severity of the infestation. If TSV was observed, the quarantine period might extend until September 1st. Detection of IHHNV, Yellow Head Virus (YHV) or White Spot Syndrome Virus (WSSV) in infected shrimp, require a 90 day post harvest effluent quarantine period. Shrimp testing positive for TSV require a mandatory post harvest effluent quarantine until September 1st.

RESULTS

Facility Inspections

Inspections were conducted on all shrimp farms in Texas which culture exotic Pacific white shrimp (Figure 2). The TPWD inspection team also inspected two facilities that modified their operations by adding green house nursery raceways to their systems. TPWD requires additional inspections whenever facilities modify their operations, in order to ensure continued compliance with regulations. There were no shrimp escapements reported or observed by farmers or inspectors during 2002.

Shrimp Examination Inspections

The inspection team traveled almost 15,400 miles and recorded more than 821 hours (number of hours spent in the field, which does not include administrative hours) conducting Pacific white shrimp facility inspections and shrimp examinations at nine coastal commercial farms and two coastal research facilities. Shrimp examinations started in late April 2002 and included inspection of 1,915 ponds, containing more than 108,000 shrimp per pond. TPWD inspectors requested each facility submit 11 samples (2-10 shrimp/sample) for further examination by the Texas Veterinary Medical Diagnostic Laboratory (TVMDL). Three pond samples tested positive for Necrotizing Hepatopancreatitis (NHP). This disease has not previously been documented as a threat to wild stocks.

Shrimp farmers voluntarily submitted 134 pond samples (2-10 shrimp/sample) to TVMDL for disease examination. Eighty-one pond samples were diagnosed with NHP and eight pond samples were diagnosed with Hemocytic Enteritis. Neither of these diseases has been

previously documented as a threat to wild stocks. TPWD shrimp inspection and farm operator self-submitted records for each farm are shown in Table 1.

DISCUSSION

Texas shrimp farmers cultivated 1,225 ha of ponds and harvested close to 3.8 million kg of shrimp, worth an estimated \$17.4 million in 2002 (Table 2). Production averaged 3,067 kg/ha in 2002. There were no shrimp escapements reported or observed by farmers or inspectors during 2002. The number of shrimp diseases reported was also greatly reduced in 2002.

Although a greater number of ponds were inspected in 2002, TPWD required fewer pond samples be submitted to TVMDL for disease analysis (Table 3). Contrastingly, shrimp farmers voluntarily submitted more samples than TPWD requested as an early disease detection management tool. This strategy has greatly increased Texas shrimp farm annual production yields from previous years, and totaled 3.76 million kg in 2002 (Table 2). Despite increases in production and slight increases in farm-gate value (the total price paid to the farmer at the farm site), the unit price of shrimp has declined due to increased shrimp imports and a sluggish economy (Lam, personal communication 2002). The price of shrimp was at its lowest value (approx. \$2.10/lb.) in more than 15 years (Hodgeson, personal communication 2002).

The absence of TSV, which previously affected the mid-coast areas (Adami and Juan 2004) was a positive observation noted during 2000-2002 inspections. Production of SPF disease resistant brood stock by the U.S. Marine Shrimp Farming Consortium and private brood stock producers appears to have successfully prevented diseases such as TSV, which are a concern to Texas shrimp farms.

West Texas shrimp farm inspections were not conducted by Coastal Fisheries inspectors during 2002 in order to prevent possible disease transmission from the coast to the West Texas farms. West Texas shrimp farms are currently inspected by a certified Inland Fisheries inspector.

Enforcing the use of SPF certified shrimp and vigilantly conducting timely shrimp health examinations by TPWD's inspection program has helped shrimp farmers cultivate more shrimp between 2000 and 2002. Continued surveillance of the shrimp farming industry also appears to be an important management tool for reducing the environmental risk for disease transmission to Texas marine ecosystems.

LITERATURE CITED

- Adami, Robert Jr. and Y. S. Juan 2004. Shrimp Farm Inspection Program Report, 2000 & 2001. Management Data Series Number 225. Texas Parks and Wildlife Department, Coastal Fisheries Division. Austin, TX.
- Brock, J. A., and K. L. Main. 1994. A guide to the common problems and diseases of cultured *Penaeus vannamei*. World Aquaculture Society, Baton Rouge, LA. 242 pp.
- Brock, J. A., R. Gose, D. V. Lightner, and K. Hasson. 1995. An overview on Taura syndrome, an important disease of farmed *Penaeus vannamei*. Pages 84-94 *In swimming through troubled water*, Proceedings of the special session on shrimp farming, Aquaculture '95. (C.L. Browdy & J.S. Hopkins, eds.). World Aquaculture Society, Baton Rouge, LA.
- Erickson, H. S. 1997. Effect of Taura Syndrome virus on Selected Penaeid Species and other Marine Organisms. Master's Thesis, Texas A&M University-Corpus Christi, Corpus Christi, Texas.
- Hodgeson, Les. 2002. (Personal communication) Marco Sales. Brownsville, Texas.
- Juan, Y. S. and R. Adami, Jr. 2003. Texas Parks and Wildlife Shrimp Culture Inspection Program-A Historical Overview and First Annual Report, 1999. Management Data Series Number 182. Texas Parks and Wildlife Department, Coastal Fisheries Division. Austin, TX.
- Lam, Douglas. 2002. (Personal communication) Bayou City Fish Co. Houston, Texas.
- State of Texas. 1989. Parks and Wildlife Laws 1989-1990. West Publishing Co., St. Paul, MN.
- Texas Parks and Wildlife Department. 2001. Statewide Hunting and Fishing Proclamation 2001-2002. Texas Parks and Wildlife Department. Austin, TX.
- Treece, G. D. 1993. Texas Aquaculture: History and Growth Potential for the 1990s. 42 pp. Texas A&M Sea Grant publication GT-106. College Station, Texas

Table 1. Shrimp inspection records for 2002, summarized by individual facility.

Facility	Ponds cultured	Inspections (TPWD and Operator)	Samples submitted by TPWD	Samples submitted by Operator	Samples infected with NHP* (TPWD and Operator)	Samples infected with HE** (TPWD and Operator)	Samples infected with NHP+HE (TPWD and Operator)	Samples not infected (TPWD and Operator)	Samples infected with other disease (TPWD and Operator)
Arroyo Aquaculture	69	214	2	50	45	1	0	6	0
Austwell Aqua Farm	22	39	0	0	0	0	0	0	0
Bowers Shrimp Farm	83	511	3	0	0	0	0	3	0
Harlingen Shrimp	23	168	0	9	7	1	0	1	0
Loma Alta	18	62	0	12	0	4	0	8	0
R&G Shrimp Farm	26	123	4	0	0	0	0	4	0
Southern Star, Inc	158	662	2	60	32	0	0	30	0
St. Martin Seafood	44	91	0	1	0	0	0	1	0
Texas Sea Breeze	14	37	0	2	0	2	0	0	0
TAES-Flour Bluff	5	7	0	0	0	0	0	0	0
TSTC	1	1	0	0	0	0	0	0	0
Total	463	1,915	11	134	84	8	0	53	0

* NHP = Necrotizing Hepatopancreatitis

** HE = Hemocytic Enteritis

Table 2. Shrimp farm production hectares (ha) and yields in Texas, 1990-2002. (Data from 1990-1998 were modified from Treece 1993).

Year	Pond area (ha.)*	Yield (million kg**)	Yield/ha	Value (million dollars)	Dollars/ha
1990	175	0.62	3,564	4.00	22,857
1991	309	0.75	2,440	4.70	15,210
1992	463	1.74	3,772	11.00	23,758
1993	569	1.91	3,371	11.20	19,683
1994	420	1.85	4,421	12.80	30,476
1995	638	0.72	1,131	3.80	5,956
1996	426	0.89	2,093	6.00	14,084
1997	480	1.12	2,338	11.49	23,937
1998	549	1.44	2,628	9.68	17,632
1999	689	2.40	3,495	16.40	23,803
2000	879	2.56	2,916	18.60	21,160
2001	1,165	3.53	3,032	19.80	16,996
2002	1,225	3.76	3,067	17.37	14,171

Note: * 1 ha = 2.47 acres

Note: ** 1 kg = 2.2 pounds

Table 3. Comparison of the shrimp disease inspection results, 1999-2002.

Year	Inspections	Samples Submitted by TPWD	Samples Submitted by Operator	Samples infected with Taura	Samples infected with NHP	Samples infected with HE	Samples infected with NHP+HE	Samples infected with other diseases *	Samples submitted, not infected
1999	747	50	112	25	76	5	0	0	56
2000	1,113	33	152	0	87	17	8	7	66
2001	1,406	23**	158	0	74	32	27	4	43
2002	1,781	11	134	0	84	8	0	0	53
Total	5,047	117	556	25	321	62	35	11	218

* Vibriosis and/or bacterial septicemia

** One sample was lost

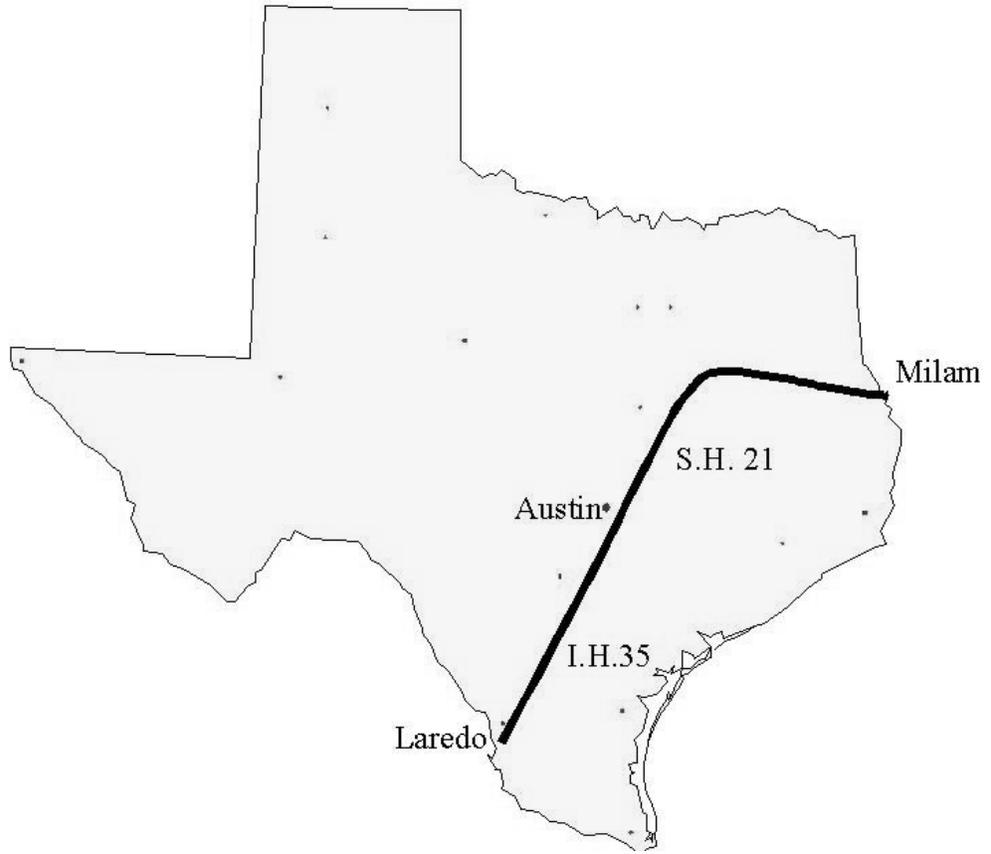


Figure 1. Exotic Species Exclusion Zone

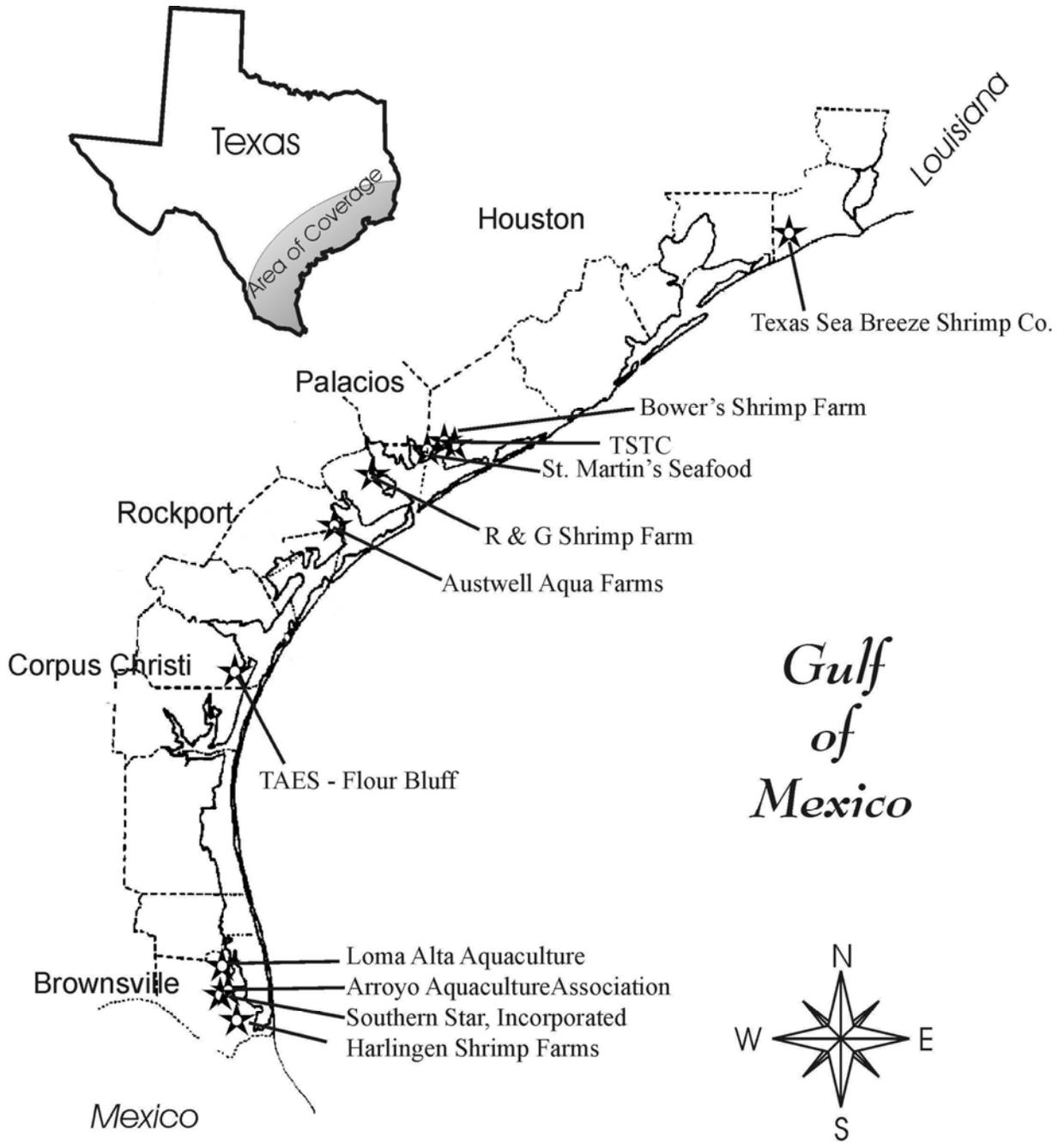


Figure 2. Location of shrimp farms in Texas for 2002.

Appendix A. Exotic Species Culture Facility Inspection Report

TEXAS PARKS AND WILDLIFE DEPARTMENT
EXOTIC SPECIES CULTURE FACILITY INSPECTION REPORT

Culturist's Name: _____ Date: _____
 Company: _____ Time: _____
 Address: _____ Phone: (Work) _____
 _____ Phone: (Home) _____
 Facility Location: _____

Fish Farmer License Number _____ TPWD Exotic Species Permit Number _____

- | | YES | NO |
|--|-------|-------|
| 1. Does the culturist possess a current Exotic Species Permit? | _____ | _____ |
| 2. Are transport vehicles, trailers, or semi-trailers properly marked (Fish, Tilapia, etc.) or are removable signs available? | _____ | _____ |
| 3. Are holding and culture containers escape proof? | _____ | _____ |
| 4. Are at least 3 screens capable of capturing the smallest specimen of each permitted exotic species in place between the rearing facility and any public waters? | _____ | _____ |
| 5. If facility is located within the Exotic Species Exclusion Zone , has the applicant submitted an EMERGENCY PLAN to the Department? | _____ | _____ |
| 6. Is the facility above the 100-year flood plain? | _____ | _____ |
| 7. If within the 100-year flood plain, has an acceptable flood protective dike been constructed to at least a height of one foot above the 100 year flood elevation? (Culturist must provide copies of HUD flood plain maps or elevations determined by a certified engineer). | _____ | _____ |
| 8. Does the facility have reasonable security measures to prevent theft or accidental release of Exotic Species? | _____ | _____ |
| 9. If Tilapia are held at this facility, have they been certified as Blue Tilapia, Nile Tilapia, Mozambique Tilapia or hybrids between these species? | _____ | _____ |

- 10. If exotic shellfish are held at this facility, have they been certified as being disease free by an approved disease specialist? _____
- 11. Is facility designed such that a discharge of waste into or adjacent to state waters will, or is likely to occur? (If yes, applicant must obtain the appropriate wastewater discharge authorization or exemption from the Texas Natural Resources Conservation Commission). _____

.....
 CERTIFICATION COMMENTS

() Approval Recommended () Approval Not Recommended

Explain deficiencies, if any: _____

Other Comments: _____

Second Inspection Required: Y () N ()

 Certifying TPWD Staff

 TNRCC Representative

 Title

 Title

 Signature

 Signature

CULTURIST (Permit Holder)

I agree to correct the deficiencies noted above (if any) within _____ days and maintain the facilities at or above Department standards.

 Signature

 Date

Appendix B. Clinical Analysis Checklist

TEXAS PARKS AND WILDLIFE DEPARTMENT
4200 SMITH SCHOOL ROAD. AUSTIN, TEXAS 78744
512-389-4800

CLINICAL ANALYSIS CHECKLIST

Facility location: _____
Water body/system type: ___ pond ___ indoor outdoor tanks ___ re-circulating ___ other
Culture unit description (number, letter, etc.) _____
Stage and date of stocking: PL _____ (day) and _____ (date)
Date of disease manifestation: _____
Duration of effect (days, hours since beginning): _____
Severity of problem: ___ total ___ heavy ___ moderate ___ light ___ not determined
Extent of problem: ___ One water system ___ Multiple systems, explain: _____

Type/size of animal affected:
Litopenaeus vannamei (age post-stock, weight, length or etc.) _____
Other animals affected, explain: _____

Abnormalities or manifestations observed in a random sample consisting of a minimum of 50 animals. Sample size _____ (Report number of occurrences for first 7 characteristics.)

- Characteristics:
- | | |
|---|---|
| 1. Gut empty _____ | 6. Gill discoloration _____ |
| 2. Emaciation _____ | 7. Shell or underlying skin with gross pathology typical of virus infection _____ |
| 3. Rostral deformity _____ | 8. Heavy or unusual predator activity _____ |
| 4. Digestive gland atrophy/necrosis _____ | 9. Erratic swimming observed _____ |
| 5. Shell fragile or atypically soft _____ | |

Remarks (include event history, observations of water quality, if manifestation of disease is present or not present and time since last feeding):

Necessity of Laboratory examination: ___ Submit for lab test ___ Submission Unnecessary
Reporting examiner (print): _____
Agency mailing address: _____

Date of report

Signature of reporting examiner

Appendix C. Harmful or Potentially Harmful Exotic Fish, Shellfish, and Aquatic Plants

HARMFUL OR POTENTIALLY HARMFUL EXOTIC FISH,
SHELLFISH, AND AQUATIC PLANTS

The new rules are adopted under Parks and Wildlife Code, Chapter 66, Subchapter A, §66.007 which gives the commission authority to regulate the possession and sale of exotic fish and shellfish.

§57.111. Definitions.

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

- (1) Aquaculture or fish farming--The business of producing and selling cultured species raised in private facilities.
- (2) Certified Inspector--An employee of the Texas Parks and Wildlife Department or the Texas A&M Sea Grant College Program who has satisfactorily completed a department approved course in clinical analysis of shellfish.
- (3) Cultured species--Aquatic plants or wildlife resources raised under conditions where at least a portion of their life cycle is controlled by an aquaculturist.
- (4) Clinical Analysis Checklist--An inspection form provided by the department specifying sampling protocols and listing certain characteristics which may constitute manifestations of disease.
- (5) Department--The Texas Parks and Wildlife Department or a designated employee of the department.
- (6) Director--The executive director of the Texas Parks and Wildlife Department.
- (7) Disease--Contagious pathogens or injurious parasites which may be a threat to the health of natural populations of aquatic organisms.
- (8) Disease-Free--A status, based on the results of an examination conducted by a department approved shellfish disease specialist that certifies a group of aquatic organisms as being free of disease.
- (9) Exotic species--A nonindigenous plant or wildlife resource not normally found in public water of this state.
- (10) Fish farm--The property including all drainage ditches and private facilities from which cultured species are produced, held, propagated, transported, or sold.
- (11) Fish farm complex--A group of two or more separately owned fish farms located at a common site and sharing privately owned water diversion or drainage structures.
- (12) Fish farmer--Any person engaged in aquaculture or fish farming.
- (13) Grass carp--The species *Ctenopharyngodon idella*.
- (15) Harmful or potentially harmful exotic shellfish--
 - (A) Crayfishes Family: Parastacidae--all species of the genus *Astacopsis*;
 - (B) Mitten crabs Family: Grapsidae--all species of genus *Eriocheir*;

- (C) Giant Ram's-horn Snails Family: Pilidae (synonymous with Ampullariidae)--all species of genus *Marisa*;
- (D) Zebra Mussels Family: Dreissenidae--all species of genus *Dreissena*;
- (E) Penaeid Shrimp Family: Penaeidae--all species of genus *Litopenaeus* and *Farfantepenaeus* except *L. setiferus*, *F. aztecus* and *F. duorarum*.
- (F) Pacific Oyster Family: Ostreidae--*Crassostrea gigas*.
- (G) Apple snails Family: Ampullariidae—Channeled Apple snail (*Pomacea canaliculata*).
- (17) Harmful or potentially harmful exotic species exclusion zone--That area south of SH 21, from its intersection with the Texas/Louisiana border, approximately five miles due east of Milam, Texas, not including that area of Brazos County south of SH 21, to San Marcos; thence south of IH 35 to Laredo.
- (18) Immediately--Without delay; with no intervening span of time.
- (19) Manifestations of disease--Manifestations of disease include, but are not limited to, one or more of the following: heavy or unusual predator activity, empty guts, emaciation, rostral deformity, digestive gland atrophy or necrosis, gross pathology of shell or underlying skin typical of viral infection, fragile or atypically soft shell, gill fouling, or gill discoloration.
- (20) Nauplius or nauplii--A larval crustacean having no trunk segmentation and only three pairs of appendages.
- (21) Operator--The person responsible for the overall operation of a wastewater treatment facility.
- (22) Place of business--A permanent structure on land where aquatic products or orders for aquatic products are received or where aquatic products are sold or purchased.
- (23) Postlarva--A juvenile crustacean having acquired a full complement of functional appendages.
- (24) Private facility--A pond, tank, cage, or other structure capable of holding cultured species in confinement wholly within or on private land or water, or within or on permitted public land or water.
- (25) Private facility effluent--Any and all water which has been used in aquaculture activities.
- (26) Private pond--A pond, tank, lake, or other structure capable of holding cultured species in confinement wholly within or on private land.
- (27) Public aquarium--An American Association of Zoological Parks and Aquariums accredited facility for the care and exhibition of aquatic plants and animals.
- (28) Public waters--Bays, estuaries, and water of the Gulf of Mexico within the jurisdiction of the state, and the rivers, streams, creeks, bayous, reservoirs, lakes, and portions of those waters where public access is available without discrimination.
- (29) Quarantine condition--Confinement of exotic shellfish such that neither the shellfish nor the water in which they are or were maintained comes into contact with other fish or shellfish.

(31) Waste--Waste shall have the same meaning as in Chapter 26, §26.001(6) of the Texas Water Code.

(32) Water in the state--Water in the state shall have the same meaning as in Chapter 26, §26.001(5) of the Texas Water Code.

(33) Wastewater treatment facility--All contiguous land and fixtures, structures or appurtenances used for treating wastewater pursuant to a valid permit issued by the Texas Natural Resource Conservation Commission.

§57.112. General Rules.

(a) Scientific reclassification or change in nomenclature of taxa at any level in taxonomic hierarchy will not, in and of itself, result in redefinition of a harmful or potentially harmful exotic species.

(b) Except as provided in §57.113 of this title (relating to Exceptions), it is an offense for any person to release into public waters, import, sell, purchase, transport, propagate, or possess any species, hybrid of a species, subspecies, eggs, seeds, or any part of any species defined as a harmful or potentially harmful exotic fish, shellfish, or aquatic plant.

(c) Violation of any provision of a permit issued under these rules is a violation of these rules.

§57.113. Exceptions.

(a) A person who holds a valid Exotic Species Permit issued by the department may possess, propagate, sell and transport to the permittee's private facilities exotic harmful or potentially harmful fish, shellfish and aquatic plants only as authorized in the permit provided the harmful or potentially harmful exotic species are to be used exclusively:

- (1) as experimental organisms in a department approved research program; or
- (2) for exhibit in a public aquarium approved for display of harmful or potentially harmful exotic fish, shellfish and aquatic plants.

(b) A person may possess exotic harmful or potentially harmful fish or shellfish, exclusive of grass carp, without a permit, if the intestines of the fish or shellfish have been removed.

(e) A fish farmer who holds a valid exotic species permit issued by the department may possess, propagate, transport, or sell Pacific white shrimp (*Litopenaeus vannamei*) provided the exotic shellfish meet disease free certification requirements listed in §57.114 of this title (relating to Health Certification of Exotic Shellfish) and as provided by conditions of the permit and these rules.

(i) A licensed retail or wholesale fish dealer is not required to have an exotic species permit to purchase or possess:

(1) live individuals of species or hybrids of species listed in subsection (d) of this section held in the place of business, unless the retail or wholesale fish dealer propagates one or more of these species. However, such a dealer may sell or deliver these species to another person only if the intestines or head of the fish are removed; or

(2) Live Pacific white shrimp (*Litopenaeus vannamei*) held in the place of business if the place of business is not located within the Harmful or Potentially Harmful Exotic

Species Exclusion Zone. However, such a dealer may only sell or deliver this species to another person if the shrimp are dead and packaged on ice or frozen.

(l) A fish farmer who holds a valid exotic species permit issued by the department may possess, propagate, transport and sell Pacific blue shrimp (*Litopenaeus stylirostris*) provided the exotic shellfish are cultured under quarantine conditions in private facilities located outside the harmful or potentially harmful exotic species exclusion zone, and meet disease free certification requirements listed in §57.114 of this title (relating to Health Certification of Exotic Shellfish) and as provided by conditions of the permit and these rules.

§57.114. Health Certification of Exotic Shellfish.

(a) All disease free certification of exotic shellfish must be conducted by a shellfish disease specialist approved by the department.

(b) Any person importing live exotic shellfish from facilities outside the state must prior to importation:

(1) provide documentation to the department that the shellfish to be imported have been inspected and certified as disease-free by a department-approved shellfish disease specialist; and

(2) receive acknowledgment from the department that the requirements of paragraph (1) of this subsection have been met.

(c) Any person in possession of exotic shellfish for the purpose of production of postlarvae must provide to the department monthly certification that nauplii and postlarvae have been examined and are certified to be disease-free. If certification cannot be provided, the exotic shellfish must be maintained in quarantine condition until the department acknowledges in writing that the stock is disease-free or specifies in writing condition(s) under which the quarantine can be removed.

(d) Any person in possession of exotic shellfish stocks who observes one or more of the manifestations of disease appearing on the clinical analysis checklist provided by the department shall:

(1) immediately quarantine the entire facility, immediately notify the department and immediately request an inspection from a department approved examiner; or

(2) immediately quarantine the entire facility, immediately notify the department and immediately submit samples of the affected shellfish to a department approved shellfish disease specialist for analysis. Results of such analyses shall be forwarded to the department immediately upon receipt.

(e) Upon receiving a request from a permit holder under subsection (d)(1) of this section, the department approved examiner shall inspect the private facility, complete the clinical analysis checklist provided by the department, and submit copies of the checklist to the department and the permit holder.

(f) Before discharging any waste for the first time in any calendar year into or adjacent to water in the state, the permittee shall:

(1) have a department approved examiner inspect the entire facility and examine samples of the shellfish from each pond or other structure containing exotic shellfish no

more than 72 hours prior to the first discharge and shall submit the results of the examination to the department on the department approved clinical analysis checklist; or

(2) submit samples of the shellfish from each pond or other structure containing exotic shellfish to a department approved shellfish disease specialist for analysis no more than ten days prior to the first discharge and submit the results of such analyses to the department immediately upon receipt.

(g) If the results of an inspection performed under subsection (f)(1) of this section indicate the presence of one or more manifestations of disease, the permittee shall immediately place the entire facility under quarantine and immediately submit samples of the shellfish from the affected portion(s) of the facility to a department approved shellfish disease specialist for analysis. Results of such analyses shall be forwarded to the department immediately upon receipt.

(h) If the results of analyses performed under subsection (f)(2) of this section indicate the presence of disease, the permittee shall immediately place the entire facility under quarantine.

(i) A private facility quarantined under subsections (d), (g) or (h) of this section shall remain under quarantine condition until the department removes the quarantine in writing or authorizes in writing other actions deemed appropriate by the department based on the required analyses.

(j) If the results of inspections or testing performed under subsection (f) of this section indicate the absence of any manifestations of disease, the permittee may begin discharging from the facility.

§57.115. Transportation of Live Exotic Species.

(a) Transport of live harmful or potentially harmful exotic species is prohibited except by:

(1) a fish farmer in possession of a valid Exotic Species Permit and an exotic Species Transport Invoice;

(2) a commercial shipper acting for the permit holder in possession of an Exotic Species Transport Invoice;

(3) persons holding exotic species pursuant to limitations of §57.113 of this title (relating to Exceptions).

§57.116. Exotic Species Transport Invoice.

(a) An exotic species transport invoice shall contain all the following information correctly stated and legibly written: invoice number; date of shipment; name, address, and phone number of the shipper; name, address, and phone number of the receiver; fish farmer's Aquaculture license number and exotic species permit number, if applicable; number and total weight of each harmful or potentially harmful exotic species; a check mark indicating interstate import, interstate export, or intrastate type of shipment. A completed invoice shall accompany each shipment of harmful or potentially harmful exotic species sold or transferred, and shall be sequentially numbered during the permit period; no invoice number shall be used more than once during any one permit period by the permittee.

(b) The exotic species transport invoice shall be provided by the permittee; one copy shall be retained by the permittee for a period of at least one year following shipping date and one copy shall be forwarded to the department's Exotic Species Program Leader.

(c) The permittee is responsible for supplying completed copies of the exotic species transport invoice to out-of-state dealers from which the permittee has purchased and or received harmful or potentially harmful exotic species, or to whom harmful or potentially harmful exotic species are transferred so that shipment will be properly marked and numbered upon delivery to the permittee in Texas.

§57.117. Exotic Species Permit: Fee and Application Requirements.

(a) The department shall charge a nonrefundable exotic species permit application fee as follows:

- (1) application for new, renewed, or amended exotic species permit which requires facility inspection--\$250;
- (2) application for renewed or amended exotic species permit requiring no facility inspection--\$25;
- (3) renewal applications received more than one year after the renewal date will require an additional inspection and cost \$250.

(b) To be considered for an Exotic Species Permit, the applicant shall:

- (1) meet one or more of the following criteria:
 - (A) possess a valid Aquaculture License;
 - (B) possess a valid permit from the Texas Natural Resource Conservation Commission authorizing operation of a wastewater treatment facility;
 - (C) possess a department approved research proposal involving use of harmful or potentially harmful exotic fish, shellfish or aquatic plants; or
 - (D) operate a public aquarium approved for display of harmful or potentially harmful exotic fish, shellfish or aquatic plants;
- (2) complete and submit an initial exotic species permit application on a form provided by the department;
- (3) submit an accurate-to-scale plat of the facility specifically including, but not limited to, location of:
 - (A) all private facilities and owner's name and physical address including a designation on the plat of all private facilities which will be used for possession of harmful or potentially harmful exotic species;
 - (B) all structures which drain private facilities;
 - (C) all points at which private facility effluent is discharged from the private facilities or the fish farm;
 - (D) all structures designed to prevent escapement of harmful or potentially harmful species from the fish farm;
 - (E) any vats, raceways, or other structures to be used in holding harmful or potentially harmful exotic species;

(4) demonstrate to the department that an existing fish farm, private facility or wastewater treatment facility meets requirements of §57.129 of this title (relating to Exotic Species Permit: Private Facility Criteria);

(5) remit to the department all applicable fees.

(c) Applicants for an exotic species permit for culture of harmful or potentially harmful exotic shellfish must meet all exotic species permit application requirements and requirements for disease free certification as listed in §57.114 of this title (relating to Health Certification of Exotic Shellfish).

(d) An applicant for an exotic species permit shall provide upon request from the department documentation necessary to identify any harmful or potentially harmful exotic species and confirm the source of origin for the species for which a permit is sought.

(e) An applicant for an Exotic Species Permit whose facility is located within the harmful or potentially harmful exotic species exclusion zone as defined in §57.111 of this title (relating to Definitions) must submit an Emergency Plan to the department for review and approval. The plan shall include measures sufficient to prevent release or escapement of permitted harmful or potentially harmful exotic species into public water during a natural catastrophe (such as a hurricane or flood).

§57.118. Exotic Species Permit Issuance.

(a) The department may issue an Exotic Species Permit only to:

(1) a fish farmer and only for species listed in §57.113(c)-(e) of this title (relating to Exceptions);

(2) a wastewater treatment facility operator;

(3) department approved research programs; or

(4) a public aquarium for display purposes only.

(b) The department may issue an exotic species permit upon a finding by the department that:

(1) all application requirements as set out in §57.117 of this title (relating to Exotic Species Permit: Fee and Application Requirements) have been met;

(2) the fish farm operated by the applicant and named in the permit meets or will meet the design criteria listed in §57.129 of this title (relating to Exotic Species Permit: Private Facility Criteria);

(3) the applicant has complied with all provisions of the Parks and Wildlife Code, §66.007, §66.015, and these rules during the one-year period preceding the date of application.

(c) Permits issued for fish farms, private facilities or wastewater treatment facilities under construction shall not authorize possession of harmful or potentially harmful exotic fish, shellfish or aquatic plants until such time as the department has certified that the fish farm, private facilities or wastewater treatment facility as-built meets the requirements in §57.129 of this title (relating to Exotic Species Permit: Private Facility Criteria).

§57.119. Exotic Species Permit: Requirements for Permittee.

(a) A copy of the Exotic Species Permit shall be:

(1) made available for inspection upon request of authorized department personnel; and

(2) prominently displayed on the premises of the fish farm, private facilities or wastewater treatment facility named in the permit.

(b) Permittee must provide access to all facilities covered by the application to authorized department personnel during any hours in which operations pursuant to the exotic species permit are ongoing.

(c) If a permittee discontinues fish farming, research activities or public aquarium display involving harmful or potentially harmful exotic species or discontinues wastewater treatment, the permittee shall:

(1) immediately and lawfully sell, transfer or destroy all remaining individuals of that species in possession; and

(2) notify the department's Exotic Species Program Leader at least 14 days prior to cessation of operation.

(d) Upon a request, a permittee shall provide an adequate number of fish, shellfish, or aquatic plants to authorized department employees for identification and analyses.

(e) In the event that the fish farm, private facilities or a wastewater treatment facility of a permit holder appears in imminent danger of overflow, flooding, or release of harmful or potentially harmful exotic fish, shellfish or aquatic plants into public water, the permittee shall:

(1) immediately notify the department;

(2) immediately begin implementation of the department approved Emergency Plan.

(f) Except in case of an emergency, a holder of an exotic species permit authorizing possession of *Litopenaeus vannamei* must notify the department at least 72 hours prior to, but not more than seven days prior to any harvesting of permitted shellfish. In an emergency beyond the control of the permittee, notification of harvest must be made as early as practicable prior to beginning of harvest operations.

(g) A holder of an exotic species permit authorizing possession of harmful or potentially harmful exotic species may sell or transfer ownership of live individuals only to the holder of a valid exotic species permit specifically authorizing possession of transferred species.

(h) Upon discovery of release or escapement of harmful or potentially harmful exotic fish or shellfish from any private facilities authorized in an exotic species permit, the permittee must immediately halt discharge of all private facility effluent from the fish farm. If the permittee's private facility is located within a fish farm complex, upon discovery or release or escapement of harmful or potentially harmful fish or shellfish, the permittee must immediately halt discharge of all private facility effluent.

(i) A holder of an exotic species permit must notify the department's Exotic Species Program Leader in the event of escapement or release of harmful or potentially harmful exotic fish or shellfish, within two hours of discovery.

(j) All devices required in the exotic species permit for prevention of discharge of harmful or potentially harmful exotic fish, shellfish, or aquatic plants must be in place and properly maintained prior to and at all times such species are in possession.

(k) All private facility effluent discharged from a fish farm holding exotic harmful or potentially harmful species must be routed through all devices for prevention of discharge of exotic species as required in the permit.

(l) A permittee must notify the department's Exotic Species Program Leader in the event of change of ownership of the fish farm named in that permittee's exotic species permit. Notification must be made immediately.

(m) Permits are not transferable from site to site.

§57.120. Exotic Species Permit: Expiration and Renewal.

(a) Exotic Species Permits required by these rules expire on December 31 of the year issued.

(b) The department may renew an Exotic Species Permit upon finding that:

(1) the applicant has met application requirements in §57.117 of this title (relating to Exotic Species Permit: Fee and Application Requirements);

(2) the facility will meet all applicable facility design criteria listed in §57.129 of this title (relating to Exotic Species Permit: Private Facility Criteria);

(3) the applicant has complied with all provisions of the Parks and Wildlife Code §66.007, §66.015, and these rules during the one-year period preceding the date of agency action on the application for renewal; and

(4) the applicant has submitted a renewal application and all required annual reports to the department as required in §57.123(a) and (b).

§57.121. Exotic Species Permit-Amendment.

(a) Exotic species permits may be amended upon a finding by the department that:

(1) the applicant has complied with all provisions of the Parks and Wildlife Code, §66.007, §66.015, all conditions in permit, and these rules during the one-year period preceding the date of application;

(2) the applicant has met all applicable application requirements under §57.117 of this title (relating to Exotic Species Permit--Fee Application Requirements); and

(3) the facilities as altered will meet the private facility criteria in §57.129 of this title (relating to Exotic Species Permit).

(b) Exotic species permits must be amended to reflect any:

(1) addition or deletion of species of harmful or potentially harmful exotic fish, shellfish, or aquatic plants held pursuant to the permit;

(2) intended redistribution of harmful or potentially harmful fish, shellfish, and aquatic plants into private facilities not authorized in the permit;

(3) change in methods of preventing discharge of harmful or potentially harmful exotic fish, shellfish, and aquatic plants;

(4) change in discharge of private facility effluent from fish farms or wastewater treatment facilities; and

(5) change in existing design criteria listed in §57.129 of this title (relating to Exotic Species Permit-Private Facility Criteria).

(c) Applicants seeking amendment of exotic species permits, including those issued prior to January 23, 1992, must meet all application requirements listed in §57.117 of this title

(relating to Exotic Species Permit-Fee and Application Requirements) and facility design criteria listed in §57.129 of this title (relating to Exotic Species Permit-Private Facility Criteria).

§57.122. Appeal.

An opportunity for hearing shall be provided to the applicant or permit holder for any denial of an exotic species permit or a triploid grass carp permit or where the terms of issuance are different from those requested by the applicant.

(1) Requests for hearings shall be made in writing to the department no more than 30 days from receipt of the denial notification.

(2) All hearings shall be conducted in accordance with the rules of practice and procedure of the Texas Parks and Wildlife Department and the Administrative Procedure Act.

§57.123. Exotic Species Permit Reports.

(a) The Exotic Species Permit holder shall submit an annual report that accounts for importation, possession, transport, sale, transfer or other disposition of any harmful or potentially harmful exotic species handled by the permittee. This report shall be submitted on forms provided by the department with the application and shall be due January 10 of each year.

§57.129. Exotic Species Permit: Private Facility Criteria.

(a) The fish farm or wastewater treatment facility must be designed to prevent discharge of water containing adult or juvenile harmful or potentially harmful exotic species, their eggs, seeds or other reproductive parts from the permittee's property.

(b) Fish farms holding harmful or potentially harmful exotic fish or shellfish shall have at least three appropriately designed and constructed permanent screens placed between any point in the fish farm where harmful or potentially harmful exotic fish or shellfish are intended to be in water on the fish farm and the point where private facility effluent first leaves the fish farm.

(1) Screen mesh shall be of an appropriate size for each stage of exotic fish or shellfish growth and development.

(2) One screen must be permanently affixed in front of the final discharge pipe in the harvest structure and remain in place while the pond is in use. This screen and backing material must be of sufficient strength to withstand a water level differential of the height of the discharge area.

(3) At those facilities which discharge into public waters, one screen must be secured over the terminal end of the discharge pipe at all times. This screen must be secured in such a fashion as to prevent escape of permitted species. A second, additional screen must be secured over the terminal end of the discharge pipe during all harvest activities.

(4) Screens must be designed and constructed such that screens can be maintained and cleaned without reducing the level of protection against release of harmful or potentially harmful exotic fish or shellfish. The department may approve alternate methods of preventing discharge of harmful or potentially harmful exotic fish or shellfish upon a finding that those methods are at least as effective in preventing discharge of adult or juvenile harmful or potentially harmful exotic species, their eggs, or other reproductive parts from the permittee's property. The point of discharge of all mechanical harvesting devices must be double screened to prevent escapement of harmful or potentially harmful fish or shellfish.

(c) Fish farms which are to contain species or hybrids of species listed in §57.113 of this title (relating to Exceptions) and wastewater treatment facilities containing permitted exotic species which are within the 100-year flood plain, referred to as Zone A on the National Flood Insurance Program Flood Insurance Rate Map, must be enclosed within an earthen or concrete dike or levee constructed in such a manner to exclude all flood waters and such that no section of the crest of the dike or levee is less than one foot above the 100-year flood elevation. Dike design or construction must be approved by the department before issuance of a permit.

(d) Fish farms containing harmful or potentially harmful exotic shellfish shall be capable of segregating stocks of shellfish which have not been certified as free of disease from other stocks of shellfish on that fish farm.

(e) A fish farm containing harmful or potentially harmful exotic fish or shellfish must have in place security measures designed to prevent unrestricted or uncontrolled access to any private facilities containing harmful or potentially harmful exotic fish or shellfish. Security measures must prevent unauthorized removal of such species from the fish farm.

(f) For fish farms that are part of a fish farm complex, the following additional facility standards shall apply.

(1) Each permittee shall maintain in the common drainage at least one screen for preventing the movement of harmful or potentially harmful exotic fish or shellfish between the point where private facility effluent from the permittee's fish farm enters the common drainage and each point where an adjacent fish farmer's private facility effluent enters the common drainage. The adequacy of design and construction of such screens or other structures shall be determined by the department as provided in subsection (a)(1) of this section.

(2) Each permittee within the complex must have authority to stop the discharge of private facility effluent from the complex in the event of escapement or release of such fish or shellfish from that permittee's fish farm.

§57.130. Exotic Species Interstate Transport Permit.

(a) Transport of live harmful or potentially harmful exotic species originating from a point of origin outside the state of Texas and being transported through Texas to a destination outside of the state of Texas is prohibited except by the holder of an Exotic Species Permit or an Exotic Species Interstate Transport Permit.

(b) Anyone transporting live harmful or potentially harmful exotic species must provide documentation accounting, collectively, for all exotic species being transported.

§57.131. Exotic Species Interstate Transport Permit: Application and Issuance.

(a) The department shall charge a nonrefundable Exotic Species Interstate Transport Permit application fee of either:

- (1) \$25 for individual permits; or
- (2) \$100 for an annual permit.

(b) To apply for an Exotic Species Interstate Transport Permit an applicant shall:

- (1) complete and submit an Exotic Species Interstate Transport Permit application on a form provided by the department;
- (2) remit to the department's Exotic Species Program Leader all applicable fees.

(c) An applicant for an Exotic Species Interstate Transport Permit shall provide documentation upon request from the department necessary to identify any harmful or potentially harmful exotic species and source of origin of the species for which the permit is sought.

(d) The department may issue an Exotic Species Interstate Transport Permit upon a finding that all provisions of subsections (a)-(c) of this section have been met.

§57.132. Exotic Species Interstate Transport Permit: Permittee Requirements.

(a) A copy of the Exotic Species Interstate Transport Permit shall be made available for inspection immediately upon request of authorized department personnel.

(b) Permittee must provide access to shipments of exotic species to authorized department personnel during the effective date of the permit.

(c) Permittee must notify the department's Exotic Species Program Leader in writing or by facsimile transmission at least 72 hours prior to transport of live harmful or potentially harmful exotic species indicating transport date, intended transportation route, and name and physical address of recipient.

(d) While transporting harmful or potentially harmful exotic species within the state of Texas, a holder of an Exotic Species Interstate Transport Permit must notify the department's Exotic Species Program Leader in the event of escapement or release of harmful or potentially harmful exotic species within two hours of release.

(e) Except as provided by the terms and conditions of the Exotic Species Interstate Transport Permit, offloading or transfer of shipments of harmful or potentially harmful exotic species in the state of Texas is prohibited.

§57.133. Exotic Species Interstate Transport Permit: Expiration and Renewal.

(a) Exotic Species Interstate Transport Permits expire as stated on the permit.

(b) A separate Exotic Species Interstate Transport Permit must be issued for each vehicle, trailer or other such transporting unit when transporting live harmful or potentially harmful species through the state.

§57.134. Wastewater Discharge Authority.

(a) An applicant for an initial exotic species permit must provide the following:

(1) written documentation demonstrating that the applicant possesses the appropriate valid wastewater discharge authorization or has received an exemption from the Texas Natural Resource Conservation Commission if the fish farm, fish farm complex or private facility is designed such that a discharge of waste into or adjacent to water in the state will, or is like to occur; or

(2) adequate documentation to demonstrate that the facility is designed and will be operated in a manner such that no discharge of waste into or adjacent to water in the state will, or is likely to occur.

(b) An applicant for an amendment or a renewal of an exotic species permit must provide the following:

(1) written documentation demonstrating that the applicant possesses or has timely applied for and is diligently pursuing the appropriate wastewater discharge authorization or exemption from the Texas Natural Resource Conservation Commission in accordance with 30 TAC Chapter 321, Subchapter O, if the fish farm, fish farm complex or private facility is

designed such that a discharge of waste into or adjacent to water in the state will, or is likely to occur; or

(2) adequate documentation to demonstrate that the facility is designed and will be operated in a manner such that no discharge of waste into or adjacent to water in the state will, or is likely to occur.

(c) An exotic species permittee whose wastewater discharge authorization or exemption is revoked, suspended or annulled by the Texas Natural Resource Conservation Commission will be treated as an applicant for an initial permit under subsection (a) of this section.

§57.135. Memorandum of Understanding between the Texas Parks and Wildlife Department and the Texas Natural Resources Conservation Commission.

The Texas Parks and Wildlife Department (TPWD) incorporates by reference the memorandum of understanding between the Texas Natural Resource Conservation Commission (TNRCC) and the TPWD as published in the January 3, 1997, edition of the Texas Register (22 TexReg 24) and as adopted by the TNRCC on July 22, 1997.

§57.136. Penalties.

The penalties for violation of this subchapter are prescribed by Parks and Wildlife Code, §66.012.