Oyster Damage Evaluation Board General Guidelines for Conducting Oyster Lease Biological Surveys Directed by the Board

Introduction

The purpose of these general oyster lease biological sampling guidelines is to give some consistency to the collection of and recording of data collected during biological oyster lease surveys. These surveys are carried out by Oyster Lease Damage Evaluation Board certified biologists under the terms of providing the Board with relatively consistent survey reports to enable the Board to hear cases for arbitration. The Board is proposing these sampling guidelines under the authority of the certification process and the rules under which the Oyster Lease Damage Evaluation Board operates.

These general oyster lease sampling guidelines were comprised of recommendations by Board certified oyster biologists submitted in writing and in person before the Board during the spring and early summer of 1998. These recommendations were compiled and the Board agreed on a semi-final draft sampling protocol in May 1998. These Guidelines were therefore based on input from a majority (eight) of the certified oyster biologists. All recommendations from the certified biologists were not incorporated. Some recommendations were conflicting and the Board made the final decision as to what to include in the final protocol.

It should be noted that these guidelines adopted by the Oyster Lease Damage Evaluation Board are general oyster lease sampling guidelines and protocols to be followed by the Board certified oyster biologists when they are performing biological surveys of oyster leases for purposes of the arbitration of cases brought before the Board. While the Board has made every attempt to make these guidelines flexible and has provided ranges of parameters within which to perform a survey, the burden of proof is on the oyster biologist to justify any significant deviations (>20%) from these guidelines to the Board when reports are made to the Board. The Board will take into consideration any deviations and related justifications presented when deciding cases brought before the board.

Bottom Substrate Sampling

Utilize the poling technique along Global Positioning System (GPS) determined transects, the assigned biologist will survey that area of the lease determined by the Board to be within a potential impact area. The minimum area to be surveyed follows guidelines maintained by the Louisiana Department of Wildlife and Fisheries (LDWF) (Appendix A). This minimum survey area may be expanded, but not reduced, according to the Board and professional judgment of the assigned biologist. A range of 120 to 300 ft. will be used for transect distances, depending upon the lease area to be surveyed. Transects should be no farther than 120 ft. apart for any

survey area less than 20 acres in size. If the survey area is larger (>100 acres), the transects should be no farther than 300 ft. apart. Bottom probes (individual poling samples) should be 20 - –40 ft. apart, depending upon the lease size and water depth. The information from the bottom survey will be used to make a bottom substrate map with the transect locations marked on the map. The substrate categories mapped should include reef, cultch, buried shell, hard mud, soft mud and sand (from the Sammy Ray report, 1996). Note: In the case of a small very narrow lease (< 100 ft. wide) such as one located in a meandering bayou, the professional judgment of the biological oyster lease consultant should be used concerning the number and spacing of transects. The biologist may change these distances slightly if field conditions and his/her best professional judgment warrant. If distances changed more than 20%, the biologist must justify the change to the Board.

Standing Crop Sampling

A minimum of three (3) 1.0 sq. meter (1.1 sq. yard) samples or the equivalent number, by area, of 0.25 to 1.0 sq. meter samples will be taken at each of a minimum of three (3) locations most likely to contain living oysters within the lease (only 3 sample locations are necessary unless a lease is very large or has several productive areas). Al surface materials within the sampling frame (in the quadrat method is used) to a depth of 6 inches will be collected. Surface materials may be collected by means other than 0.25 to 1 square meter quadrats such as by oyster dredges, tongs or other reasonable quantitative sampling methods. The Board permits and encourages the use of mechanical tongs (if permitted by the LDWF) as a viable alternative to SCUBA or other methods. At least three (3) replicate samples per location should be taken with these other methods. The samples will be photographed in the field and the samples measured and the oysters classified into living and recently (fresh dead) dead oysters and boxes within one week if kept under refrigeration. Measurements of oyster shells will be done in size groups; > 3 inches (7.6 cm), 2 (5 cm) to 3 inches (7.6 cm), and < 2 inches (5 cm). (See the attached Glossary for definitions of the “fresh boxes” and “fresh valves” category.)

Lease Potential Methodology

Maximum standing oyster crop estimates can be made by taking the percentage of reef and shell bottom types on a lease and combining this percentage with square meter/tonging/dredge or other oyster density data collected from areas most likely to contain living oysters on the lease. A sack count of 190 oysters/sack, regardless of size class, will be used as a measure to represent densities of living oysters on the lease. These “sack counts” will be discounted due to some mortality or other percentage calculated by the Oyster Lease Damage Evaluation Board, not the oyster biologist. The exception is that oysters 3 inches and greater in size should have an undiscounted sack count of 190 oysters/sack and be called marketable oysters. Oysters 2 to 3” and less than 2 inches in size should have a sack count of 190 oysters/sack and be called potential marketable oysters. Adjustments will be made to calculate the lease potential per sack for all size groups by considering: (1) natural mortality, (2) the history of the use of the lease, (3) the current market price, (4) the harvest cost, and other factors.

Data Management

All information obtained from the lease survey should be included in the survey report. This should include field data sheets, tabulated results, photographs of samples, environmental conditions at the time of survey (i.e., water temperature, salinity, ambient temperature, water depth, etc.), size frequency graphs (histograms), maps of the lease and impact area, and other pertinent information necessary for determining lease productivity. The bottom substrate maps will contain: (1) the transect locations, (2) bottom substrates, and (3) bathymetric contours marked on the maps.

Acknowledgements

The Oyster Lease Damage Evaluation Board would like to acknowledge the assistance given by the eight (8) certified oyster biologists in providing recommendations for use in this general sampling protocol: Mr. Bud Brodtman, Dr. Ed Cake, Mr. John Cirino, Dr. Ron Kilgen, Dr. Earl Melancon, Dr. Maureen Mulino, Mr. Mike Rayle, and Mr. Rick Waldron.

Oyster Glossary

Adopted by the Oyster Lease Damage Evaluation Board

1. **OYSTER SIZE CATEGORIES:** Three size categories of oysters are recognized, however, the Board has chosen the size categories of > 3 in, 2 – 3 inches and < 2 inches for use in reports to the Board. The three general oyster size classes follow: **SPAT** oysters are recently metamorphosed and attached oysters less than 1 inch ($\leq$ 24 mm) in size with very thin shells that generally conform to the surface upon which they are growing. **SEED** oysters are medium oysters from 1 to just less than 3 inches (25 to 75 mm) in size that are traditionally transplanted from state seed grounds to private oyster leases or bedding grounds in Louisiana. **SACK** oysters are harvestable size of 3 inches or greater ($\geq$ 76 mm) traditionally used to "make sacks" in Gulf Coast States.

2. **LIVE OYSTERS**: Those oysters that have tightly closed shells that sound solid when struck with any implement and that contain the live mollusk and its shell liquor when opened.

3. **GAPERS or MORIBUND OYSTERS**: Those oysters that have lost their ability to stay tightly closed, have lost their shell liquor, and sound hollow when struck by a small implement.

4. **BOXES or BOX OYSTERS**: those empty oyster shells that are still joined via the hinge mechanism at the umbo region and that resonate with a hollow sound when struck with a small implement.

5. **FRESH BOXES**: Those paired oyster valves that may or may not have oyster tissue residues within the shells, that have complete (unbroken, noneroded) ventral margins, and that have no fouling organisms (e.g., acorn barnacles, slipper shells, hooked mussels, oyster spat, bryozoan colonies, etc.) attached to the inside of the freshly exposed interior shell surfaces. Depending on the time of the oyster's death they may remain free of colonizing invertebrate animals for several days to several weeks (in summer) to several months (in winter).

6. **OLD BOXES**: Those paired oyster valves that are fouled inside with acorn barnacles, slipper shells hooked mussels, oyster spat, bryozoan colonies, etc., and represent those oysters that died within the previous two (2) years [Christmas, et al., 1997, reported an average shell disarticulation period of 739.4 days (2 years)].

7. **FRESH VALVES**: Those clean, separated valves that represent fresh dead oysters whose shells were disarticulated during predation, physical trauma, sample dredging, etc. Fresh

valves have clean, unfouled interior shell surfaces with an opalescent appearance characteristic of freshly opened live oysters and complete ventral shell margins. Counts of fresh valves are generally based on the total number of left (or cupped) valves.

8. **FOULING ORGANISMS**: Those epifaunal invertebrates (e.g., acorn barnacles, slipper shells, hooked mussels, oyster spat, bryozoan colonies, etc.) that colonize the inside and outside of newly exposed oyster shells, They primarily settle or attach between April and October and their presence on the inside of oyster shells is clear evidence that the oysters died more than 4 to 6 weeks in winter or only 1 week in summer prior to collection. The densities of the fouling organisms range from **SPARSE** (or light) with few organisms on the exposed shell surfaces, through **MODERATE** with numerous organisms covering approximately one-half of the available surfaces, to **DENSE** (or heavy) with abundant organisms covering most or all of the available shell surfaces.

9. **BORING ORGANISMS:** Those endofaunal invertebrates (e.g., yellow boring sponges, paddock or boring clams, boring barnacles, etc.) that bore into the shell matrices of "live" and "dead" oyster shells. Those organisms eventually reduce bedded and natural oysters and cultch shells to shellhash or "grit" that is characteristic of reef margins and overharvested lease areas. The density of boring organisms can also be defined in terms of **SPARSE**, **MODERATE** and **DENSE**.

10. **OYSTER PREDATORS:** Common oyster predators in the northern Gulf of Mexico include flatworms or "*oyster leeches*" (*stylochus spp*.), the southern oyster drill, oyster borer, or rock shell (*Thais* [*Stramonia*] *haemastoma*), the stone crabs (*Menippe mercenaria* and *M. adina*), the blue crab (*Callinectes sapidus*), the black drum (*Pogonias cromis*), and the cownose ray (*Rhinoptera bonasus*). Depending on the species, these predators narcotize, drill, and/or crush and consume all sizes of oysters: however, they are normally restricted to coastal waters in salinities above 15 ppt.

11. **OYSTER DISEASE**: The principal oyster disease or pathogen in the northern Gulf of Mexico is the protozoan parasite, *Perkinsus marinus* (or **Dermo**). That disease may kill 50% or more of the mature, spawned-out, or physiologically weakened oysters in high-salinity warm waters during late summer and early autumn in any given year. Late-summer Dermo mortalities are common in high-salinity waters of coastal Louisiana.

12. **OTHER MORTALITY FACTORS**: Other natural and anthropogenic (man-induced) factors that often cause oyster mortalities in shallow coastal waters of the Gulf of Mexico include **freshwater floods** or "freshets" that lower water salinities less than 5 ppt for extended periods in traditional oyster producing areas; **adverse sedimentation** (sometimes associated with dredge and fill projects, vessel groundings, and/or propeller turbulence or prop-washing) that buries and smothers all sizes of oysters depending on the volume of sediments displaced and the thickness of the resulting sediment lens: and **seismic activities** (explosive methods associated with hydrocarbon exploration) that may bury oysters in very localized areas.

13. **BLACKENED SHELLS:** Oyster shells that are buried in organically rich sediments under anaerobic conditions are blackened by ferric or metallic sulfides, a black dyelike substance. The ferric/metallic sulfides penetrate the shell matrices giving them a distinctive black coloration. Normal oyster shells tat are bathed with well-oxygenated water are generally light-brown in color; but the bottom of those oysters may be blackened when in direct contact.

(The Board thanks Dr. Ed Cake for providing the above glossary.)

Approved 8-26-98
Revised 9-30-98
Revised 1-26-2004

Appendix A

Minimum Area Guidelines for Conducting Oyster Lease Biological Surveys
(Adopted from Permit guidelines of the Louisiana Department of Wildlife and Fisheries)

The guidelines listed below illustrate the areas that may potentially be damaged as a result of mineral activities occurring within a certain proximity to oyster leases. These distances are to be used as the minimum area necessary to conduct oyster lease surveys according to the respective mineral activity. These survey areas may be expanded, but not reduced, according to the professional judgment of the assigned biologist.

The minimum oyster lease survey requirements are as follows:

Jetting/Trenching a pipeline 6 inches or less in diameter -	500 ft on both sides of activity
Jetting/Trenching a pipeline greater than 6 inches in diameter -	1500 ft on both sides of activity
Dredging (bucket) activities -	1500 ft on both sides of activity
Prop washing –	0.5 mile radius from activity

Activities not listed will have the survey area determined by the best professional judgment of the assigned biologist, who will account for the purpose and technology utilized in the mineral activity as well as the physical environment surrounding the activity and lease.

INITIAL BIOLOGICAL SURVEY
SUMMARY

_____
Board Reference Number
(for Board use only)

Estimated standing crop by size groups

Bottom type	Percent of type	Number of acres	>3"	2" to 3"	<2"
Total	Total	Total			

Total acres_____

(1) What is the estimated production potential for the impacted portion of the lease?

(2) What is the current wholesale value dockside on a per sack basis for similar oysters?

(3) What are the expected costs to the harvester on a per sack basis (based on actual costs)?

(4) What is the estimate of production potential, including bottom and crop, expected to be affected by oil and gas activity within the Impact Zone?

(5) What is the estimate of how much of the harvestable crop would not be harvested and for how many years expected to be affected by oil and gas activity within the Impact Zone?

(6) The biologist, at his discretion, may include any other information he deems pertinent in determining his evaluation of the oyster lease.

(7) The value of the lease and oysters to be affected by oil and gas activity within the Impact Zone is estimated to be _____ .

_____
Biologist

Approved 2/18/98

FINAL BIOLOGICAL SURVEY
SUMMARY

_____
Board Reference Number
(For Board use only)

1) Provide a detailed description of the change in substrate conditions. Include how many areas of each substrate type were affected and to what degree.

2) Provide a detailed description of any short term changes in salinity.

3) Provide a detailed description of the long term adverse impacts to the substrate, salinity, and/or productivity of the lease.

4) How man sacks of oyster in each size class were damaged or lost?

FINAL BIOLOGICAL SURVEY
SUMMARY

5) For how long did the mineral activity damage occur?

6) What is your final determination of what the net value was of each size class of oysters lost or damaged by this activity?