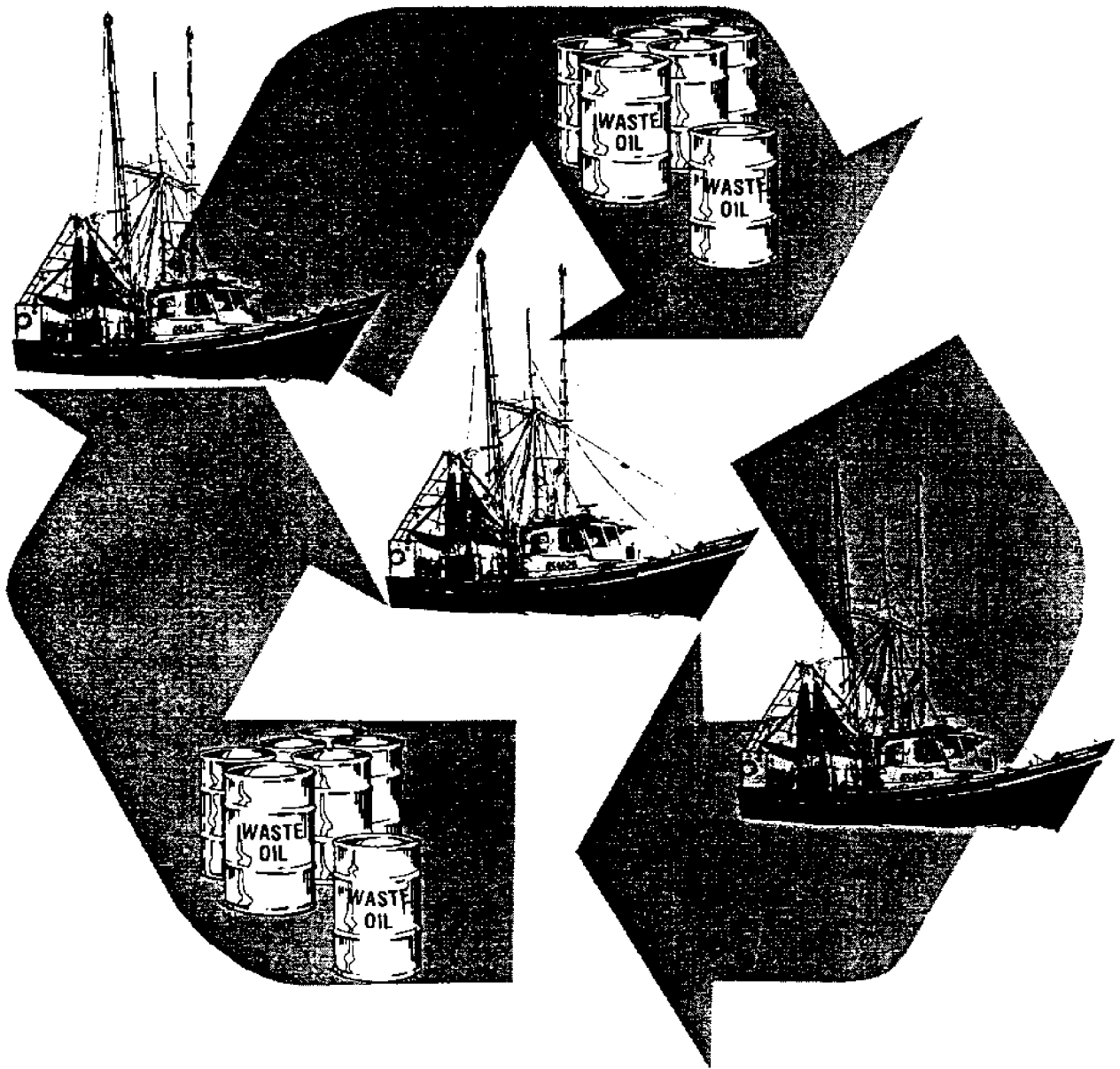


# Potential Impact of Used Oil Recycling in Louisiana's Coastal Fishing Communities

by  
Rodney D. Adams

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Louisiana Sea Grant College Program

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Louisiana Sea Grant College Program  
Louisiana State University

Published by

Louisiana Sea Grant College Program  
Louisiana State University

November 1996

## ACKNOWLEDGMENTS

The author wishes to thank the following individuals who made significant contributions to this study. Kenneth J. Roberts, Sea Grant Marine Resource Economist, Louisiana Cooperative Service, gave the author invaluable guidance in design of the survey, analysis of results, insight into the nature of the licensing protocol, and the configuration and practices of the fleet. Hope Kearney, LSU Coastal Fisheries Institute, reviewed the sample design and provided suggestions that were incorporated. The following individuals provided advice on aspects of the various fisheries that were dealt with in the analysis: Richard Condrey, Walter Keithly, Jeff Rester, and Bruce Thompson of the LSU Coastal Fisheries Institute and John Supan of the Office of Sea Grant Development.

Appreciation is also expressed to the Sea Grant Marine Extension agents in the Louisiana Cooperative Extension Service who assisted in promoting responses to the survey and who provided support in gathering information for this report. Their efforts in developing new recycling facilities have given direction and significance to this study. These include Sandy Corkern, St. Mary and St. Martin parishes; Jerald Horst, St. John, St. Charles and Jefferson parishes; Tom Hymel, Iberia and St. Martin parishes; Dr. Brian LeBlanc, St. Tammany, Orleans, and Tangipahoa parishes; Alan Matherne, Lafourche Parish; John O'Connell, St. Bernard and Orleans parishes; Kevin Savoie, Calcasieu and Cameron parishes; Mark Shirley, Jefferson Davis, Vermilion, and Lafayette parishes; Paul Thibodeaux, Plaquemines and Orleans parishes; and Jerome Zeringue, Terrebonne Parish.

In the Louisiana Department of Wildlife and Fisheries, Corky Perret made unpublished license data available and Joey Shepherd sorted the data and provided it in a format suitable for conducting the survey and analyzing the results. Gerald Adkins, Harry Blanchet, and Ron Dugas provided information relevant to marine fishing practices and helped in the evaluation of the relationship of gear licenses to number of vessels and aspects of multiple license utilization by the fleet.

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This report was prepared under contract #OSR 3119 between Louisiana State University and the Louisiana Applied Oil Spill Research and Development Program, Louisiana Oil Spill Coordinator's Office in the Office of the Governor. The contents of this document do not necessarily reflect the views and policies of the Louisiana Oil Spill Coordinator's Office or that of the Louisiana Applied Oil Spill Research and Development Program. Mention of trade names and commercial products does not constitute endorsement or recommendation for use by the state of Louisiana.

Questions about the data contained in this report should be directed to:  
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Baton Rouge, LA 70803

The report should be cited as follows:  
Adams, Rodney D. 1995. Potential impact of used oil recycling in Louisiana's coastal fishing communities. Louisiana Oil Spill Coordinator's Office, Office of the Governor, Louisiana Oil Spill Research and Development Program, Baton Rouge, LA, 19 pp.

This report is available on CD from the Louisiana Oil Spill Research and Development Program, Technical Report Series, 167-10-4118. The printed report is available from the Louisiana Sea Grant College Program.

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The Louisiana Sea Grant College Program is a part of the National Sea Grant College Program, maintained by NOAA, U.S. Department of Commerce. Louisiana Sea Grant at Louisiana State University is also supported by the state of Louisiana.

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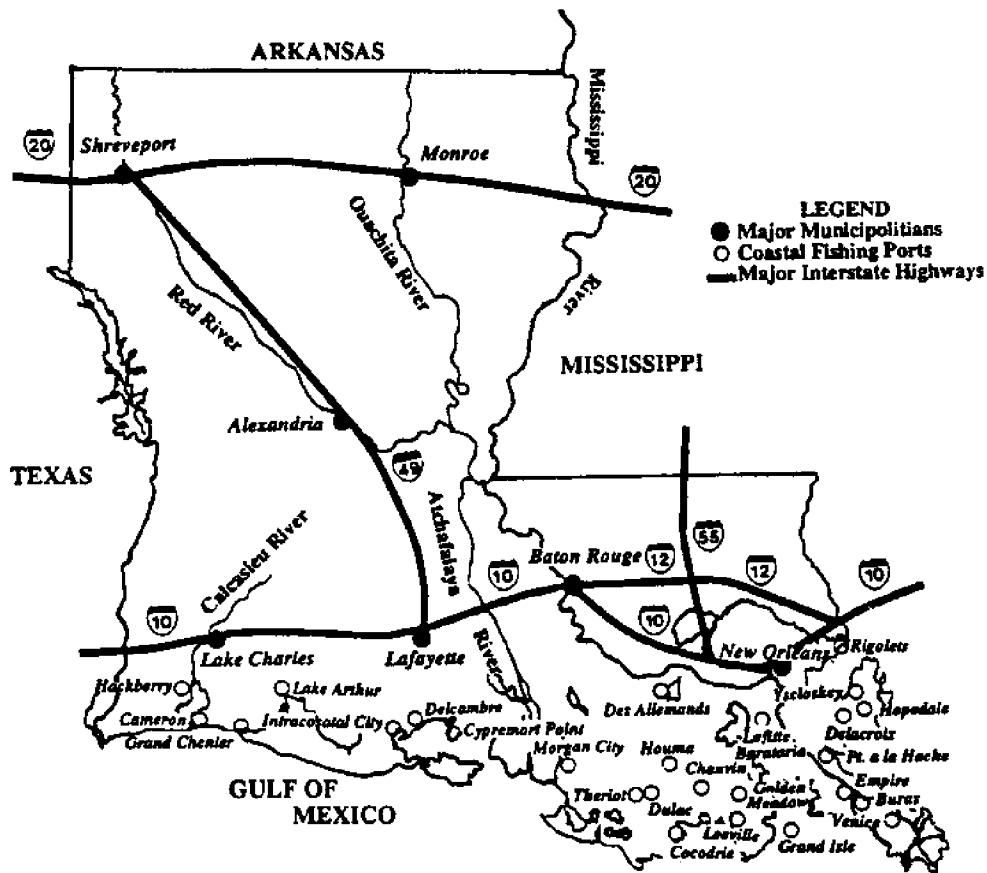
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## LOUISIANA COASTAL FISHING PORTS



# Potential Impact of Used Oil Recycling in Louisiana's Coastal Fishing Communities

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## Abstract

This project investigates the potential impact of used oil disposal by the coastal fishing fleet in Louisiana. Information was collected on the amount of used oil generated annually by coastal fishermen as well as current disposal practices and attitudes toward recycling of waste engine oil. An inventory was conducted of the existing infrastructure for waste oil recycling and collection in coastal Louisiana fishing communities. Similar programs in other states were reviewed for comparison purposes and for incorporation of useful concepts and practices.

Louisiana Department of Wildlife and Fisheries unpublished license data for 1993 were utilized to characterize the configuration of the fleet. The license database for shrimp trawl equipped fishing vessels was sampled to ascertain the volume and frequency of oil change for various classes of vessels. The resulting average volumes and number of changes were combined with vessel numbers interpreted from the license data to produce an annual estimate of the volume and number of disposal events (potential mini spills) associated with this industry.

This study indicates that approximately 250,000 gallons of waste oil are generated by the commercial fishing industry annually, involving more than 50,000 disposal events. Attitudes of respondents to the survey indicated a recycling rate that varied from 50 to 100% on a parish basis. Over 95% indicated a positive attitude toward recycling based on environmental stewardship, 3% felt recycling was important only because of penalties involved, and only 1.5% indicated that recycling was not important. Most respondents preferred recycling facilities located at their fuel or product buyers dock.

A number of public and private recycling centers were identified in the 11 coastal parishes. The fleet configuration in each parish was compared with existing facilities to project where facilities are needed. Several additional public sites are under development at this time.

The states of Washington, Texas and Rhode Island have programs specifically targeting marine oil spills from coastal vessels. The scope of these programs is discussed.

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## 1.0 Introduction

The Louisiana Department of Wildlife and Fisheries (DWLF) vessel license data for 1993 show that over 15,000 vessels are licensed to residents for commercial fishing. This number has been declining steadily since 1987 when there were almost twice as many licensed vessels. An additional 1,451 vessels are presently licensed to non-residents. Many of these vessels are used 200 or more days a year, and many are licensed for more than one type of commercial fishing gear. Roberts and Pawlyk (1986) and Roberts and Sass (1980) make a distinction between boats, which are licensed by the state, and vessels, which are generally larger and licensed by the Coast Guard. The use of the term vessel in this report is broader and includes any boat powered by an engine. Because of this industry's proximity to coastal wetlands and waterbodies as well as the number of vessels actively fishing, commercial fishing has the potential to make a major impact on the coastal ecosystem if the waste oil generated by vessel engines and power plants is disposed of improperly. If oil from each of these engines is changed three times a year on average, this industry has the potential to create 45,000 mini spills, ranging in size from one pint from outboard engine foot grease to 38 gallons from larger diesel-powered vessels.

Several incentives encourage fishermen to recycle waste oil. These include fear of citations and fines for spills, convenience of dockside recycling, and a sense of stewardship for the environment and fisheries habitats. This study's survey examined which of these incentives stimulate fishermen to recycle. Additional incentives to encourage recycling of waste engine oil would have to be mandated by legislation or agency regulations. Two possible incentives might be a mandate for waste oil recycling facilities at fuel docks that sell oil in five gallon containers, and/or a deposit on five gallon oil containers.

There are incentives for the commercial fishing service industry to provide facilities for waste oil recycling. Because fishermen have begun to expect this service, many now leave waste oil in five gallon containers at fuel and seafood docks. Many dock operators consider oil recycling a cost of business, others install recycling tanks to generate goodwill with their customers, and some have a genuine sense of environmental stewardship. An additional incentive for dock operators is that collection of waste oil is often free of charge. Some collectors, who offer free disposal, require that the recycling facility be open to the public. Other collectors take oil at no charge from fuel or seafood dock operators as long as the oil is not contaminated with water or other substances such as antifreeze or diesel fuel.

Disincentives for waste oil recycling for both fishermen and their service industry are also present. Besides fines, the absence of a mandate to recycle and/or an economic incentive to encourage the practice is a negative influence. The attitudes and disposal practices some fishermen have inherited from previous generations are also a deterrent as is the lack of convenient disposal sites in many coastal communities. Liabilities for accidents and disposal of contaminated oil, as well as costs for installation and operation also discourage the proliferation of recycling facilities. A 300 to 400 gallon self-contained recycling system can cost several thousand dollars, and typical costs for disposal of waste oil is \$.24 per gallon. Costs for oil contaminated with water can be twice as high. Potential industrial sponsors have shown interest in donating tank facilities, only to withdraw interest when the concept is reviewed for risk management.

For over two years the Louisiana Cooperative Extension Service (LCES) and the Louisiana Sea Grant College Program have conducted a grassroots campaign to promote waste oil recycling in coastal fishing communities. More questions than answers seem to have emerged

from this effort regarding the issues discussed above. This study, funded by the Louisiana Applied Oil Spill Research and Development Program, has attempted to answer some of these questions. More specifically:

- How much oil is generated by the coastal fishing fleet?
- How many of these fishermen presently recycle waste oil and where do they dispose of it?
- What are the attitudes of these fishermen toward recycling?
- Where are existing public facilities located in coastal fishing communities, and what is the contribution of private facilities?
- What are other states doing in this area of recycling?



## 2.0 Waste Oil Survey Design

Trying to characterize more than 15,000 fishing vessels with resident licenses according to the amount of oil generated would be an insurmountable task. There are 10,136 vessels licensed to harvest shrimp, 2,845 licensed to harvest crabs, 1,059 oyster dredge licenses, and over 4,000 licenses for various types of fish traps and nets. These gear licenses as well as others amount to more than the total number of licensed vessels, because more than one piece of gear can be used on any given vessel, and many vessels fish for different types of seafood seasonally. As a result, a vessel may have several types of gear licenses. A better estimate of oil consumption could be secured by focusing on the shrimp industry which accounts for slightly more than two-thirds of the fishing fleet.

The DWLF furnished 1993 license data and 10,136 names and addresses of vessel owners who also had gear licenses for shrimp trawls. The license data was sorted by parish and boat size. Size classes were: less than 20 feet, 21 to 30 feet, 31 to 50 feet, 51 to 65 feet and larger than 65 feet. Vessels smaller than 21 feet were considered part-time shrimpers, probably with outboard engines, and were not included in the survey. Keithly and Baron-Mounce (1990), Sass and Roberts (1979) and Roberts and Sass (1980) discuss the part-time effort included in commercial license holders. These distinctions are important in economic analyses but were not dealt with beyond the distinction described above. While the 21 to 30 foot class probably contains a significant number of part-time fishermen, this characteristic can be reflected in the fewer number of oil changes related to a smaller fishing effort. Those part-time fishermen were assumed to be proportionally sampled in the random selection process within this size class.

For several reasons the sample design included only the 11 coastal parishes indicated in Table 2.1. These 11 parishes are the target parishes for recycling infrastructure development, and statistics generated at the parish level will be useful to promote this effort. These parishes all have marine extension agents and have the largest numbers of vessels (8,546 out of 10,136). Extension agents in these parishes were available to publicize the survey in newsletters, local media, and public meetings. Therefore, these parishes had the greatest potential for a significant response at the parish level. We hoped to receive at least five responses for each size class in each parish. Optimistically assuming a 50% response required 10 samples per size class in each parish or all license holders if there were 10 or less. If there were less than 10, the deficiency was made up by increasing the number in another parish for that size class. Samples for questionnaire distribution were drawn on the basis of 10% of the total in each parish/size class with a minimum sample of 10 or the total in each class if less than 10 (Table 2.1). The survey form is in the Appendix.

Survey forms were mailed to a list of randomly drawn names sampled by parish and size class from the list of 1993 license holders who had vessel and shrimp trawl licenses. The LCES fisheries agent for each parish sent a letter requesting the cooperation of selected vessel license holders along with the survey form. A postpaid return envelope was included to encourage return of the completed survey. A follow-up postcard mailing was sent to the original mailing list, thanking respondents for their response if they had completed the survey and encouraging participation if they had not responded. A collect call was authorized for those who no longer had the survey form so they could request a new form or answer the survey over the phone. The two mailings resulted in a response rate of 21%.

**Table 2.1** Number of licenses(L) and sample size(n) by parish and vessel length

<b>PARISH</b>	<b>21-30 FEET</b>	<b>31-50 FEET</b>	<b>51-65 FEET</b>	<b>&gt; 65 FEET</b>	<b>1-20 FEET</b>
	<b>L n</b>	<b>L n</b>	<b>L n</b>	<b>L n</b>	<b>L n</b>
<b>Cameron</b>	47 10	56 10	25 10	7 7	101 *
<b>Vermilion</b>	84 10	51 10	30 10	37 10	121 *
<b>Iberia</b>	119 10	14 10	6 6	4 4	166 *
<b>St Mary</b>	96 10	65 10	16 10	10 10	188 *
<b>Terrebonne</b>	470 47	391 39	161 25	47 20	788 *
<b>Lafourche</b>	313 31	273 27	79 10	47 20	702 *
<b>Jefferson</b>	580 58	321 32	86 10	66 20	636 *
<b>Plaquemin.</b>	337 34	227 23	27 10	6 6	322 *
<b>St Bernard</b>	248 25	143 14	13 10	2 2	338 *
<b>Orleans</b>	108 11	70 10	23 10	20 10	138 *
<b>St Tammany</b>	143 14	60 10	3 3	1 1	114 *
<b>Others</b>	517 0	138 0	26 0	28 0	878 0
<b>Total</b>	3,062 262	1,809 195	495 114	275 110	4,492 0

\* Excluded from survey, typically outboard engine.

### 3.0 Waste Oil Survey Results

The volume of oil generated by a given vessel is dependent on several factors including total engine hours (hours fished), personal habits of operator, and type of engine. The volume of oil generated within a size class varied in the 21 to 30 foot size class from 1.5 gallons per oil change for gasoline engines (which only had the oil changed once or twice a year) to 30 gallons per change with two to 12 oil changes per year. The average volume generated was 14.56 gallons per year, and the average number of oil changes was 3.53. The volume generated by the 31 to 50 foot size class generated as many as 10 gallons per change with as many as 14 oil changes per year for some vessels. The average annual volume generated by this size class was 30.47 gallons and the average number of changes per year was 5.07. The 51 to 65 foot class averaged 53.75 gallons per year with 4.92 oil changes. Individual vessels generated up to 21 gallons per change and as many as 20 changes per year. The greater than 65 foot class averaged 136.19 gallons per year of waste oil, with individual vessels generating up to 38 gallons involving as many as 20 oil changes per year.

Since response rates for individual size classes in each parish varied considerably, the totals for a parish/size class unit were based on the average annual volume and number of changes for that size class across all parishes, multiplied by the number of vessels licensed for that size class in each parish. The size class average annual volume and number of changes from the survey data were also applied to license holders who resided in other parishes not directly on the coast. These operators generally dock their vessels in one of the coastal parishes or refuel and sell their catch in a coastal parish. The data for these vessels is listed in Tables 2.1 and 3.1 under "Others."

Table 3.1 shows the results of the survey data analysis. A problem arose in tabulating the 21 to 30 foot size class. Several respondents indicated that their vessels were powered by outboard engines. As a result, they should have been grouped with the smaller size vessels for analysis of waste oil volume generated.

**Table 3.1** Annual volume of waste oil generated in gallons (V) and frequency of oil change (F), by parish and size class of vessel

PARISH	21 TO 30 Ft.		31 TO 50 Ft.		51 TO 65 Ft.		> 65 Ft.	
	V	F	V	F	V	F	V	F
<b>Cameron</b>	684	166	1,706	284	1,344	123	953	58
<b>Vermilion</b>	1,223	297	1,554	259	1,613	148	5,039	309
<b>Iberia</b>	1,150	279	427	71	323	30	545	33
<b>St Mary</b>	1,378	339	1,981	330	860	79	1,362	84
<b>Terrebonne</b>	5,868	1,423	11,913	1,982	8,653	792	6,401	392
<b>Lafourche</b>	3,261	791	8,318	1,384	4,246	389	6,401	392
<b>Jefferson</b>	5,809	1,408	9,781	1,627	4,623	423	8,989	551
<b>Plaquemines</b>	2,941	713	6,917	1,151	1,451	133	817	50
<b>St Bernard</b>	3,611	875	4,357	725	699	64	272	17
<b>Orleans</b>	0	0	2,133	355	1,236	113	2,724	167
<b>St Tammany</b>	1,383	335	1,828	304	161	15	136	8
<b>Others</b>	7,528	1,825	4,204	700	1,397	128	3,813	234
<b>Total</b>	34,856	8,451	55,119	9,172	26,606	2,437	37,452	2,295

The data were analyzed in two ways to account for this discrepancy. In one analysis, the outboards were tabulated with the inboards and reported as generating a gallon or less per year from lower unit changes; the number of vessel licenses in that size class was not adjusted. In the second analysis, the population of vessels in the 21 to 30 foot size class was adjusted based on the ratio of outboard respondents to inboard respondents for a given parish, and the deleted vessels were tabulated with those in the less than 20 foot size class. The results were not appreciably different, varying by less than 3%. In the former case, we assume that the ratio of outboards to inboards in that parish is  $o/N$ , where "o" is the number of outboard vessel licensees responding to the survey and "N" is the number of vessels licensed in the parish. The latter method would assume that the ratio of outboards to inboards in a given parish is  $o/n$  where "n" is the number of survey respondents in that parish who indicated that their vessels were powered by inboard engines. The latter assumption is more reasonable, and the number of licensed vessels in this size class was reduced for each parish by this ratio before multiplying by the average

volume and frequency of oil change to achieve the results shown in Table 3.1.

The case of Orleans Parish is a unique example of the two approaches considered in this decision. Only one response was recorded in the 21 to 30 foot size class, and this response indicated an outboard powered vessel. Therefore, in the selected logic, all of the vessels in this size class were assumed to be outboards and the 108 licensed vessels shown in Table 2.1 were moved to the less than 21 foot size class for analysis of volume and frequency of oil change per year. The alternative approach would indicate that only one of the 108 vessels in this parish/size class was outboard powered. Both assumptions are probably incorrect, but they are the only two choices that can be reached from the available data.

The data for Jefferson Parish are more straightforward; five out of 16 respondents reported outboard powered vessels. The selected logic would assume that 181 of the 580 licensed vessels were outboard powered while the rejected logic would indicate that only five of the 580 licensed vessels were outboard powered. In all, 487 licensed vessels were moved from the 21 to 30 foot size class to the less than 21 foot class in this analysis.

This survey estimates the total volume of waste oil generated by vessels larger than 20 feet in length that were licensed for shrimp trawls in 1993 to be 154,033 gallons. This involves 22,355 individual oil change episodes ranging in volume from 1.5 gallons for gasoline engines to 38 gallons for vessels powered by larger twin diesels. The fleet of boats less than 21 feet in length is predominately powered by outboards but represents an additional 5,160 fishing craft with single or dual engines. If each only changed the lower unit lubricant twice a year, this could generate an estimated 10,320 disposal events, each consisting of 0.25 gallons of lower unit oil (OMC, 1995). Total disposal events or potential mini spills would be increased to 32,675. This would add an additional 2,580 gallons as a minimal estimate to the amount of waste oil generated by this industry, for a total of 156,613 gallons.

An additional contribution from the vessels equipped with butterfly and skimmer nets, which were not included in the analysis, should easily push the shrimp fishery total above 200,000 gallons per year and increase the number of disposal events to over 40,000. Other fishing licensees such as crabbers, oyster dredgers, gill netters, and the menhaden fleet also contribute to the generation of waste oil by the coastal fishing fleet. Since many vessels hold licenses for more than one type of fishing gear, it is not within the scope of this project to quantify this contribution. However some estimates can be made for some of these license categories on the basis of typical vessel configuration and fishing practice. A summary of these estimates is shown in Table 3.2.

**Table 3.2** Summary of waste oil generation by gear license category

<b>License Type</b>	<b>Number of Vessels</b>	<b>Gallons per Year</b>	<b>Changes per Year</b>
Shrimp Trawls	4,973	154,033	22,355
Shrimp Trawls O/B	5,160	2,580	10,320
<b>Shrimp Trawl Tot.</b>	<b>10,133</b>	<b>156,613</b>	<b>32,675</b>
Butterfly	1,905	13,868	3,372
Skimmer	2,292	33,372	8,091
<b>Shrimp Fleet Tot.</b>	<b>14,330</b>	<b>204,123</b>	<b>44,138</b>
Crab Trap	2,836	8,508	5,672
Gill Net	900	450	1,800
Oyster Dredge o/b Lugger	386 773	193 23,190	772 3,865
Menhaden	53	23,850	318
<b>TOTAL</b>	<b>19,225</b>	<b>236,464</b>	<b>56,247</b>

Prior to 1992, all skimmer nets were licensed as butterfly nets. In 1992 a separate license was made available for skimmer nets. Since then, the number of each type of license has been roughly equal, each representing roughly one half of the pre-1992 license total (DWLF, unpublished data). Butterfly nets are fished passively with tidal currents, bringing shrimp emigrating to offshore habitats to the nets at or near the surface of the water column. Since these currents and movements are periodic and occur during peak spring tides at the new and full moon phase, the fishing effort is limited to periodic events during a specific seasonal migration. The nets can be attached to a fixed structure, fished in pairs from an anchored boat, barge, or vessel moving into the current with engine power. Some fishermen use trawls when the tidal currents do not favor emigration and fish butterfly nets several days a month when the mature shrimp are moving out of the estuaries (Paul Thibodeaux, personal communication). Because all of these variables make data for this sector of the fleet difficult to quantify, a factor equal to one half the volume and frequency of the 21 to 30 foot size class was chosen as a multiplier for this sector of the fishing fleet. The 1993 license data identified 3,809 resident butterfly nets issued on a per net basis. Since most vessels fish two butterfly nets, it was assumed that this represented 1,905

vessels. The resulting volume and frequency of oil change attributable to this type of gear are estimated to be 13,868 gallons and 3,372 oil change events per year.

Skimmer nets, similar in configuration and deployment to butterfly nets, are used under power in shallow bays and lakes. Because the nets encompass the whole water column and are in contact with the bay or lake bottom, a vessel with considerable power is needed to push this device. Most vessels are converted Lafitte skiffs, 25 to 40 feet in length with inboard engines (op. cit.). As a conservative estimate, the volume and frequency of oil change for the 21 to 30 foot size class was chosen as a multiplier for this gear type. The 1993 license data listed 4,853 skimmer net licenses issued on a per net basis, which would indicate a fleet of 1,905 skimmer net vessels. The resulting volume and frequency of change for skimmer nets would be 33,372 gallons and 8,091 changes per year. These figures, when combined with the trawl data and the butterfly net estimates, provide a total volume of waste oil generated by the shrimp industry of 204,273 gallons per year with 46,118 disposal events.

Since the number of vessels added by this assessment brings the total for the shrimp fleet to 14,330 vessels, and the total number of vessel licenses is 15,879, it is obvious that some of these vessels have been counted twice due to possession of multiple gear licenses. However, considering that conservative multipliers were used and that the secondary license generated more fishing effort and resulted in more frequent oil changes, we believe the volume and change efforts to be reasonable.

Crabbers typically operate in smaller boats powered by modest horsepower inboard or outboard engines. Gear licenses for crab traps are issued to each fisherman, so the 2,836 crab trap licenses should represent the same number of vessels (Gerald Adkins, personal communication). These boats were assumed to generate waste oil in the same proportions as the shrimp vessels in the less than 20 foot class and the 21 to 30 foot class. If we assume that gasoline engine inboard-powered boats generate 1.5 gallons per oil change and two changes per year, these boats would generate only three gallons of waste oil per year per vessel. If this volume is assumed to be typical of crabbers, their annual contribution would be 8,508 gallons of waste oil and 5,672 disposal events. It is assumed that those boats powered by outboards generating 0.25 gallons on lower unit oil per change would be offset by a few small diesels that generate three to five gallons per change. Multiple licenses undoubtedly come into play here also, and the effort may include part-time operators. However, since the licenses represent an actual fishing effort, we believe the estimate is reasonable.

Saltwater gillnet fishermen typically operate in smaller boats 20 to 22 feet in length powered by outboard engines in the 150 horsepower range. These boats generate waste oil in the same proportions as the outboard powered shrimp vessels: 0.5 gallons per year, consisting of two disposal events. Since saltwater gillnet licenses for 1993 were issued for any number of nets, the 900 licenses in this category represent 900 boats (Harry Blanchet, personal communication). Using these assumptions, the total volume generated by this segment of the fishing fleet is 450 gallons, with 1800 disposal events produced. Many of these fishermen are multiple license holders and probably less than 10% fish full time. Since this is only an estimate and the volumes involved are quite low, no effort was made to reduce the ratings to account for these factors.

Oyster dredgers generally operate two types of boats, the typical lugger which deploys two dredges and is 31 to 65 feet in length, and smaller outboard-powered single dredge flat boats that are used to check leases and fish in shallow water. The number of flat boats is estimated to be roughly one-third of the fleet (Ron Dugas, personal communication). Assuming two dredges per lugger, one dredge per flatboat, and the two to one ratio, the 1,159 dredge licenses would be spread over 773 luggers and 386 outboard powered flat boats. Using the survey data for shrimp

trawl vessels 20 feet or less in length, the contribution of the outboard powered dredge boats would be 193 gallons per year and 772 oil change events. Shrimp trawlers in the size classes comparable to oyster luggers generated approximately 30 to 50 gallons per vessel per year with five changes per year for both size classes. If we take the more conservative estimate of 30 gallons per year as typical of an oyster lugger fisherman's annual oil use, the annual contribution of this industry is estimated to be 23,190 gallons per year and 3,685 oil change events per year.

DWLF license data shows the menhaden fishery as licensed for 53 purse/menhaden seines on a per seine basis. This translates into 53 "mother boats," 160 to 200 feet in length, each having two "set boats" that are 40 feet in length. These boats are active for six months per year fishing for up to five days per trip. Mother boats have two 800- to 900-horsepower engines associated with propulsion and five 100- to 175-horsepower engines for fish pumps, refrigeration, hydraulics, power generation, etc. Each 40 foot set boat has its own 200-horsepower diesel engine. The menhaden industry has a rigorous system of waste oil and filter disposal (Steve Benton, personal communication).

Estimates of oil generated by a typical mother boat were collected from interviews with vessel engineers in a cross section of the menhaden fleet. These estimates varied with the type of main propulsion engine used. Oil capacities for each of these larger engines ranged from 19 gallons to 55 gallons. The smaller process and set boat engines were consistently reported with capacities of five gallons per engine. The frequency of oil changes on the surveyed boats varied from three to eight per year, varying with engine size and use. Process and propulsion engines on the same mother boat have different capacities and may also have different oil change schedules (Jeff Restor, personal communication). The amount of waste oil generated by the menhaden fleet was estimated by using an average figure of 40 gallons per engine and three changes per year for main propulsion engines and five gallons per engine and six changes per year for the process and set boat engines. This assumption resulted in an estimated volume of 23,850 gallons of waste oil generated on an annual basis with 318 associated change events.

Based on the estimates shown in Table 3.2 for the various gear license categories, the volume of oil generated by the coastal fishing fleet was calculated to be 260,314 gallons per year with 56,565 associated oil change events. By this same analysis, the number of vessels operating was estimated at 19,278. This figure, 25% more than the 15,382 vessel licenses actually issued in 1993, may be attributed to instances where some vessel owners hold more than one type of gear license. Since it was not possible to sort out this duplication, a correction factor was applied to the data shown in Table 3.2. Vessels licensed for shrimp trawls were estimated to generate 156,613 gallons of waste oil per year based on the survey data. The estimates for this category were not altered. An additional 103,701 gallons per year were generated by the various other gear license categories shown in Table 3.2. This additional volume was reduced by 25% to account for gear license duplication, yielding a corrected volume from other gear licenses of 77,776 gallons per year. The adjusted estimate for the coastal fishing fleet is 234,389 gallons of waste oil per year. The 23,890 additional oil change events per year associated with other gear licenses were also reduced by 25% to give a corrected estimate of 50,593 change events or potential mini spills per year for the coastal fishing fleet.

In addition to questions aimed at the amount of oil generated by each vessel, several questions were included to gain insight into recycling practices and attitudes of vessel operators. The first two questions dealt with disposal procedure for waste oil, including size of container used, method of disposal, and location of recycling station. Respondents were not asked to indicate that they did not recycle, but the "other disposal procedure" alternative gave those who did not recycle a category for response without self incrimination. The last two questions dealt



with the respondent's preference for location of recycling facilities and attitude toward recycling.

Most vessel operators recycle used engine oil in the five gallon buckets used for buying replacement oil. The survey indicated that 73% of the respondents used this type of container. Personal contacts with fishermen and dock operators indicated that the ability to handle this size of container when full and the common availability of the container lead to this preference. Some operators of larger vessels reported using larger than five gallon containers, though this only represented 7% of the total respondents. Many of these vessels have access to dockside pumping stations, and the large volumes (up to 38 gallons in twin engine vessels) generated with each oil change make smaller containers less practical for storage. Operators of smaller vessels, especially those with gasoline powered engines having a 1.5 gallon oil capacity, reported using smaller than five gallon containers. These operators comprised 19% of the total respondents.

Examination of the survey data indicates that used oil is being recycled by 82% of the vessel owners responding to the survey, when summed over all vessel size classes and parishes. Examining the data by parish showed that recycling is quite strong in St. Mary, Plaquemines and St. Tammany parishes (each reported 100% recycling rates), and in Jefferson Parish (92%). In Vermillion Parish, 83% of the operators are recycling waste oil; in Lafourche Parish, 81%; in Orleans and Iberia Parishes, 75%; in St. Bernard Parish, 71%; in Terrebonne Parish, 65%; and in Cameron Parish, 50%.

Most of the respondents (95.5%) indicated a positive attitude toward recycling. Only 1.5% of the total respondents indicated that recycling was not important, while 3% indicated that recycling was necessary only because of the penalties for improper disposal. The results also indicated that an impressive number of respondents recycle waste engine oil. In all parishes surveyed, 21 to 30 foot vessel operators reported an 80% rate of recycling, 31 to 50 foot operators reported a 79% rate, 51 to 65 foot operators reported an 82% rate and operators of vessels over 65 feet reported a 92% rate. The overwhelmingly positive attitude and high percentage of respondents who presently recycle their used oil, as indicated by the survey results, seem to indicate that this industry places a high value both on recycling and on the habitat that supports their target species. This might, however, indicate only that response to the survey was greater among the vessel operators who are most concerned with stewardship for the environment.

The preferences for location of recycling facilities are shown in Table 3.3. Preferences for locations at fuel docks were predominant, with preference for locations at seafood buyers' docks generally second in popularity. Those in the smallest class favored a public dock as a second preference. These results are based in part on practicality and in part on present disposal practices. Larger boats, which generally have larger volumes to dispose of, prefer dockside locations. Operators with smaller volumes for disposal indicated current practices of disposal in land based facilities such as service stations or rapid lube facilities, and a corresponding preference for land-based disposal options.

**Table 3.3** Recycling preferences

<b>SIZE CLASS</b>	<b>Fuel Dock</b>	<b>Buyer's Dock</b>	<b>Public Dock</b>	<b>Land Based</b>
21 TO 30 Ft.	47%	9%	35%	9%
31 TO 50 Ft.	44%	27%	12%	17%
51 TO 65 Ft.	61%	21%	14%	4%
> 65 Ft.	66%	28%	3%	3%

## 4.0 Coastal Parish Needs for Oil Recycling Facilities

The infrastructure for oil recycling in 11 coastal parishes was surveyed by several methods. Marine Extension Agents provided initial identification of sites in each of their areas of responsibility. Subsequent visits to coastal communities provided additional information. The survey described earlier in this report not only assessed volumes of waste oil generated and attitudes toward recycling, it also helped identify where waste oil is recycled. Information on companies that pick up waste oil for recycling was gained from telephone book surveys and personal contacts with fuel dock operators and seafood buyers. Information on products manufactured for the support of oil recycling was explored as part of the infrastructure. This information is listed in the appendix.

Three methods are commonly used by coastal fishermen to recycle waste oil. Many fishermen leave waste oil at seafood buyers' docks, fuel docks, and ice docks. These merchants have a variety of mechanisms for storing and disposing of oil, ranging from storage in 55 gallon drums to state of the art recycling containers. The latter range from 400 to 10,000 gallon capacities. Some have dockside facilities capable of removing oil directly from vessels. Some merchants pay to have the waste oil picked up for recycling while others do not pay unless the oil is contaminated. Some fishermen carry the oil in five gallon containers to land-based recycling facilities (such as rapid lube automotive facilities or full service gas station facilities). Several fishermen have access to industrial-based facilities where they were employed. The other main disposal mechanism is dockside public recycling facilities, which generally have tanks ranging from 500 to 2,000 gallon capacities. These facilities normally have a funnel shaped fill port with a screen at the base where filters can be drained. No facilities with filter crushers were found in the survey. Generally these facilities are serviced at no cost by the recycling hauler as an incentive to promote public recycling facilities.

The following facilities were identified for the 11 coastal parishes listed in Table 2.1. These 11 parishes were identified as having significant coastal fishing fleets from 1993 DWLF license data. A summary of facilities accessible to the general public is listed in the appendix.

- **St Tammany Parish (207 shrimp vessels over 20 feet in length)**  
No public access facilities were identified for this parish, but most of the recreational/commercial marinas on the north shore of Lake Pontchartrain have oil recycling facilities or are planning installations in the near future (Brian LeBlanc, personal communication). As can be seen from Table 2.1, most of the vessels in this parish are in the smaller size classes, and many are probably trailered or moored at recreational marinas. Several respondents indicated that their vessels are operated from ports in other parishes closer to the fishing grounds in the Gulf of Mexico or coastal bays and lakes. With the addition of oil recycling facilities in recreational marinas, no additional sites are needed in this parish.
- **Orleans Parish (221 shrimp vessels over 20 feet in length)**  
No public access facilities were identified for this parish, but most of the recreational marinas on the south shore of Lake Pontchartrain are planning installations in the near future (op. cit.). As can be seen from Table 2.1, most of the vessels in this parish are also in the smaller size classes and are probably trailered or moored at recreational marinas. Several respondents indicated that their vessels are moored in other parishes closer to

fishing grounds. An additional site is needed on the eastern side of the parish near the Rigolets, a tidal pass connecting Lake Pontchartrain with Lakes Catherine and Borgne and the Mississippi Sound.

- **St Bernard Parish (406 shrimp vessels over 20 feet in length)**  
This parish presently has no public oil recycling facilities but has several commercial fishing ports with direct access to the Mississippi River Gulf Outlet (Hopedale and Yscloskey) and Breton Sound (Delacroix). Public docking facilities owned by the parish at these locations are being encouraged to install recycling tanks by the LCES/Sea Grant initiative along with several marinas, fuel docks, and seafood buyers. Proximity to the Greater New Orleans Metropolitan Complex affords some land-based recycling alternatives that target automotive oil recycling, but at least one site is needed at Hopedale or Yscloskey, and one is needed at Delacroix.
- **Plaquemines Parish (597 shrimp vessels over 20 feet in length)**  
This parish has the most complete oil recycling infrastructure. The parish maintains a series of boatyards at each of the major ports where fishing vessels are berthed. At Venice, Buras, Empire, and Pointe a la Hache, 500 gallon tanks are located. The tanks are square in design with an internal screen for draining oil filters. Only one additional site at Port Sulphur may be needed in this parish. However, there is no parish boatyard at this site, and there are fewer vessels here than at other locations closer to the coast.
- **Jefferson Parish (1053 shrimp vessels over 20 feet in length)**  
There are a number of public and private recycling facilities in Jefferson Parish. The major fishing ports include Lafitte and Grand Isle. A public facility was established in Lafitte with the cooperation of International Petroleum Corporation. This site is presently located at C&N Bayou Fuel, located below the town of Lafitte near the south end of Bayou Barataria. An additional site is needed further up the bayou in Lafitte. A major shrimp dock operates a recycling facility in Grand Isle for vessels selling their catch at this dock. Several fuel docks and a major marina also have recycling facilities. Several other shrimp buyers in Grand Isle are considering operating as public recycling facilities. The addition of one or more of these shrimp docks should satisfy the recycling needs of this area for the immediate future.
- **Lafourche Parish (712 shrimp vessels over 20 feet in length)**  
The major fishing ports in Lafourche Parish include Port Fourchon, Leeville, and Golden Meadow. Port Fourchon has no public recycling facilities, but a major fuel dock accepts oil from both fishermen and the offshore oil service fleet doing business with the fuel dock. Leeville has two recently established public facilities at Griffin Marine and Leeville Fuel and Ice. The tanks and associated platforms were fabricated and donated by AMOCO and are serviced by Specialty Environmental Services at no cost. There are two private facilities at Golden Meadow, at a shrimp buyer's dock and at a major fuel dock. No additional sites are needed in this parish at present.
- **Terrebonne Parish (1069 shrimp vessels over 20 feet in length)**  
Although it is the coastal parish with the largest fleet, Terrebonne has no public recycling facilities. The major ports include Houma, Pointe au Chien, Cocodrie, Dulac, and Bayou

du Large. Houma was not surveyed, as it is a major metropolitan area with an extensive marine service infrastructure. Dulac has one public site pending and several seafood buyers and fuel docks that recycle oil for their customers only. At least one site each is needed at Pointe au Chien, Cocodrie, and Bayou du Large.

- **St Mary Parish (187 shrimp vessels over 20 feet in length)**  
The major fishing port is Morgan City with smaller fleets in Franklin, Baldwin, Patterson, Calumet, Berwick, Cypremort Point, and Amelia. No public facilities have been identified, but several fuel docks and marinas take oil from their customers. Public facilities are needed at Morgan City and several of the minor ports.
- **Iberia Parish (143 shrimp vessels over 20 feet in length)**  
The chief fishing port is Delcambre. This port is split by the Iberia/Vermillion Parish line but for reporting purposes is listed in Iberia Parish. There was previously a public disposal site at the City Barn, close to the dock facilities but not dockside. This facility apparently was never used to any great extent by fishermen and seems to have been abandoned. A new public facility is being sought, but arrangements are not finalized at this time.
- **Vermilion Parish (202 shrimp vessels over 20 feet in length)**  
The chief fishing port is Intracoastal City, which has facilities at several fuel docks, but a public facility is desired by the fishermen at the shrimp dock.
- **Cameron Parish (135 shrimp vessels over 20 feet in length)**  
The major fishing ports are Cameron, Grand Chenier, and Hackberry. Lake Arthur is just north in Jefferson Davis Parish above Grand Lake. The Southwest Louisiana Fishermen's Association sponsored a public facility on Shrimpers' Canal at Iowa Street to service the local fleet, which numbers 15 vessels over 20 feet. There are no public facilities in Cameron Parish, but a number of fuel docks take waste oil from their customers only. A public facility at Grand Chenier is being considered, but is not operational at this time. Hackberry has been identified as a site where facilities are needed.

A number of companies reclaiming waste oil and marketing equipment useful in recycling of waste oil have been identified during this project. These vendors are listed in the appendix. This is not an exhaustive list, but was developed as vendors and product lines were identified.

## 5.0 Marine Recycling Programs in Other States

The state of Washington has a very active program in marine oil spill prevention. The Washington Sea Grant Program's Marine Oil Spill Prevention Education Program is designed to reduce the number of small spills that occur in coastal waters. The state legislature provided funds to establish the Marine Oil Spill Prevention Education Program in 1991. This program targets small spills caused by commercial vessel operations, port and marina activities, marine related industries and other sources. The program builds on Washington Sea Grant's history of cooperative interaction with the marine industry and federal and state agencies, and the extensive resources of the University of Washington and other Sea Grant College Programs. Initial activities include:

- Establishment of a used oil filter pilot program at Everett Marina. This model facility has spawned similar programs at other ports, most notably at Fishermen's Terminal in Seattle.
- Completion of a statistical analysis of small oil spills that describes real-life pollution scenarios, discusses causes, and recommends preventive measures.
- Lesson plan development on small spill prevention for incorporation into vocational marine training programs.
- Formation of the Pacific Oil Spill Prevention Education Team with participants from Oregon and California. Joint action created the "1-800" response number to expedite oil spill response efforts and vessel operator participation.
- Establishment of an exhibit at the Seattle Aquarium to ensure a technically correct and persuasive oil spill prevention exhibit.
- Publication of education and awareness materials including fact sheets, pocket navigation aids with a stop oil spills message, maintenance and repair spill prevention brochures, Marine Yellow Pages insert, and oil spill prevention signs.

Texas is active in small spill prevention. In 1991, the legislature designated the Texas General Land Office as the lead state agency for oil spill prevention and response in coastal waters. This office educates the marine community about oil spill prevention and recycling. Several videos are being produced to aid in public education and awareness. Brochures have been produced describing prevention techniques and advertising toll free numbers for spill reporting and information on used oil collection centers. A pilot program is being developed to install oil/water separators at selected fishing ports and coastal marinas. If the pilot program proves successful, a coast-wide program is envisioned to provide separators and recycling facilities in all marinas and fishing ports. State revenues dedicated to this program provide financing for the purchase of this equipment. The operators are responsible for operation and upkeep of this equipment (Craig Gallimore, personal communication). A similar program for Louisiana would be highly desirable if financing from state funds could be found.

The Rhode Island Sea Grant Advisory Service has established a working relationship

with the marina industry to ensure compliance with nonpoint source regulations resulting from the Reauthorization Amendments of 1990 to the Coastal Zone Management Act (EPA, 1993). Each facility is installing a waste oil receiving tank and developing an arrangement for removing the waste oil by private waste hauling and recycling services (Mark Amaral, personal communication).

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## **Appendix A**

### **Waste Oil Recycling Survey Form**

## WASTE OIL RECYCLING SURVEY

**Please fill in the correct answer:**

Parish in which you live \_\_\_\_\_.

Port or city where vessel is normally docked \_\_\_\_\_.

How many days do you fish each year? \_\_\_\_\_, hours per day? \_\_\_\_.

Vessel length \_\_\_\_\_ ft.

Engine type \_\_\_\_\_, Number of engines \_\_\_\_\_.

Horsepower? engine (1)\_\_\_\_, engine (2)\_\_\_\_, power plant\_\_\_\_\_.

Oil capacity? engine (1)\_\_\_\_, engine (2)\_\_\_\_, power plant \_\_\_\_\_ . (gallons)

How many times do you change engine oil each year? \_\_\_\_\_.

How much waste oil do you generate each time you change oil? \_\_\_\_\_ gallons.

**Please place a check by the correct response:**

What size containers do you use to carry the oil to the place where you dispose of it?

1. ( ) less than five gallon containers.
2. ( ) five gallon containers.
3. ( ) larger than five gallon containers.

How do you deal with used oil now?

1. ( ) leave it at the fuel dock for disposal.
2. ( ) leave it at the seafood buyer's dock for disposal.
3. ( ) carry it to a recycling center.

Name of dock or recycling center: \_\_\_\_\_.

4. ( ) other disposal procedure.

Where would you prefer recycling facilities to be located?

1. ( ) at a fuel dock.
2. ( ) at your seafood buyer's dock.
3. ( ) at a public docking facility.
4. ( ) at a location where it would have to be carried by truck.

In your opinion why is recycling of waste engine oil important?

**(Please check all that apply)**

1. ( ) necessary only because of penalties for improper disposal.
2. ( ) good for the health of the shrimp fishery.
3. ( ) good for the health of the environment in general.
4. ( ) not important, a waste of time and effort.

**Thank you for your cooperation.**

## **Appendix B**

### **Public Waste Oil Recycling Facilities in Coastal Louisiana**

## Public waste oil recycling facilities in coastal Louisiana (operating, pending, and needed)

Parish	Community/Port	Location	Status
St Tammany	North Shore L.Pont.	Recreational Marinas	Pending
Orleans	Rigolets	Not Determined	Needed
Orleans	Lake Pontchartrain	N.O. Mun. Yacht Harb.	Pending
St Bernard	Yscloskey	Not Determined	Needed
St Bernard	Delacroix	Not Determined	Needed
Plaquemines	Venice	Venice Marina	Operating
Plaquemines	Buras	Buras Marina	Operating
Plaquemines	Empire	Empire Shipyard	Operating
Plaquemines	Pointe A La Hache	Parish Marina	Operating
Jefferson	Lafitte	Not Determined	Needed
Jefferson	Lafitte	C & N Bayou Fuel	Operating
Jefferson	Grand Isle	Not Determined	Needed
Lafourche	Leeville	Griffin Marine	Operating
Lafourche	Leeville	Leeville Fuel & Ice	Operating
Terrebonne	Pointe Au Chien	Chauvin	Needed
Terrebonne	Cocodrie	Not Determined	Needed
Terrebonne	Dulac	Scottco's	Pending
Terrebonne	Bayou Du Large	Theriot	Needed
St Mary	Cypremort Point	Not Determined	Needed
Iberia/Vermilion	Delcambre	Not Determined	Needed
Vermilion	Intracoastal City	Not Determined	Needed
Jefferson Davis	Lake Arthur	Shrimpers' Canal	Operating
Cameron	Grand Chenier	Not Determined	Needed
Cameron	Cameron	Not Determined	Needed
Cameron	Hackberry	Not Determined	Needed

## **Appendix C**

### **List of Companies Presently Collecting Waste Oil from the Fishing Industry in Coastal Louisiana**

List of Companies Presently Collecting Waste Oil  
from the Fishing Industry in Coastal Louisiana

Action Waste Oil Service, Inc 13182 Galloway Garden Walker, LA 70785	(504) 664 4222
Bodin's Oil Co. Erath, LA 70533	(800) 624 1991
Cure's Used Oil Service 300 Meadow Drive Violet, LA 70092	(504) 277 6019
Gottson's Enterprises Oil and LPG Transporters 2035 Evangeline Highway Jennings, LA 70546 Mr. Nolan	(318) 824 3171
International Petroleum Corporation 14890 Intracoastal Dr. New Orleans, LA 70129	(800) 523 9071
Maritime Oil Recovery Inc. PO Box 422 Belle Chasse, LA 70037	(504) 361 8991 Yard (504) 361 1330
Safety Kleen, Used Oil Division Pineville, LA 71360	(318) 640 2747
Safety Kleen 14 26th Street Kenner, LA 70062 John Lapre', NOLA rep.	(504) 466 5718 Fax (504) 466 2373
Specialty Environmental Services 10338 Mammoth Ave. Baton Rouge, LA 70814	(800) 256 3227 (504) 927 3227 Fax (504) 925 0613

## **Appendix D**

### **List of Manufacturers and Vendors Selling Equipment Useful in Waste Oil Recycling Operations**



List of Manufacturers and Vendors Selling Equipment  
Useful in Waste Oil Recycling Operations

<u>Vendor</u>	<u>Product Line</u>
Tech Oil Products, Inc. John Zimmer, President 4308 W. Admiral Doyle Dr. New Iberia, LA 70560 318 367-6165 318 367-9956 FAX	ENVIRO-PAK Oil Filter Crushers, Pneumatic and Electric, 13" x 9" to 44" x 12"
FIBREX, INC.  3724 Cook Blvd. Chesapeake, VA 23323 1-800-346-4458	Self-contained Used Oil Collection Systems 55 gal., 325 gal., 450 gal. Absorbent Pads
Vital Visions Corporation  9663 Hwy. 20 West Freeport, FL 32439 904 835-3131 904 835-4768 FAX	Self-contained Used Oil Collection Systems 300 gal., 325 gal., 400 gal.
Louisiana Energy Service Savers, Inc. (LESS) Richard Gauthier (504) 369-2423 (504) 935-7818 Pager	Biodegradable Absorbent Pads
Landa Water Cleaning Systems 13705 NE Airport Way Portland, Oregon 97230 (503) 255-5980 1-800-535 9164 FAX	Oil/Water Separators

National Fluid Separators, Inc.

827 Hanley Industrial Court  
St. Louis, MO 63144  
(314) 968 2838  
(314) 968 4773 FAX

Oil/Water Separators: Dockside and Bilge Mounted

OilTrap Environmental Prod., Inc.

3111 Dorchester Drive  
Olimpia, WA 98512  
1-800-943 6495  
(206) 352 0931 FAX

Oil/Water Separators: Portable, Dockside, and Bilge Mounted

Spill Removal Products, Inc.

2314 Chimney Rock  
Houston, TX 77056  
(713) 266-2777  
(713) 266-6409 FAX

Products and Services for the Prevention and Remediation of Oil Spills  
Oil Trap Filtration Systems  
INDUSORB Hydrocarbon Solidifying Products