

# Vocational Rehabilitation Responds to the BP-Horizon Disaster 1: Aquacultural<sup>1</sup> Expert Resources, Necessary Cautions, and Case Examples

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On April 20, 2010, an ultra-deepwater dynamically positioned, semi-submersible offshore oil drilling rig, called Deepwater Horizon (Horizon), exploded in the Gulf of Mexico (Deepwater Horizon Unified Command, 2010a; Transocean, n.d.; United States Department of Energy, 2000), resulting in 11 deaths (Deepwater Horizon Unified Command, 2010b) and the impaired ability to stop an estimated 4.9 million barrels of crude oil from flowing into the Gulf (Deepwater Horizon Unified Command, 2010c). By the end of September, 2010 the disaster has cost BP an estimated \$6.1 billion (BP, 2010) and the United States government has projected billions of dollars in clean-up expenses, indemnity costs, and other miscellaneous claims. In addition to costing 11 lives, the future costs to Louisiana, states along the Gulf Coast, and the United States, remain unknown; including lost wages and vocational opportunities for aquaculture and marine fishery workers. In response, the purposes of the present paper are to discuss resources that may be utilized by vocational consultants to educate the courts and other interested parties about job duties and transferable skills of aquacultural workers, confer necessary cautions when informing the public about these occupations, and then offer three examples of job descriptors, specifically shrimpers, crabbers, and oystermen. It is proposed that the BP-Horizon disaster offers an opportunity to begin the process of understanding previously underexplored occupations along the Gulf Coast.

The BP-Horizon disaster had a significant impact on both authors of this article. Mr. Senette was raised in Leeville, LA (a fishing town on the Louisiana Gulf coast), has participated extensively in the traditional fishing practices of South Louisiana outlined within this article, and is currently a graduate student at the University of Louisiana at Lafayette in Rehabilitation Counseling. Mr. Smith worked for a decade as a rehabilitation consultant for the agriculture industry, completing over 100 farm and aquacultural assessments and also publishing a book on this topic, *Rural Rehabilitation: A Modern Perspective*, and now is on faculty at the University of Louisiana at Lafayette in Psychology and Rehabilitation Counseling. As many national events most often have only distant implications, this event differed, as it had personal significance for both of the authors. For Mr. Senette, his fears aligned with

those of several friends and relatives throughout the region: not only had a single shrimp season been lost, but perhaps the spill may eventually result in the end of not only a commodity, but a culture. He also had an opportunity to discuss the reality that oyster beds in Barataria Bay may be completely dead, and that the implications of such losses would not only affect the fishermen, but also related industries, such as processing plants, aquaculture brokers, and restaurants; with several citizens of South Louisiana. Related to Mr. Smith, he began receiving phone calls, emails, and letters requesting information linked to research he had completed greater than a decade ago on vocational rehabilitation of farm and aquacultural workers.

In response, Mr. Senette and Mr. Smith have collaborated to write two articles addressing the vocational rehabilitation implications of the BP-Horizon spill on

aquacultural workers, not only in Louisiana, but also across the Gulf. The first article offers a review of not only resources and necessary cautions in developing job descriptions for aquacultural workers, but also proffers three case examples. In a second article, specific methods to assess wages for aquacultural workers are reviewed. The goal of which is to prompt discussions related to reliable methods of accomplishing this task. While the well-head (formerly associated with the Horizon rig) has been capped, history suggests that additional oil spills are pending (consider the previous Exxon-Valdez incident and spills associated with Hurricanes Katrina and Rita; Schleifstein, 2010) prompting the need for vocational rehabilitation counselors to evaluate their role, whether plaintiff or defense oriented, in the assessment of employment and wages for workers affected by disasters, whether natural or manmade.

### Background

The aquaculture industry offers not only revenue for the Gulf of Mexico, but it is also of cultural importance. Prior to any discussion of occupational costs, it is important to define both *aquaculture* and *marine fisheries*. Aquaculture is defined as the fostering and growth of aquatic plants or animals for consumption (Aquaculture, 1999), and as such, fish cultures are propagated and harvested. For example, crawfish are deposited in either ponds or rice fields (environments advantageous to their survival and multiplication) and likewise harvested. Similarly, "seed" oysters are planted within environments that have been identified as favorable for the purposes of growth and garner. In contrast, products acquired through marine fisheries are natural to a specific area and are harvested by fishermen from their natural habitats. Such examples of marine fisheries produce are crawfish, shrimp, crab, and finfish. It is important to note that oysters also exist, reproduce, and are harvested from their natural habitat, but have been augmented in the Gulf Coast region for over a century (Dugas, Joyce, & Berrigan, 1997; Louisiana Department of Wildlife and Fisheries, 2009; Pausina, 1970; Pausina, 1988; Vujnovich, 1974; Wicker, 1979; Zacharie, 1897).

Aquaculture and marine fisheries offer a different vocational perspective than many other occupations. First, these industries are primarily seasonal, with oysters harvested from October to April (Louisiana Department of Wildlife and Fisheries, 2009) and shrimp from May to December (Louisiana Department of Wildlife and Fisheries, n.d., a, d). Although crawfish, crabs and finfish are legally available for harvest year round, many sources question the impact of fishing during times of the year that disregard each species' specific life cycle and the consequences on future stocks thereupon (Isaacs & Lavergne, 2010; Loui-

siana Department of Wildlife and Fisheries, n.d., b, c; Greenberg, 2010). Second, these occupations offer a cultural component, specifically; fishing practices function across multiple generations with fathers and sons teaching skills to successive generations; mothers, daughters, and extended family and friends maintaining businesses in the supply chain such as processing plants, wholesale distributors, etc. Third, these industries fluctuate greatly in terms of annual crop yield. Income can be based upon many factors including agricultural and economic, such as: weather; prices associated with produce, fuel or demand, etc.; blight or disease; pollution; political pressures, etc. Fourth, these occupations are performed primarily and ultimately in rural communities (Smith, 1999). Fifth, depending on the long-term effects of the BP-Horizon disaster, these occupations may be significantly undermined, if not permanently eliminated (Associated Press, 2010c).

### Resources for Aquacultural Vocational Information

Although the aquaculture industry offers both revenue and cultural identification in the Gulf, few written resources are available that specifically describe the job duties for these workers. Rather, knowledge has been placed in nontraditional-nonacademic sources (cookbooks), linked to national initiatives with limited outreach outside the agricultural community (AgrAbility), or tied to state agencies, which are often not linked to rehabilitation and legal networks (Extension Service). A discussion of these resources will be presented in the following section.

#### Cookbooks

Across the United States, particularly in the rural South, cookbooks serve a variety of functions, including revenue generation for church and civic organizations, avenues for discussion of local traditions and politics, opportunities for the dissemination of local/regional history, and the personal reflections of the cookbook author and/or organizer. As far as this last point, most often wives of farmers and aquacultural workers assist in the preparation of these cookbooks, lending an opportunity to discuss how their husbands have modified their professional practices. In addition, agricultural specialists have often written cookbooks, allowing not only an opportunity to discuss epicurean fare, but also to offer dialogue about methods of harvesting aquacultural products. For example, Jerald Horst, a fisheries expert previously with Louisiana State University in Baton Rouge, LA (Louisiana Sea Grant & LSU Ag Center, 2006) has written several cookbooks demonstrating this proposition (see *The Louisiana Seafood Bible: Shrimp*, *The Louisiana Seafood Bible: Craw-*

fish, *The Louisiana Seafood Bible: Crabs*, and *Angler's Guide to Fishes of the Gulf of Mexico*).

While cookbooks offer an ecologically valid depiction of the aquaculture industry, many precautions must be exercised. First, these resources were probably written by individuals that have knowledge about the aquacultural industry, but do not have specialized knowledge about either vocational rehabilitation or economics. Second, these dialogues were written to enhance interest in the commercial product, or sell books, and more importantly, not to meet *Daubert* challenges. Third, these resources are snippets of information, not complete references, most often rendering more questions than answers. Considering these weaknesses, cookbooks offer a secondary, albeit cautionary reference for the vocational consultant.

### The AgrAbility Project

As a component of the Farm Bill of 1990, Purdue University, along with the United States Extension Service, obtained grant funding to initiate a program to provide rehabilitation services for farmers with disabilities. Now in its 20<sup>th</sup> year, the AgrAbility program has not only completed literally 1000's of agricultural assessments, has constituent programs in over 20 states and Australia, and expertise in agricultural rehabilitation, but it has also prepared numerous resource manuals to aid in the completion of job analyses and the identification of assistive technology for farmers with disabilities. While the AgrAbility Project has been proactive in fields related to row crops and livestock industries, few resources are available concerning aquaculture products. Other agencies such as the Rural Research Center at the University of Montana, and national organizations such as the National Rural Health Association, National Organization of State Offices of Rural Health, and the Rural Policy Research Institute offer additional resources.

### Extension Service

The Extension Service offers multiple resources for the vocational consultant. The purpose of the Extension Service is the collection, storage, and dissemination of information to assist farmers and farming families in the production of agricultural products. Over the last decade the Extension Service has extended its focus toward home economics for the general population, such as nutrition, finance, and home-safety. While Extension offices typically have a larger public face in rural communities, these offices typically are also available in metropolitan areas. Related to the vocational consultant, the Extension service offers specialists (at both the master's and doctoral level) in both specific agricultural vocations and economics.

As an example, consider a situation where-in a vocational counselor has been requested to render an opin-

ion related to whether a crabber could return to work following a motor vehicle accident. As the crabber himself would offer a biased opinion, and a "supervisor" or "safety manager" would not be available, the consultant may have limited resources to complete a job analysis. In addition to the plaintiff, the vocational consultant may consult with an aquacultural specialist to confirm not only job duties, but also potential use of worksite modifications via use of advancing technologies. If the crabber failed to maintain tax records, an agricultural economist may be consulted to determine product costs and product rates within a specific period of time, assisting the vocational consultant to appraise prospective wages. Additionally, if a life care plan would be needed, an Extension specialist with knowledge of home economics could assist in needed home modifications to accompany a disability. While in the past Extension offices were located in every parish or county, offices now often extend across a region. The services are free to the public, but costs may occur if expert testimony is later required.

## Necessary Cautions

### Cultural Differences

It is predicted that the influx of non-natives will continue to swell the small towns of Southeast Louisiana and other locations along the Gulf Coast for several months after the well is capped. Roles of these non-natives will vary, not only by purpose, but also acceptability, leaving open the opportunity for cultural conflicts. The literature has often discussed "corporate culture" in the context of understanding set patterns of behavior in organizations. Interestingly, similar research has not delved into "rural occupational culture." However, it is important to note that rural sociology has taken up this interest, and many valuable resources are available to understand cultural dimensions of rural South Louisiana. The forensic economist, vocational consultant, or attorney working with aquacultural workers, may want to evaluate and recognize cultural differences between themselves and their clients. Across South Louisiana, many community members still speak Cajun French (which differs somewhat from 'continental' French), leaving open the issue of language barriers. Individuals may also utilize linguistic colloquialisms, leaving professionals with additional linguistic barriers. Therefore, the acceptability of outside professionals may be limited. In summary, professionals should expect cultural issues to affect their ability to access information and provide services.

### Job Analyses

Vocational rehabilitation specialists have multiple opportunities to learn about the world of work, particu-

larly related to job duties performed by a variety of individuals. There are also many resources available to assist the vocational specialist. Once a worksite evaluation is completed, a written job analysis is completed, and then the job analysis is presented to the employer, employee, and physician for review and consideration. Interested parties will then "sign off" on the job analysis regarding their agreement, or disagreement, and the job analysis becomes an important document in the development of a written rehabilitation plan. Related to farming and (particularly) the aquaculture industry, multiple factors will affect both the reliability and validity of the job analysis.

First, the reliability of methods used across aquacultural occupations or among similar workers may be poor. In the traditional workforce, a procedural manual may be completed, or a mentor may be available to teach a specific job task. Quality inspections are then completed to evaluate product features. In contrast within aquacultural farming, great pride is often taken in not complying with set standards. Rather, individuality is stressed. As an example, in the crawfish industry some fishermen may depend on "cut bait" (bait cut by hand), requiring an additional task to be performed by the farmer as a prerequisite to fishing. Still others may depend on molded, meal-based bait that may be commercially produced. Furthermore in crabbing, some fishermen will use a pulley system to drop off and retrieve crab traps from boats, while others will use only *manual* (by hand) methods for retrieving traps. Related to oysters, multiple 'rigged' methods are used to extract oysters from beds beyond the use of simply tongs. Ultimately rendering multiple methods to complete a task; and potentially varying strength, push-pull, reaching, and other components of job duties.

Second, methods to retrieve aquacultural products may vary against expected protocols. Protocols for retrieving product from the ocean are established by multiple agencies, including the Department of Environmental Quality, and the Department of Wildlife and Fisheries (DWF). Anecdotally, farmers may or may not follow these protocols, often in response to several reasons, including independence and economics. For example, in the 1970's the Department of Environmental Quality required shrimpers to modify nets to allow for escape of sea turtles from nets. The modification of net size affected harvest rates and costs. As net spacing was larger in the modified nets, shrimp are undoubtedly lost, ultimately affecting trip costs (i.e., personnel time, fuel, etc.) and harvest rates. In response, shrimpers today may or may not use these modified nets. Similarly, in the Gulf there are few ergonomists on a boat, setting up consistent procedures. Caution should be exercised in depending too heavily on any Cooperative Extension agent, or any other single source of data to pinpoint all job duties,

particularly in this industry. Rather, multiple information sources should be used.

Third, multiple adaptive technologies are available for aquacultural workers. Universities across the Gulf and Eastern seaboard (i.e., Louisiana State University, Texas A & M University, Eastern Carolina University, etc.) have specific departments focused toward the development of technologies designed to improve production capacities for aquacultural workers, enable farmers to be not only more productive, but also to perform tasks with less exertion. Unfortunately, the adoption of technology from these universities to applicable vessels is often poor. Similarly, if the technology is available, farmers may be unwilling to purchase the technology due to the prohibitive price usually associated with early technology adoption, or they may simply be reluctant to modify existing procedures. By gaining knowledge of these adaptive technologies, the rehabilitation consultant may offer recommendations for accommodations, enabling the continuance of work duties following a disability.

### Examination of Individual Industries

Anecdotally, both of the authors were startled at the public interest in not only the oil spill and potential loss of seafood products, but also interest in the *occupations* of harvesting products from the Gulf. News reports often detailed tracking fishermen for a period of time, and then reporting on the experiences. Humorously, some reports were relatively accurate, while others were erroneous. As such, the following sections offer general descriptors of three ecologically valid aquacultural industries: shrimp, crab, and oyster.

#### Shrimp

**Product.** Shrimp are sold at market value by the pound. Two varieties of shrimp account for the majority caught and sold at the Gulf of Mexico: White (*Litopenaeus setiforus*) and Brown (or "Brazilian"; *Farfantepenaeus aztecus*) (Louisiana Sea Grant & LSU AgCenter, 2009; LSU AgCenter, 2009; National Oceanic and Atmospheric Administration, n.d.). Each species of shrimp demands its own price per pound, respectively. In 2008, average price per pound was \$1.70 for White, \$0.91 for "Brown", and \$0.40 for 'all other' shrimp (National Oceanic and Atmospheric Administration, n.d.).

**Season.** In Louisiana, shrimp season is determined by the DWF. In conjunction with biological staff and public comments, the season ranges from early May to as late as January of the following year with its peak coming in May, June, and July (Louisiana Department of Wildlife & Fisheries, n.d., d, e).

**Tools.** Equipment used in the harvest of shrimp varies greatly between fishermen depending on several fac-

tors: size of vessel, size of crew, experience, level of employment (Full-Time or Part-Time), etc. However, there are many common tools that shrimping requires: boats/ships (and all the necessary equipment that they entail such as: engines, fuel tanks, food and water stores, sonar, radar, satellite/GPS, radios, etc.), nets (trawl or butterfly) and tackle (boards/doors/sleds, chains, buckles, floats, Turtle Exclusion Devices (*called* TEDs), ropes, wenches, motors, pumps, etc), ice and refrigeration (chests, holds, freezers, etc.), sorting tools such as: *Trier* boxes (Valdman, Rottet, Ancelet, Guidry, Klingler, LaFleur, Lindner, Picone, & Ryon; 2010), rakes, gloves, dip nets, crates, baskets, boxes, brining tanks (utilizing large quantities of salt), etc.; and additional human resources, specifically laborers.

**Preparation.** Prior to fishing, a shrimper must perform various duties in preparation for the ultimate excursion. The vessel must be fueled and kept in generally good repair, the stores must be purchased and stowed, ice must be purchased and stowed, and all fishing equipment must be inspected and maintained. One of the most regular duties of a shrimping crew is the maintenance of the trawls. This task involves 'knitting' or tying knots at even lengths and in patterns that make up the mesh of the nets using a shuttle or "needle" that is often made by hand from wood, bone, or rigid plastic by one of the crew. Many shrimpers perform these duties themselves during the season. However, some fishermen hire out these services in the off-season.

**Fishing.** The length of a shrimp fishing excursion may last from less than 24 hours to greater than 4 days. An example of a cycle of routine shrimping behaviors are: travel to fishing grounds, deploy nets, "drag" (pulling the nets), "pick-up" or "dump" (haul the nets in, dump catch), clean nets, re-deploy nets (or travel to alternate fishing ground), sort catch, stow catch (in ice chests, freezers, or holds; alternating ice and shrimp in layers), repeat until ice or fuel is empty or holds are full.

**Prepare for Market.** Upon returning from the trip, several duties are required in preparation for arrival into port. The main task to be completed at dock is in transferring the shrimp from the vessel to the dock. Systems utilized to accomplish this task vary according to many factors: size and design of vessel, size of crew, experience, size and design of processing facility (many such facilities have invested in motorized cranes, wenches, and conveyors), total number of laborers available to perform task, etc. The shrimper obtains a receipt from the purchaser itemizing the number of pounds per grade of shrimp. The market value of these "trip tickets" is paid to the shrimper and, likewise, distributed among employees such as deckhands and laborers in pre-ordained portions.

**Physical Demands.** This occupation falls into the Heavy to Very Heavy category. It requires the ability

to lift weights ranging from 0 - 75 pounds or more, frequently. Overhead lifting is required on an occasional to frequent basis. Mid-line lifting is required on a frequent basis. Lower lifting is required on a frequent basis. The following activities are required on a constant basis: reaching, near vision, and balance. The following activities are required on a frequent to occasional basis: walking, standing, fingering, color vision, bending. The following activities are required on an occasional basis: sitting, crouching, far vision, hearing, accommodation, and feeling, kneeling, and stooping. Crawling is required rarely.

## Crab

**Product.** Crab is sold at market value by the dozen in the hard-shell, "peeler", and soft-shell stages of their life-cycle. The Blue crab (*Callinectes sapidus*) is the most popular variety of crab caught and sold in the Gulf of Mexico. Stone crabs (*Menippe mercenaria*) are often caught as well. However, Louisiana law limits the harvest of stone crab to "one whole stone crab per crate" of otherwise Blue crab (Louisiana Department of Wildlife & Fisheries, n.d., b). In 2008, average price per pound was approximately \$0.77 for hard-shell, \$2.61 for peeler, \$6.23 for soft-shell crab, and \$3.13 for "Florida Stone Claws" (National Oceanic and Atmospheric Administration, n.d.).

**Season.** In Louisiana, commercial crab fishing is regulated by the DWF. Crabs may be harvested year round with few exceptions (Louisiana Department of Wildlife & Fisheries, n.d., a) Annual harvests peak twice per year, once between June and July and again around November (National Oceanic and Atmospheric Administration, n.d.). This may be due to the unique characteristics of Louisiana's coastline (Louisiana Sea Grant & LSU AgCenter, 2009; Garret Graves, personal communication, June 9, 2010).

**Tools.** Equipment used in the harvest of crab varies greatly between fishermen depending on several factors: size of vessel, size of crew, experience, level of employment (Full-Time or Part-Time), etc. However, there are many common tools that crabbers require: boats/ships (and all necessary equipment that they entail such as: engines, fuel tanks, food and water stores, sonar, radar, satellite/GPS, radios, life-jackets, emergency flares, first-aid kits, etc.), ice and refrigeration (chests, holds, freezers, etc.), sorting tools such as: tongs, gloves, dip nets, crates, baskets, boxes, etc; and additional human resources, specifically laborers. The most abundant implement stocked by crabbers is the crab trap. Louisiana's commercial crabbers use a design of crab trap called the "Maryland Crab Pot" due to its use in the waters of the Northeast United States. A typical crab trap is made of plastic coated chicken wire, more or less in the shape of a three foot cube, with conical openings on each side which allow mature crabs to crawl in but, not out. The trap also has a

cylindrical container on its bottom side in which bait is placed and secured with a hatch; also made of chicken wire. A loaded trap weighs approximately 10 to 20 lbs. and has a float of some kind tied to it with rope. Bait usually consists of "trash fish" (undesirable fish that have been caught, or purchased from "fish-houses" that would otherwise be discarded; *see* "bi-catch"), although many fishermen use other 'discarded' items such as: turkey necks, chicken carcasses, etc.; in their traps. Crabs are scavengers and will eat almost anything (Poppe, 1977).

**Preparation.** Prior to fishing, a crabber must perform various duties in preparation for the ultimate excursion. The vessel must be fueled and kept in generally good repair, the stores must be purchased and stowed, ice must be purchased and stowed, and all fishing equipment must be inspected and maintained. One of the most regular duties of a crabber is the maintenance of the traps. This task involves 'patching' or replacing sections of the metal mesh using tools such as: wire cutters, needle-nosed pliers, metal clamps, wire, etc. Many fishermen perform these duties themselves during the season or may have multiple sets of traps that may be in any stage of repair throughout the year. However, some fishermen hire out these services in the off-season. Another major preparation for a crabbing trip is in "loading" the traps. It is not unusual for a crabber to own several hundred traps. Many commercial crabbers have 'sets' of traps that they rotate in different areas. For example, a crabber may load bait into as many traps as can fit into his boat, throwing or "setting" the traps out in a circuit (the first trap is close to port; the trap in the middle is near where he turns back toward port; the last trap is near, but not on top of, the first). If it takes this crabber four hours to set his first group of traps, he may choose to "run" three sets per day, equaling a twelve hour day (depending on travel time and time to load the next set of traps) and maximizing his resources.

**Fishing.** It should be noted that crabbers generally work alone or with no more than one partner. This may be due to the necessary use of deck space on their fishing boat. They also, generally, fish during a period of one week before, during, and after a full moon; leaving the fourth week for repairs, and other duties. The popular wisdom is that the conditions of longer light allow the crab to feed nocturnally as well as during the day. Crabbers, like all fishermen, are constrained by the tide and the whims of the weather. Crabs are caught in generally shallow waters (3 to 15 feet). If a crabber does not consider the tide and weather in the placement of his traps, he runs the risk of wasting his efforts. Crabs captured in waters that recede for longer periods of time may die in the sun or be eaten by wild animals such as: otters, raccoons, etc. As well, once the traps have been set, they may be run without the necessity of taking them from the estuary/fishing

ground to port. So, during this three week period the fisherman can run all his traps in less time than it takes to put them out; again, maximizing his resources.

As the fisherman runs his crab traps he may use a long pole or stick with a hook, a mechanical arm with several tines on it, or just reach out and grab the float of a trap. He then pulls the trap in by its rope, opens a seam held in place by a hook and rubber strap, and shakes the trap forcefully, dislodging the crustaceans inside into baskets, crates, or some other receptacle, closes and re-baits the trap, and throws it out again making sure that the bait canister is facing down as it sinks to the bottom; all-the-while steering the boat toward the next trap, watching for other boats, and paying attention to the weather, tide, and supplies (such as fuel and ice).

Crabs must periodically shed their exoskeletons in order to grow. Mature Blue crabs shed every 20 to 50 days. Experienced crabbers can quickly spot crabs about to molt. The resulting soft-shell crabs are considered a delicacy in that they may be eaten whole (shell-and-all). This stage of their life-cycle may be identified by a white line on their rear flippers in "peelers" or "busters" (crabs which are preparing to molt) and in their otherwise soft, leathery carapace. Some fishermen augment their harvest of busters by using "peeler pots" (crab traps in which males are used as bait to attract females that are ready to mate (South Carolina Department of Natural Resources, n.d.). When caught these crabs are deposited in separate containers which Louisiana law demands are labeled as "peeler", "buster", or "soft-shell"; alternatively (Louisiana Department of Wildlife & Fisheries, n.d., b).

**Preparing for Market.** Upon returning from the trip, several duties are required in preparation for arrival into port. The main task to be completed at dock is transferring the crab from the vessel to the dock. Systems utilized to accomplish this task vary according to many factors: size and design of vessel, size of crew, experience, size and design of processing facility (many such facilities have invested in motorized cranes, wenches, and conveyors), total number of laborers available to perform task, etc. Crabbers often offload their catch into a pickup truck or leave it in the boat (if they intend to take their boat home with them). The crabber obtains a receipt from the purchaser itemizing number of pounds per grade of crab. The market value of these "trip tickets" is paid to the crabber and, likewise, distributed among employees such as deckhands and laborers in pre-ordained portions.

**Physical Demands.** This occupation falls into the Heavy category. It requires the ability to lift weights ranging from 0 - 50 pounds or more, frequently. Overhead lifting is required on an occasional to frequent

basis. Mid-line lifting is required on a frequent to constant basis. Lower lifting is required on an occasional to frequent basis. The following activities are required on a constant basis: standing, balancing, reaching, and near vision. The following activities are required on a frequent basis: walking, bending, fingering, and color vision. The following activities are required on an occasional basis: kneeling, stooping, crouching, and feeling. Crawling, accommodation, and sitting are required rarely.

## Oyster

**Product.** Oysters are sold at market value by the sack. A sack of oysters may weigh as much as 100 lbs or more. An individual sack, if “shucked”, may result in approximately 7 ½ lbs of raw oyster meat (LSU AgCenter, 2009). In 2008, average price per pound was \$3.04 (National Oceanic and Atmospheric Administration, n.d.).

**Season.** In Louisiana, oyster season is determined by the DWF which allows harvesting year round. However, it has been stated that you should never eat a “wild” oyster raw in a month that does not have an “r” in its name (Senette, 1982). This may suggest that the temperature of the water and the biological life cycle of an oyster effect the time of year that they are able to be harvested. Notwithstanding, processing technology has developed and utilized a pasteurization process in recent years. This advancement (as well as developments in refrigeration technologies) has led to year round oyster harvest and consumption without the concerns of bye-gone years.

**Tools.** Equipment used in the harvest of oysters varies greatly between fishermen depending on several factors: size of vessel, size of crew, experience, level of employment (Full-Time or Part-Time), etc. However, there are many common tools that oystering requires: boats/ships/“luggers” (and all the necessary equipment that they entail such as: engines, fuel tanks, food and water stores, sonar, radar, satellite/GPS, radios, etc.), ice and refrigeration (chests, holds, freezers, etc.), sorting tools such as: dredges, gloves, oyster tongs, crates, baskets, boxes, sacks, etc.), and additional human resources, specifically laborers.

Oyster tongs resemble two large garden variety Bow rakes hinged just past their heads, tines facing each other and offset in such a way as to allow the tines to interlace. These tongs come in many lengths (dependent on the depth of the oysters being harvested) and are most often homemade.

**Preparation.** Prior to fishing, an oysterman must perform various duties in preparation for the ultimate excursion. The vessel must be fueled and kept in generally good repair, stores must be purchased and stowed, ice must be purchased and stowed, and all fishing equipment must be inspected and maintained.

The most frequent maintenance duties concern the mechanical equipment used to convey and clean the oysters. A dredge is used to scoop oysters from the water bottom. The dredge is a V-shaped iron frame with a long ring-mesh bag that is towed behind the boat and may range in design and relative complexity from a simple hinged arm to a more complex assemblage of rigid arms and hydraulic pumps with electronic controls. A conveyor system (usually consisting of several small diameter metal rollers fixed within a metal, table-like frame) is used to move the oysters along. Additionally, an oyster boat may be equipped with a water pump capable of pressurizing the surrounding waters into a hose and nozzle of the garden variety.

**Fishing.** The length of an oyster fishing excursion rarely lasts longer than a day. In that day, the fisherman routinely: leaves for the fishing grounds (oyster leases) as early as the tide and weather allow, dredge and “clean” the oysters, pack them in ice (in ice chests, freezers, or holds), and repeat until ice or fuel is empty or holds are full.

Although oysters do live in the soft mud of the marshes, waterways, and coastal estuaries of Louisiana (no small portion of which is picked up with the oysters), “cleaning” oysters entails more than hosing them off. Once the dredge has collected oysters in its ‘jaws’ they may be “washed” in the relative current of the moving vessel. Then, they are deposited onto a conveyor/roller belt and rinsed more thoroughly, where clusters of oysters are ‘chipped’/separated into individuals using an oyster hatchet/hammer. This skill takes practice to develop and is required to insure the maximum yield for the fishermen’s efforts. Once separated and washed with water (again) the delicacies are packed in ice or otherwise kept cool, moist, and out of the elements. Calcasieu Parish and Sabine Lake do not allow for dredging but, tonging of oysters only.

**Prepare for Market.** Upon returning from the trip, several duties are required in preparation for arrival into port. The main task to be completed at dock is transferring the oysters from the vessel to the dock. Systems utilized to accomplish this task vary according to many factors: size and design of vessel, size of crew, experience, size and design of processing facility (many such facilities have invested in motorized cranes, wenches, and conveyors), total number of laborers available to perform task, etc. It should be reiterated that a full burlap sack of oysters is extremely heavy. However, harvested oysters are generally kept in loose until they are transferred to the “oyster house” where they will be sorted and sacked, labeled, weighed, and logged. The oysterman obtains a receipt from the purchaser itemizing the number of pounds per grade of oyster. The market value of these “trip tickets” is paid to the fisherman and, likewise, distrib-

uted among employees such as deckhands and laborers in pre-ordained portions.

**Physical Demands.** This occupation falls into the Heavy to Very Heavy category. It requires the ability to lift weights ranging from 0 - 75 pounds or more frequently. Overhead lifting is required on an occasional basis. Mid-line lifting is required on a constant basis. Lower lifting is required on a frequent basis. The following activities are required on a constant basis: standing, balancing, reaching, fingering, and near vision. Walking, bending, and feeling are required on a frequent basis. The following activities are required on an occasional basis: crouching, far vision, color vision, hearing accommodation, kneeling, and stooping. Crawling and sitting are required rarely.

### Discussion and Conclusion

As of today's date (September 1, 2010), the well has been capped, and Deepwater Horizon Unified Command has declared that Gulf seafood is safe to eat (2010d, e). However, other pressing issues are both the quality and quantity of seafood from the Gulf (Dewan, 2010). Admittedly, quantity varies naturally, and determination of harvest rates due to the spill versus natural occurrences will be debated not only in the media, but also the courts. However, it has been determined that "the oysters in Barataria Bay are dead" (Taylor, 2010), rendering the oyster season closed for 2010, and future seasons uncertain for years. One issue pending is public acceptance of seafood from the Gulf (Kirkman, 2010), as scientists still do not understand the long-term effects of oil and dispersants on the exobiology of organisms from this region (Davis, 2010). Signs and menus across the nation are offering alternatives to Gulf seafood until it is determined that the seafood is safe to eat. At present, aquacultural workers are still evaluating their long-term plans regarding vocational placement. It may be predicted that vocational consultants may be assigned to assist these workers with career counseling and placement, similar to job coaches assigned to industries following corporate layoffs. Also, it may be forecasted that aquacultural workers will file claims that they have permanent loss of income if the public does not accept Gulf seafood, even though the FDA has given its approval for sale of seafood products, rendering the need to determine transferability of skills and ultimately employability of these displaced workers. As such, roles that vocational consultants may play are still undetermined. In the interim, the present article has offered information about rural community contacts and resources, necessary cautions in developing return-to-work plans, and case examples, potentially offering both fodder and opportunities for discussion into potential opportunities for rehabilitation consultants.

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### Endnote

<sup>1</sup> Aquaculture and Marine Fisheries represent two distinct vocational fields. The term "Aquaculture" has been used in this article to refer to both of these vocational fields, and similar derivatives (i.e., "Aqua-Culture", "Aqua Culture").

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