Maine Vertical Line Risk Reduction Conservation Equivalency Proposal Under the Atlantic Large Whale Take Reduction Plan (ALWTRP)

The Maine Department of Marine Resources submits the following concepts to reduce the risk of vertical lines to large whales. The National Marine Fisheries Service (NMFS) has given no guidance on the amount of risk that needs to be reduced or modified to make an impact on the rate of serious injury and mortality to humpback and right whales. Without guidance, NMFS has asked states and affected industries to identify the very regulations that will be imposed on them without knowledge of whether or not what is suggested will be enough to produce the desired outcome. Regulations such as these come at a great cost to the largest fishing industry in Maine. A target is not just desirable, but absolutely necessary to ensure that no undue burdens are assessed on the fishing industry. Until a target is produced by NMFS, DMR and its constituents will not commit to a particular risk reduction strategy or fishing industry generated goal for the conservation of these species. DMR is committed to working with NMFS on developing an adaptive management strategy where using the best available science and conservation benefit credits will continually guide our risk reduction strategy.

Throughout the spring and summer of 2011, DMR held a series of meetings to get industry involved in the development of the suite of conservation measures outlined below. These are intended to reduce the risk of serious injury and mortality of large whales due to entanglements in vertical lines from commercial fishing gear. With input from industry, DMR submits the following suggestions for your consideration and analysis:

1) *Location*
   Vertical line risk reduction measures should be regulated and restricted to outside of the three mile limit.

   DMR supports using the NMFS co-occurrence model to define the areas that will be managed by these vertical line risk reduction measures. This includes all measures between the 3 and 12 nautical mile lines (Figure 1 (a-b)). These areas include the seven Lobster Management Zones (A-G east to west) and federal fishing waters in zones of “3-12” miles and “12+” miles from shore.

   If humpback whales should be down or de-listed during the status review for this species, measures that are implemented in areas of co-occurrence driven by humpback whales must be rolled back.

   a. The fishery addressed throughout this risk reduction proposal is the lobster fishery. Using the best available data, the baseline and resulting measures presented below are specific to the Maine lobster industry.

2) *Baseline*
   All baseline numbers presented here were calculated using information from DMR’s 2009 lobster gear survey and the 2009 100% dealer reporting database. While these are the datasets that were provided to NMFS to build the co-occurrence model, it is likely that the baseline and reduction calculations will vary. The co-occurrence model takes alternate data sources, such as Vessel Trip Reporting data, into account while the numbers presented here do not.

   a. The number of vessels is reported by area in Table 1. Table 2 represents the baseline calculated from a voluntary industry survey corrected for actual amounts of gear used, the configurations in which that gear is typically set and latent effort calculated through 100% dealer reporting. Additional information on the types and lengths of rope fished, surface systems and secondary flotation, as well as configurations of traps (traps on a string) used can be found in Tables 3a and 3b and Figures 2a-m.

   b. The number of vertical lines in each area is outlined in Table 2. These numbers were calculated in the following manner using data taken from the voluntary 2009 lobster gear

survey. Each respondent reported the number of traps that they fished in each area by month, as well as the configurations in which that gear was set. From this information, the following equations were used:

1. (# of traps fished) / (configurations used) x (the # of vertical lines per configurations) (1 for 5 traps and less, 2 for 6 traps and more). This number was summed for all gear fished in each area and month and then divided by the # of responses = vertical lines per fisherman unit in that area and month
2. # of licenses per month and Lobster Management Zone (federal permit holders only) that landed > 100 lbs of lobster = # of active fishermen in that zone and month
3. (total licenses purchased in that zone) x (% of active fishermen) x (vertical lines per fisherman unit) = baseline # of vertical lines per month and zone

c. There are several types of latent effort that DMR has been defining and dealing with throughout this process. The typical definition of latency would be any license or permit holder that did not fish any gear at any time during the year. According to DMR's 100% dealer reporting records for 2009, about 30% of the licensed fishery did not sell any lobsters to a licensed dealer (1788 licenses not recorded out of 6116). There are two additional levels of latency that were taken into account during the calculations for the baseline amount of vertical lines in the Maine waters. These include both seasonal latency, license holders that only fish during parts of the year, and trap latency, license holders who fish less than their allotted maximum trap limit. Fishing less than your allotted maximum trap limit is compensated for in the equation to calculate the number of vertical lines per fisherman unit. Seasonal latency is accounted for through dealer reporting. A breakdown of the percentage of latency by area and month can be seen in Tables 4a and 4b.

3) Management Approach

Below are some ideas that have been put forward for reducing the risk of entanglement in vertical lines. This list is neither intended to be exhaustive nor do all measures suggested need to be included in the final rule. DMR is proposing this suite of options as a way to allow NMFS to calculate the conservation benefit achieved by these ideas and the conversation within the ALWTRT regarding whether or not a target can be decided on and met by measures such as these.

a. DMR supports an area-based approach to reducing the risk of vertical lines to large whales in Maine. This should include broad-scale measures in co-occurrence areas by region year round. These broad-based measures should vary slightly by region or Lobster Management Zone depending on the current fishing strategies in each area. During meetings across the State of Maine, DMR heard broad support for a standardized triple minimum in federal waters for most of the state, including all of Zones A-E from 3-12 miles. Zones F and G could go to 8 trap minimum trawls from 3-12 with one area in Zone G (Figure 3) that could go to a triple minimum only. DMR would request that this broad-scale modification allow for some exemptions due to local fishing practices, and boat size exemptions. Additional strategies, including all of the potential minimum trawl lengths outside of 12 miles are outlined in Table 5. Additionally, Tables 5 and 6 outline the percent and number of vertical lines that are reduced by the proposed minimum trawl lengths. DMR does not support the use of only one vertical line on trawls greater than five.

b. The number of vertical lines that would remain in each area can be seen in Table 6.

c. DMR does not support seasonal or year round closures as a risk reduction strategy. Closures in federal waters are not a feasible option, particularly from an enforcement perspective, since boats from other states would still be allowed to fish the proposed closed area. Broad-based vertical line risk reduction measures can be implemented year round despite the timing of elevated co-occurrence scores. Fishermen cannot be expected to change their gear several times a year to accommodate seasonal regulation changes.

d. DMR believes that the concept of a vertical line cap should remain available for discussion and development. This method could be preferable for the ease of enforcing and tracking latency, as well as allowing additional flexibility within the industry to allow fishermen to rig and fish as many traps under their maximum limit as needed in the configurations that work in their area seasonally.

    i. All license holders would be eligible in the vertical line pool, which would be set at a reduced level similar to the reduction percentages achieved by the measures listed above.
    ii. A maximum number of vertical lines will be offered to each license holder to purchase tags for marking their vertical line just under the buoy. The number of tags available to each fisherman will be calculated by dividing the number of vertical lines allowed in the system equally across license holders.
    iii. Vertical lines will be tracked by requiring tags to be attached to the vertical line just below the buoy.

e. Latent effort will be monitored through mandatory annual reporting for federal permit holders, which is discussed below. If a vertical line cap system is put into place, then there will be no reason that latency should increase the number of vertical lines since that potential is already calculated into the vertical line allocation for each fisherman. If minimum trawl lengths are instituted for different areas, then latency will be monitored through the reporting system and an increase in the number of vertical lines by 10% that occurs for three consecutive years will result in DMR taking action to bring the number of vertical lines back within an acceptable range.

f. DMR does not have any new gear technologies that it would like to introduce into the discussion at this time. However, there are several best practice options that DMR would like NMFS to assess to determine the conservation benefit.

    1. DMR has had many conversations with the industry and secured broad, but not unanimous, support for the idea of a weaker top rope. This would include fishermen tying or splicing 11/32" or smaller diameter rope into the top 1/4 or 1/3 of their vertical lines. Preliminary data (not peer reviewed) out of the New England Aquarium has suggested that weaker vertical lines may reduce the risk of an entanglement resulting in serious injury or mortality for all age classes of right whales. This method has not been through field trials, but DMR intends to test it both in the field and in the laboratory during the fall and winter of 2011 so that data on both the industry use and potential conservation benefit can be presented to the ALWTRT in January of 2012. Baseline information regarding the diameters of vertical lines fished currently can be seen in Tables 3a and 3b. Many areas already fish vertical lines with diameters at or below 11/32". DMR expects NMFS to incorporate that data into the co-occurrence model and to receive an appropriate conservation benefit credit to be applied to risk reduction calculations.

    2. DMR supports a mandated maximum length between floats in surface systems when they are used. The industry can decrease this length to a maximum of 8 fathoms. The current lengths reported in the 2009 gear survey can be seen in Table 3a. In addition, DMR supports eliminating the allowance of float rope at the surface between the buoy and high flyer or between more than one buoy in the surface system. DMR expects to receive a credit for risk reduction for the gear that already uses surface systems with shorter than 8 fathoms between floats and for surface systems that are not using float rope between floats.

    3. DMR also recommends that universal requirements (wet storage, the choice of weak links, etc.) be reinstated in exempted waters throughout areas affected by the ALWTRP. DMR currently still has these requirements in regulation and plans to

continue to require these of fishermen in exempted waters. This results in a risk reduction that is above and beyond what is required of the state and the lobster industry and DMR requests that NMFS evaluate this conservation benefit in the calculation of risk reduction as well.

4. DMR requests that NMFS evaluate the use of an 1,100 pound breakaway on trap/pot gear set east of Petit Manan. Fishermen are using gear that is consistent with the offshore gear, whereby an 1,100 pound breakaway is necessary. A 600 pound breakaway is not adequate in tidal areas where the heavier gear type is set.

4) A combination of the measures presented here will reduce the risk due to vertical lines by both decreasing the likelihood that humpback and right whales will encounter lines, as well as reducing the severity of entanglements by instituting some best practice gear modifications and broad-based measures.

a. It is DMR's position that this federally mandated plan must be monitored for effectiveness by both monitoring the increase or decrease of entanglement and scarification rates, as well as instituting mandatory reporting for federal permit holders on an annual basis. Reporting the number of traps and vertical lines used by month in each reporting area will be sufficient to monitor any changes in the number of vertical lines being used within the fishery, as well as trends in latency of both active licenses and the seasonal use of traps. This can be done in a manner similar to a pilot program that DMR instituted in collaboration with NMFS in 2009 that sent "annual logs" with license renewal materials. This methodology is widely preferred to trip level reporting due to the minimal time it takes to fill out, and that it doesn't require landings data. DMR asserts that it is the responsibility of the federal government to outline, implement and fund these programs. DMR is willing to help NMFS implement and run these programs on a local level if long-term federal funds have been put in place.

b. DMR supports additional gear marking strategies and requests a unique marking color for the State of Maine, separate from nearby critical habitats in Massachusetts and other areas. Maine should continue to use the first colored marker for Area 1 as a whole (red), and then a second color to identify it as a Maine vertical line. Additional colors could further represent regions of Maine (Downeast Zones A and B, Midcoast Zones C, D and E and Southern Zones F and G). NMFS and the ALWTRT should determine where on the vertical line this additional mark should be located by assessing gear taken off of entanglements and making determinations for which parts of the line would be most beneficial.

c. Maine Marine Patrol (MMP) will continue their Joint Enforcement Agreement with the NOAA Office of Law Enforcement (OLE) to enforce regulations implemented by the ALWTRP. DMR is confident in the MMP's ability to enforce local measures that are put into place instead of single broad-based measures that create undue burdens on Maine's fishing communities. Continued excellence has been demonstrated by MMP through the documentation of high compliance rates within the industry on previous entanglement risk reduction measures. Compliance surveys completed in 2009 and 2010 yielded compliance rates coast-wide of 93% with the sinking groundline gear modification. MMP has the unique ability to enforce gear modification requirements in the ALWTRP through a trained work force of law enforcement personnel and a fleet of boats that have been rigged to haul and inspect lobster gear. Regulations including minimum trawl lengths, vertical line caps, and gear modifications can all be enforced by MMP.

   DMR and MMP requires support, financial and in the prosecution of cases, from NMFS and OLE to maintain the high rates of compliance with ALWTRP regulations discussed above. Recently, the MMP documented several significant violations of ALWTRP. These violations were referred to OLE for prosecution. MMP personnel were told by OLE to prosecute these violations in State court. Without support from OLE, small state fines will not provide a deterrent and could be seen as a cost of doing business. To accomplish our goal of voluntary

compliance through education and vigorous enforcement will be difficult to achieve without OLE support for permit sanctions and/or large monetary penalties through our Joint Enforcement Agreement with OLE.

5). As stated above, DMR believes that a combination of the measures presented here will reduce the risk due to vertical lines by both decreasing the likelihood that humpback and right whales will encounter lines, as well as reducing the severity of entanglements by instituting some best practice gear modifications and broad-based measures.

Trawling up thresholds, vessel size, safety and fishing efficiency must be considered. Management options must be operationally feasible and not impose an undue economic burden on fishermen. Fishermen need flexibility in the vertical line rule, including a potential suite of gear modifications to choose from.

Figures and Tables:

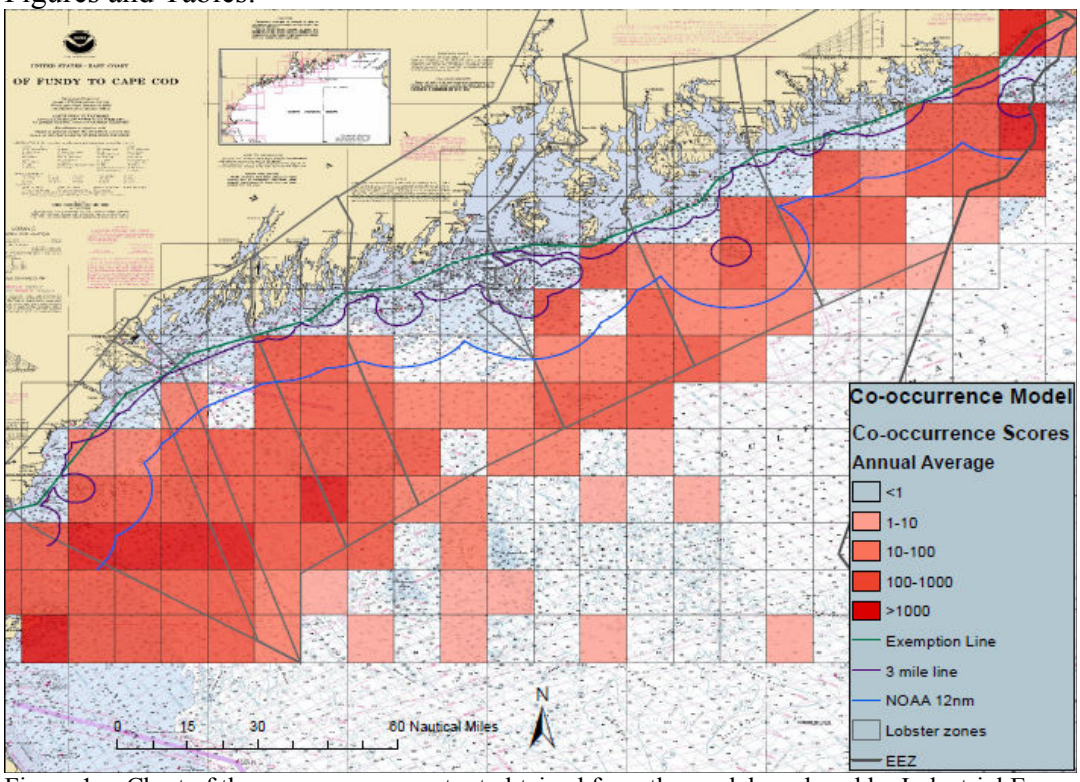

Figure 1a. Chart of the co-occurrence output obtained from the model produced by Industrial Economics, Inc. for NMFS and the ALWTRT. This output displays annual co-occurrence scores using 2008 data for right and humpback whales, as well as the boundaries for the exemption line, 3-mile and 12-mile lines and the Lobster Management Zones.

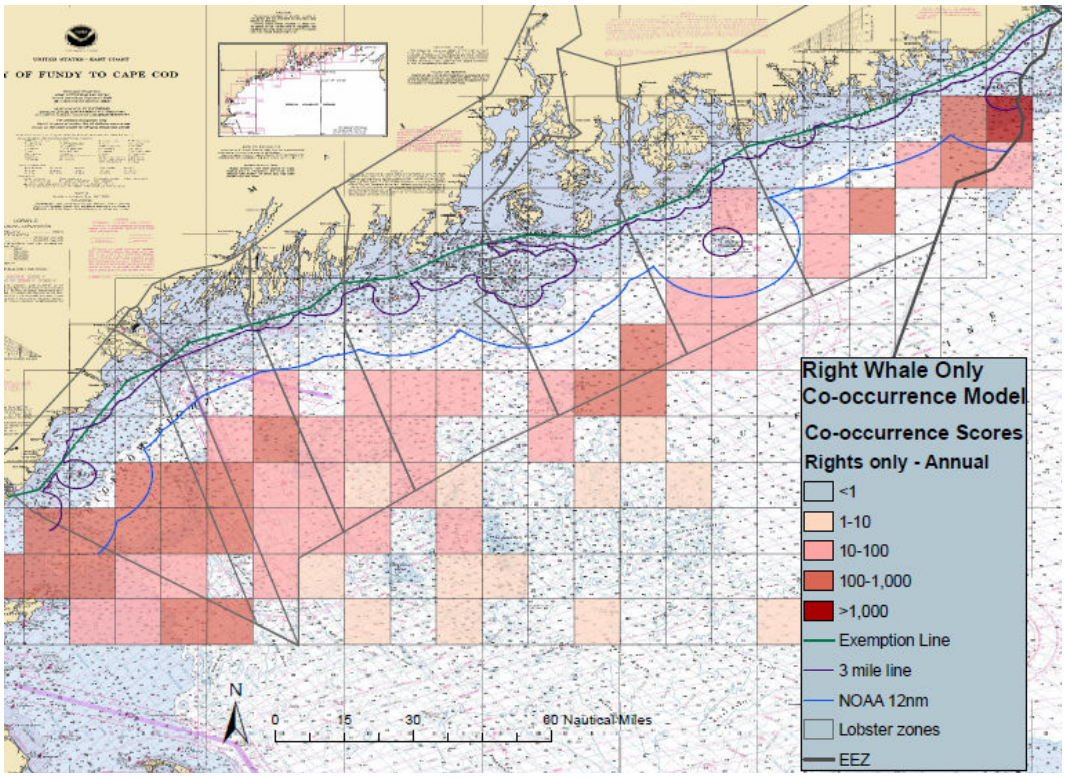

Figure 1b. Chart of the co-occurrence output obtained from the model produced by Industrial Economics, Inc. for NMFS and the ALWTRT. This output displays annual co-occurrence scores using 2008 data for right whales only, as well as the boundaries for the exemption line, 3-mile and 12-mile lines and the Lobster Management Zones.

Figures and Tables:

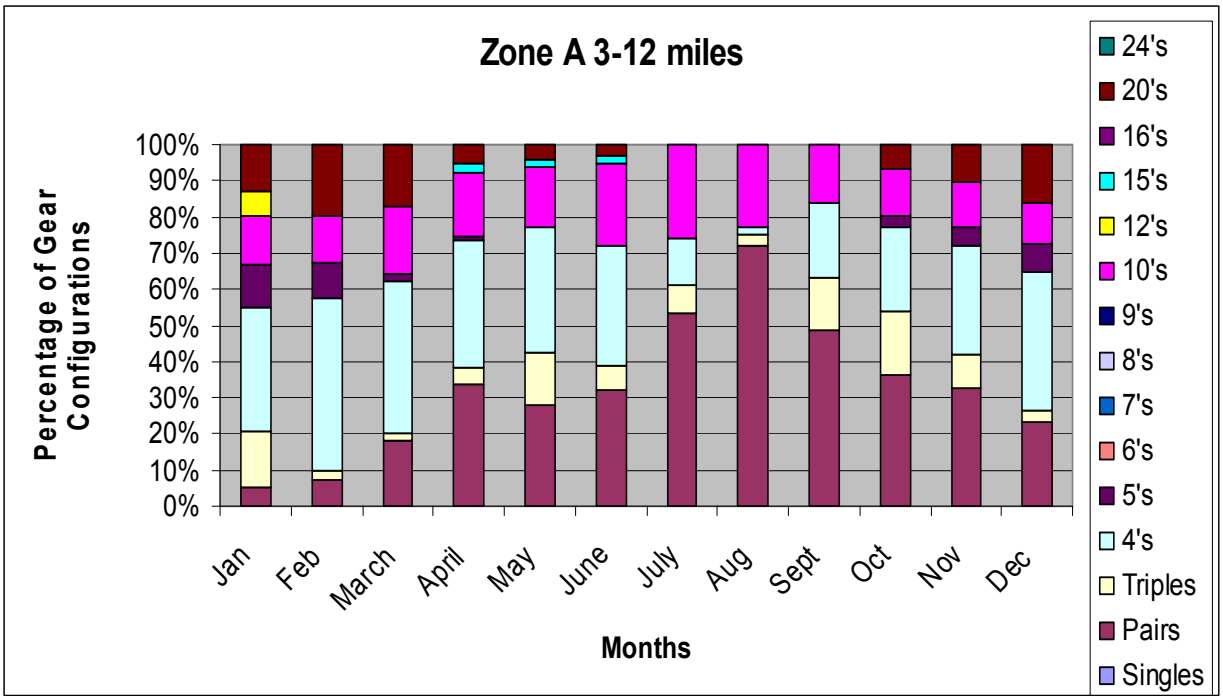

Figure 2a. The percentage of traps fished in each gear configuration recorded by respondents in Zone A from 3-12 miles. Figure does not reflect the amount or density of gear in this area.

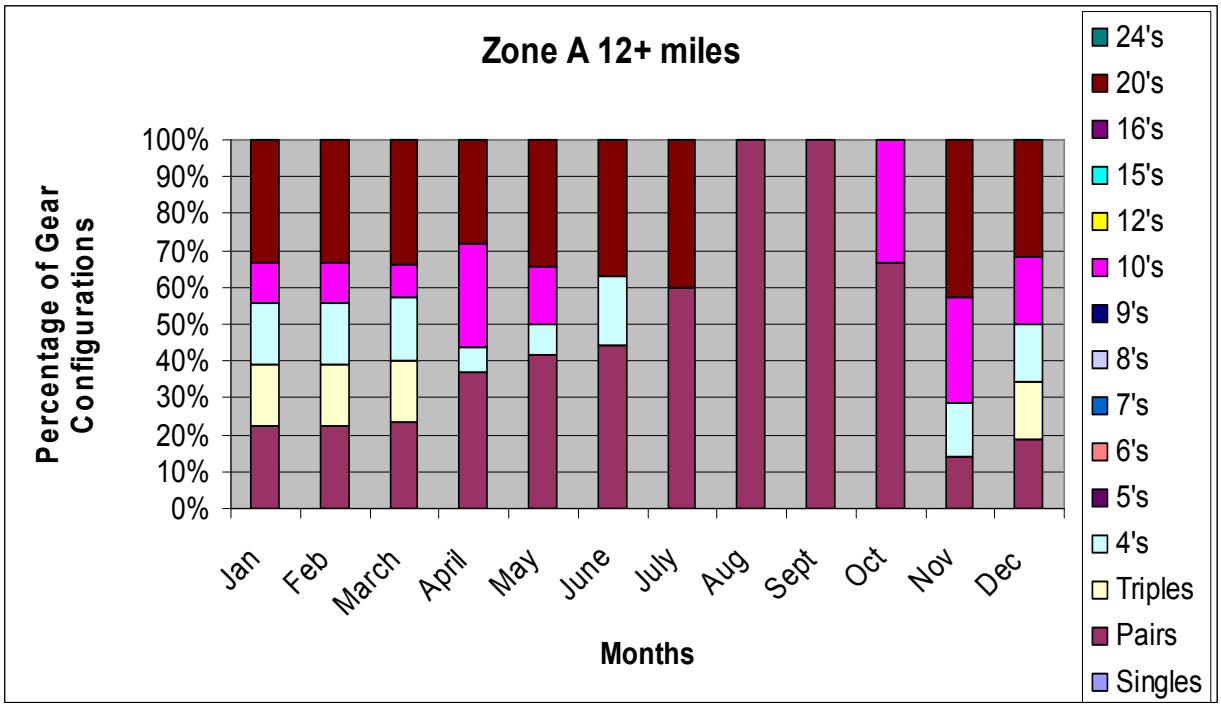

Figure 2b. The percentage of traps fished in each gear configuration recorded by respondents in Zone A from 12+ miles. Figure does not reflect the amount or density of gear in this area.

Figures and Tables:

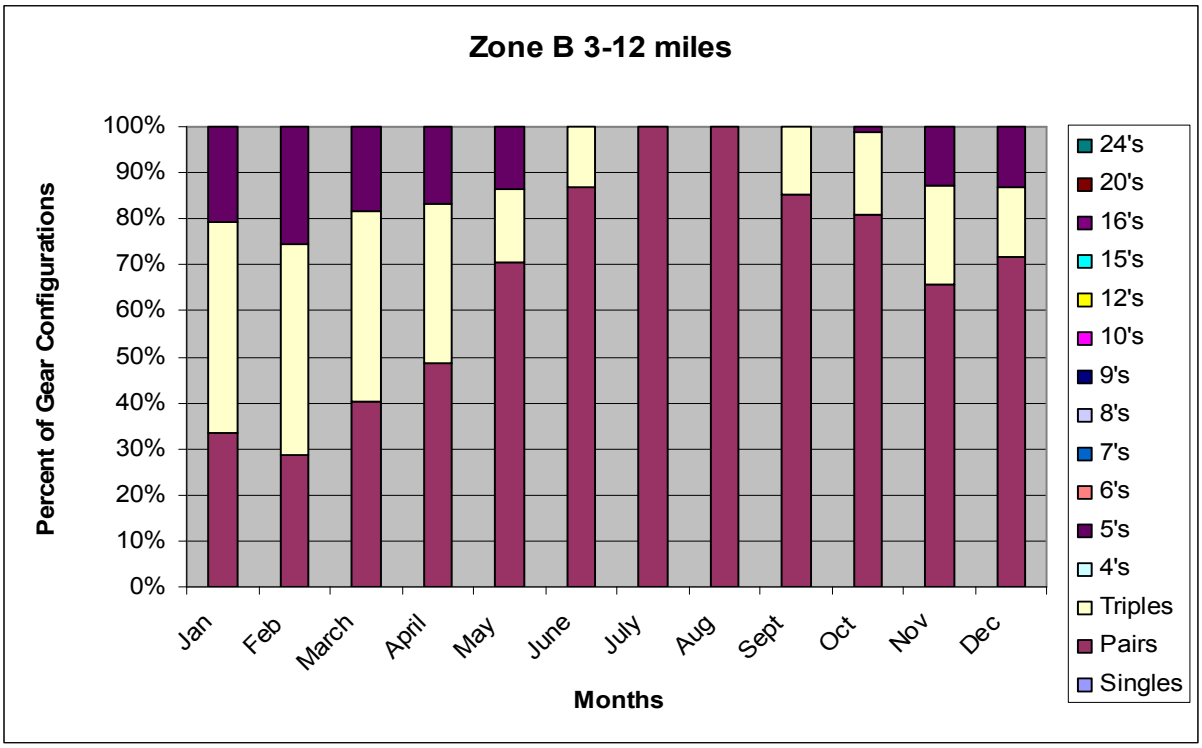

Figure 2c. The percentage of traps fished in each gear configuration recorded by respondents in Zone B from 3-12 miles. Figure does not reflect the amount or density of gear in this area. There is no figure for Zone B beyond 12 miles because no gear was reported there during the 2009 survey.

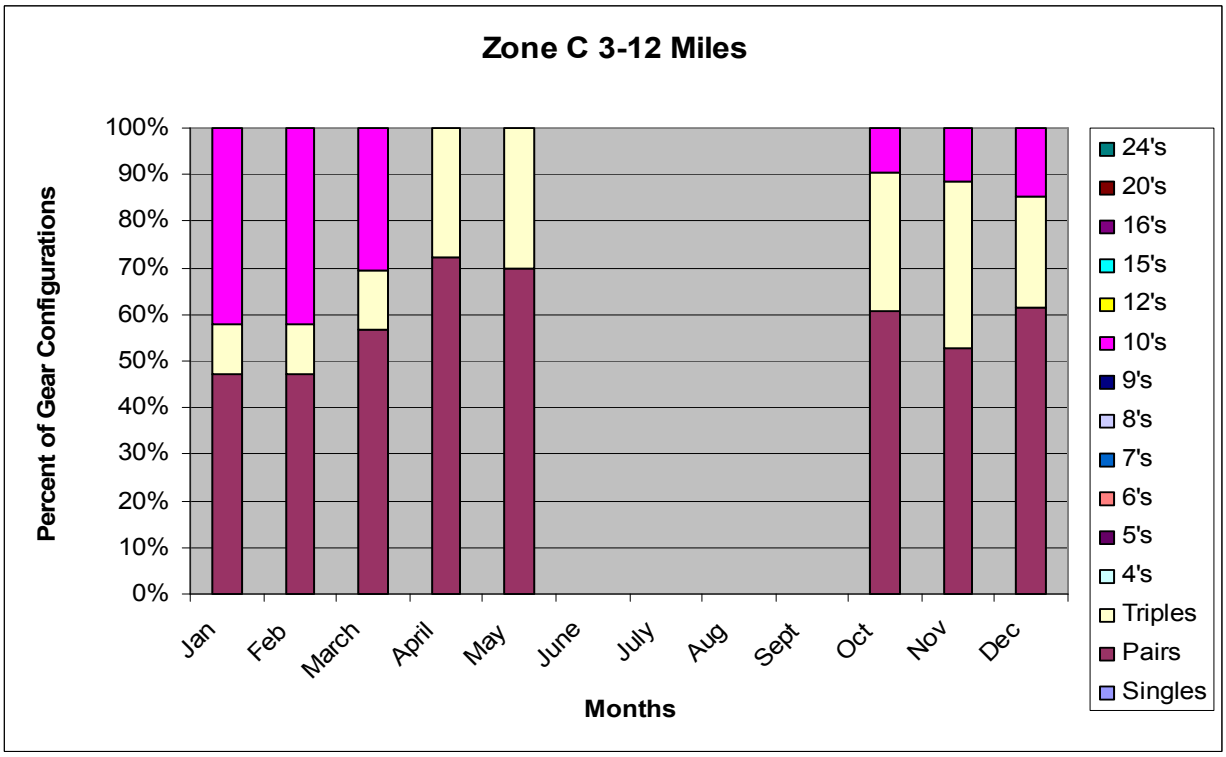

Figure 2d. The percentage of traps fished in each gear configuration recorded by respondents in Zone C from 3-12 miles. Figure does not reflect the amount or density of gear in this area. No gear was reported in this area from June through September.

Figures and Tables:

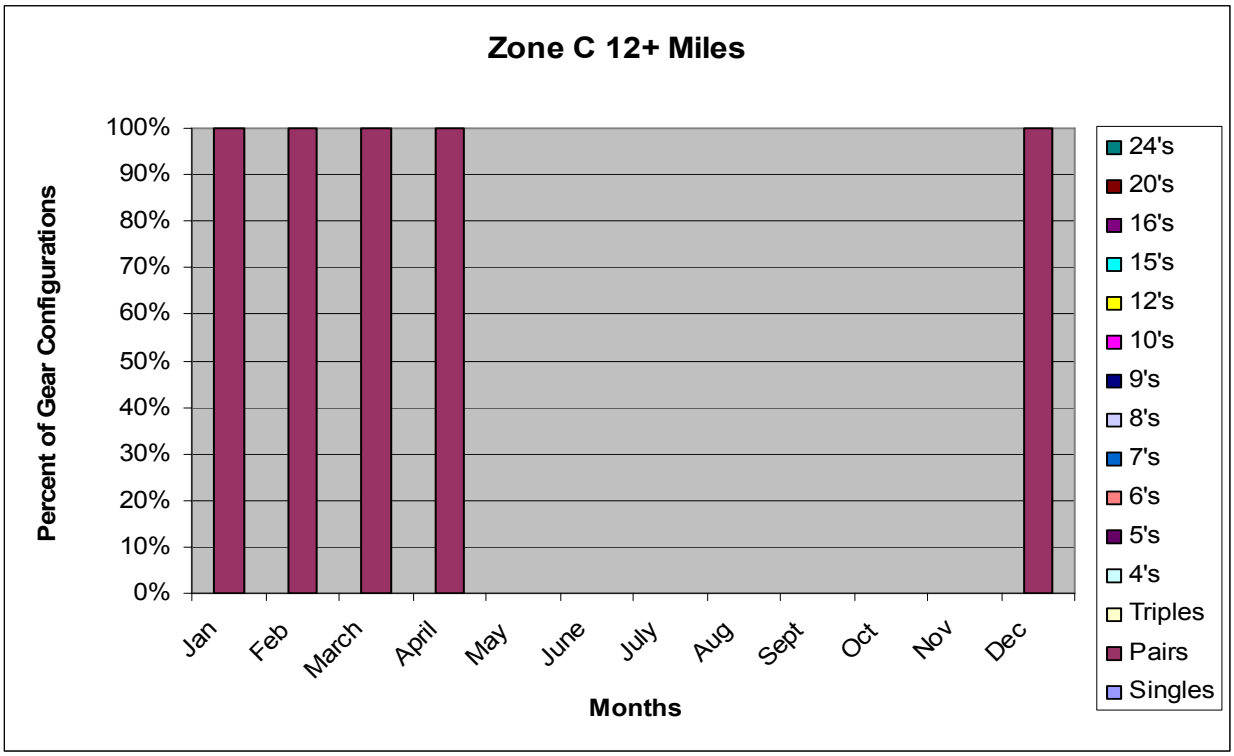

Figure 2e. The percentage of traps fished in each gear configuration recorded by respondents in Zone C from 12+ miles. Figure does not reflect the amount or density of gear in this area. No gear was reported in this area from May through November.

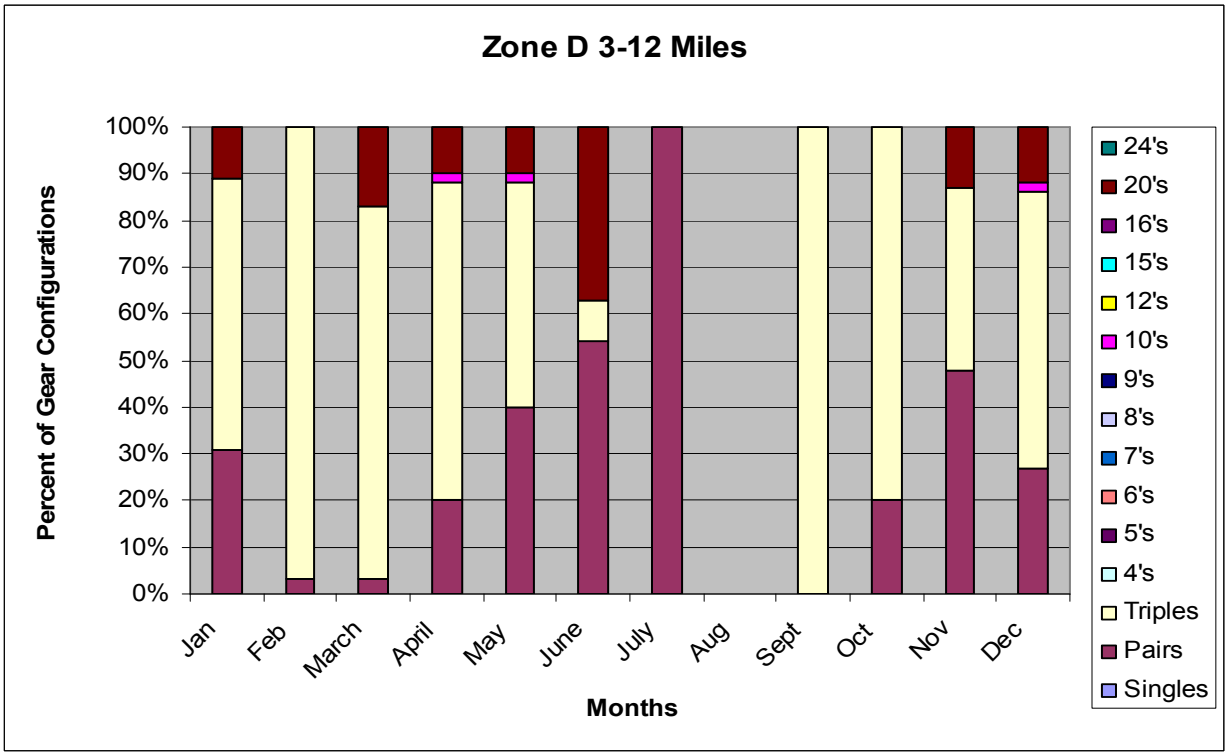

Figure 2f. The percentage of traps fished in each gear configuration recorded by respondents in Zone D from 3-12 miles. Figure does not reflect the amount or density of gear in this area. No gear was reported in this area in August.

Figures and Tables:

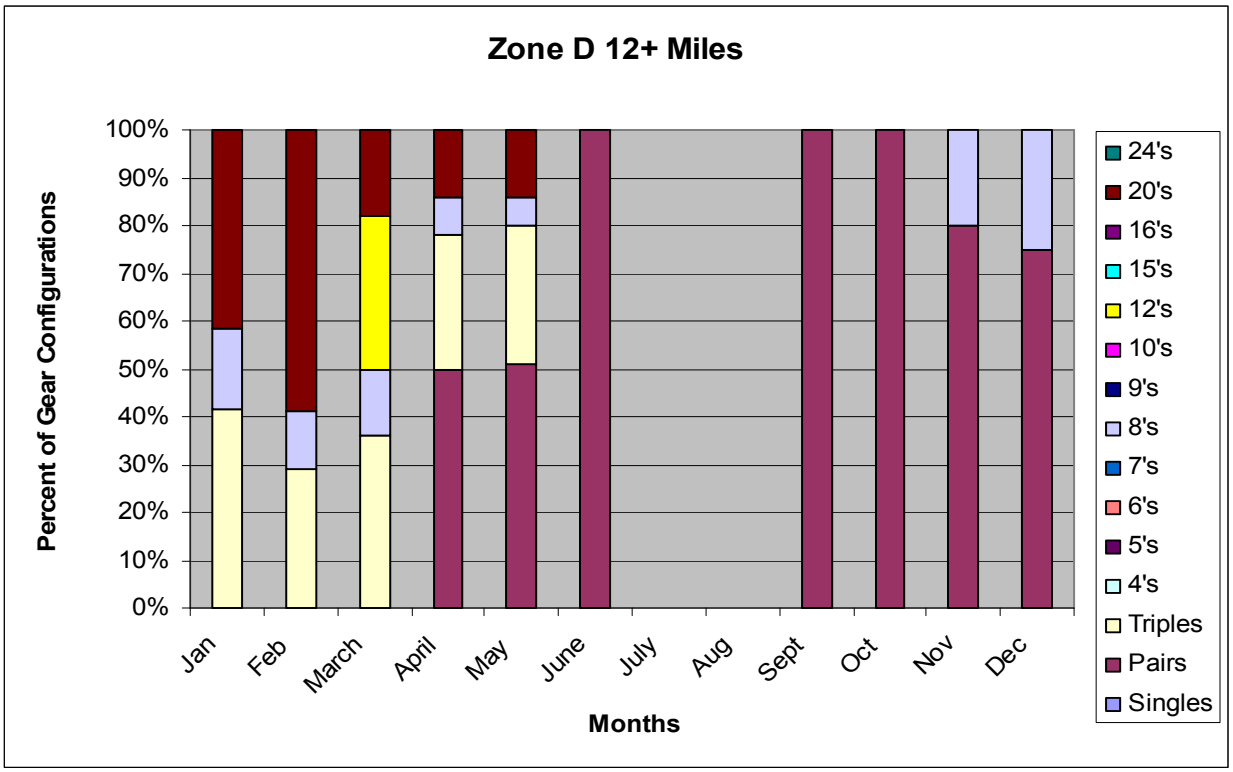

Figure 2g. The percentage of traps fished in each gear configuration recorded by respondents in Zone D from 12+ miles. Figure does not reflect the amount or density of gear in this area. No gear was reported in this area from July through August.

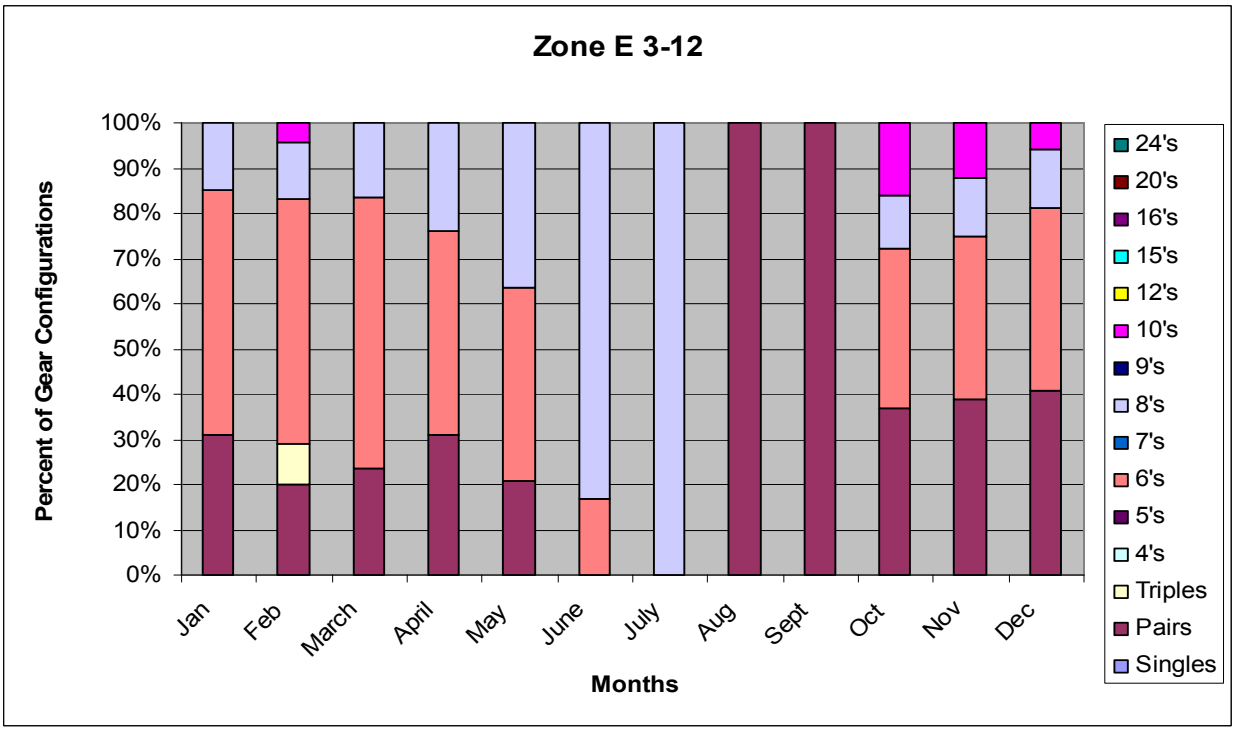

Figure 2h. The percentage of traps fished in each gear configuration recorded by respondents in Zone E from 3-12 miles. Figure does not reflect the amount or density of gear in this area.

Figures and Tables:

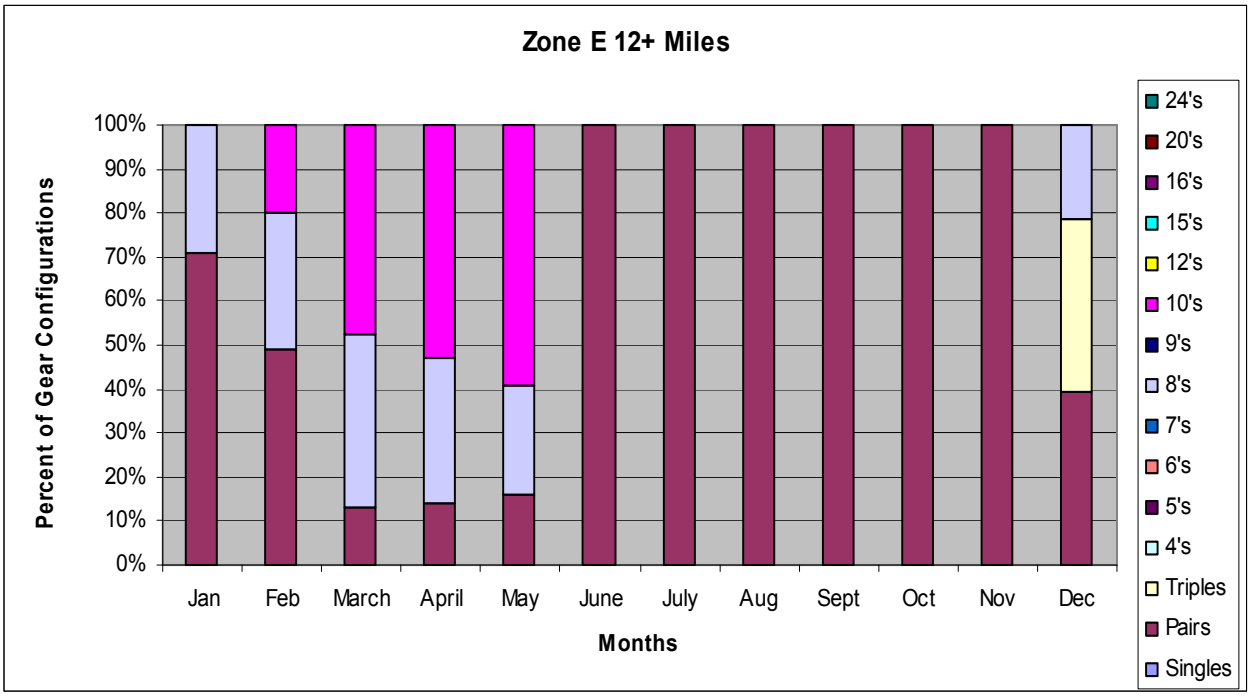

Figure 2i. The percentage of traps fished in each gear configuration recorded by respondents in Zone E from 12+ miles. Figure does not reflect the amount or density of gear in this area.

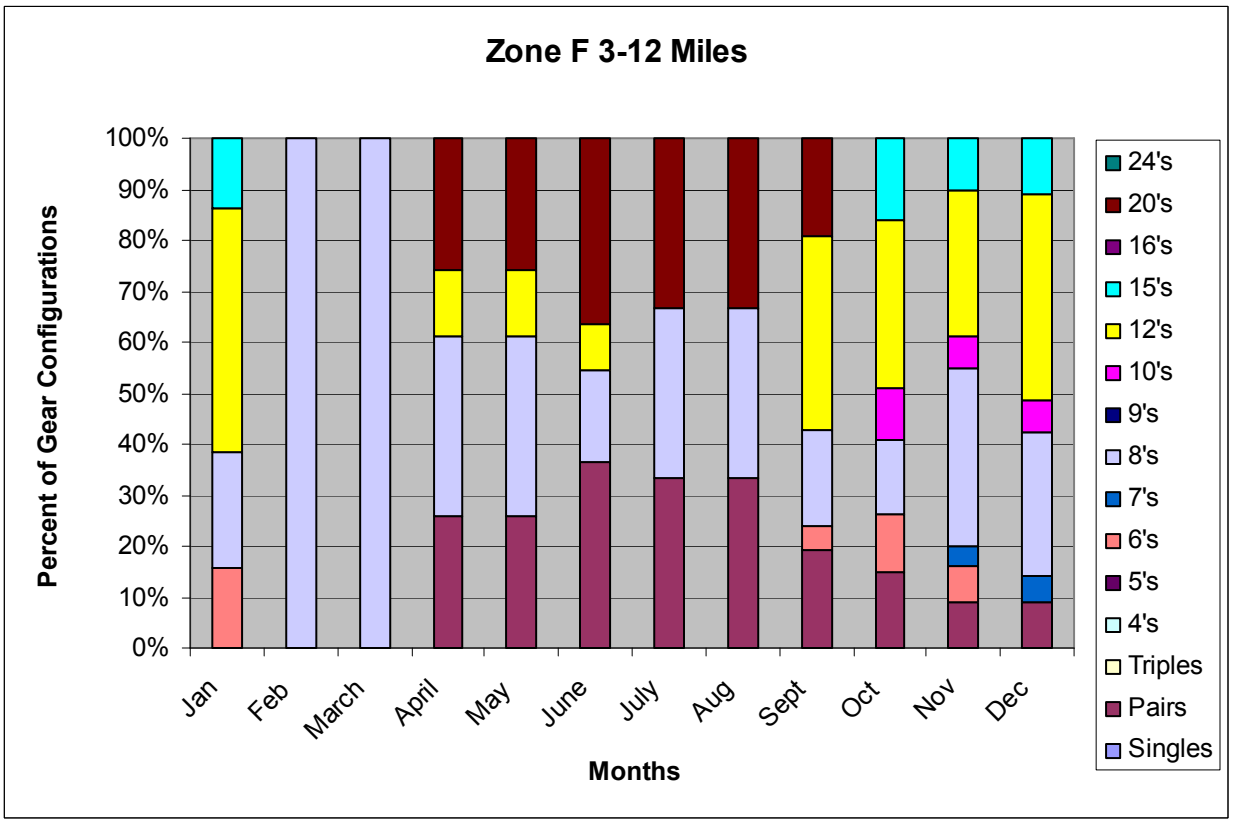

Figure 2j. The percentage of traps fished in each gear configuration recorded by respondents in Zone F from 3-12 miles. Figure does not reflect the amount or density of gear in this area.

Figures and Tables:

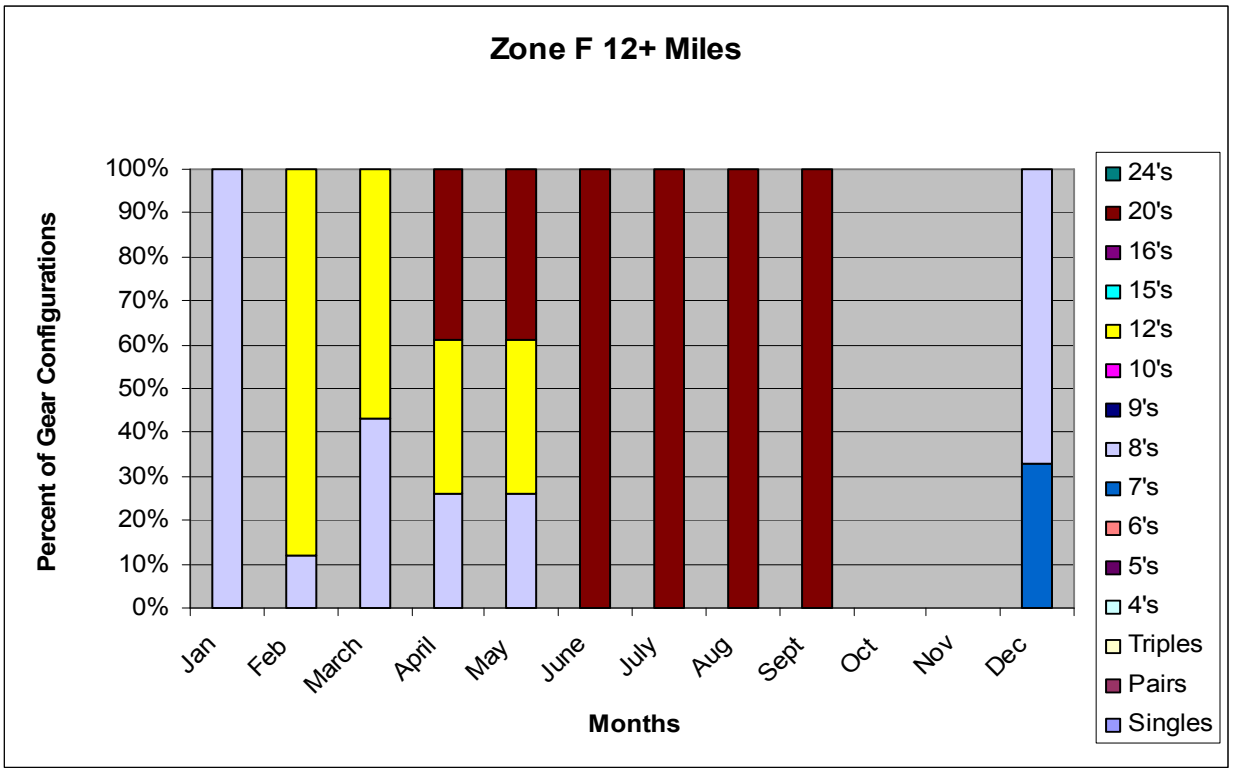

Figure 2k. The percentage of traps fished in each gear configuration recorded by respondents in Zone F from 12+ miles. Figure does not reflect the amount or density of gear in this area. No gear was reported from October through November in this area.

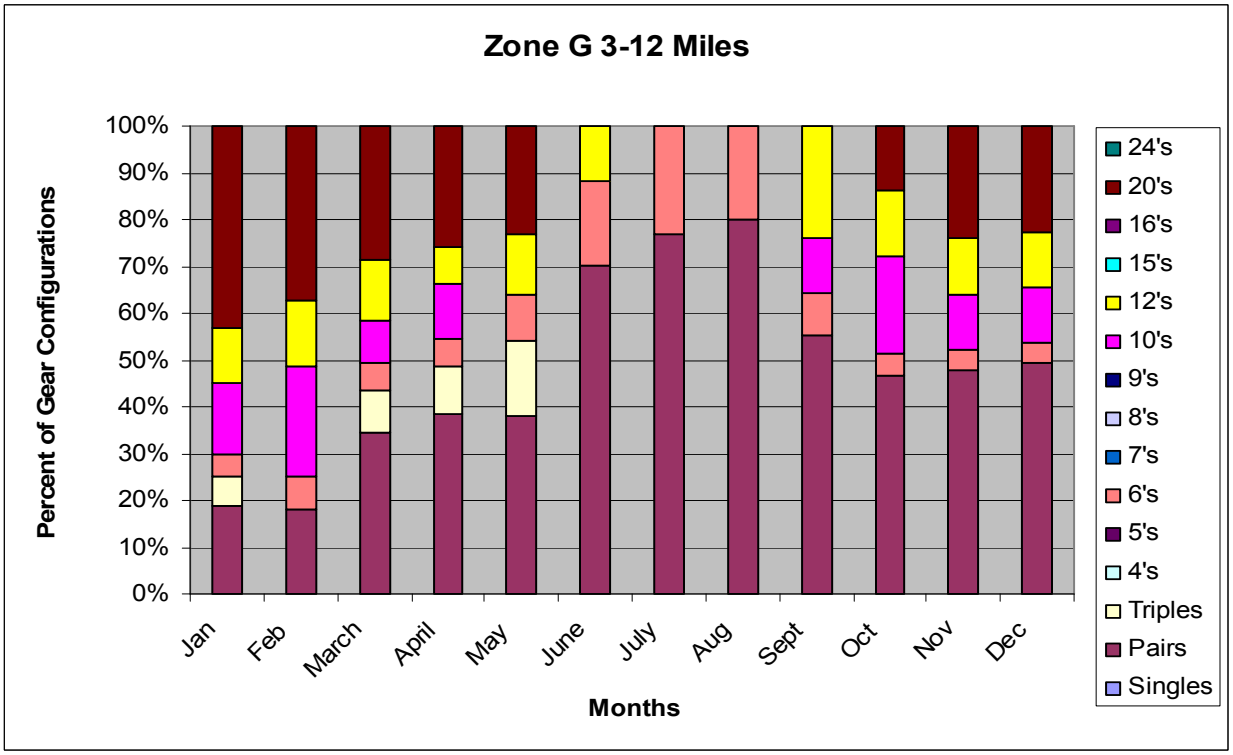

Figure 2l. The percentage of traps fished in each gear configuration recorded by respondents in Zone G from 3-12 miles. Figure does not reflect the amount or density of gear in this area.

Figures and Tables:

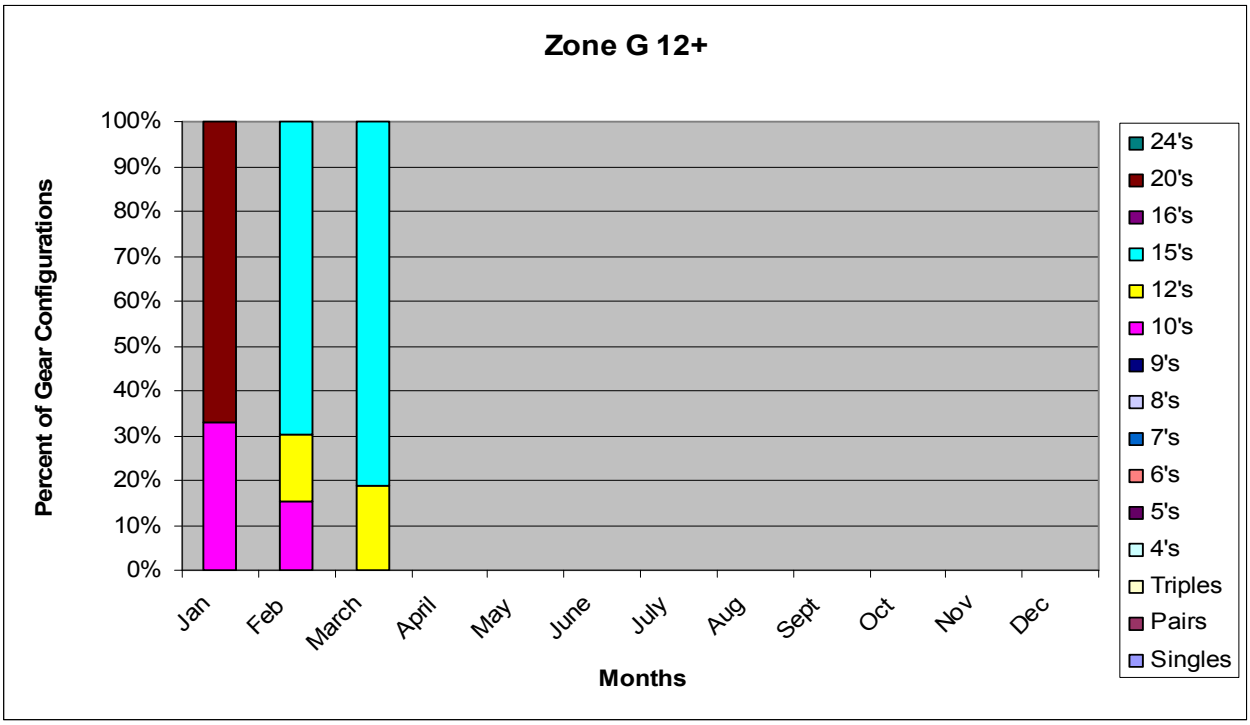

Figure 2m. The percentage of traps fished in each gear configuration recorded by respondents in Zone G from 12+ miles. Figure does not reflect the amount or density of gear in this area. No gear was reported from April through December in this area.

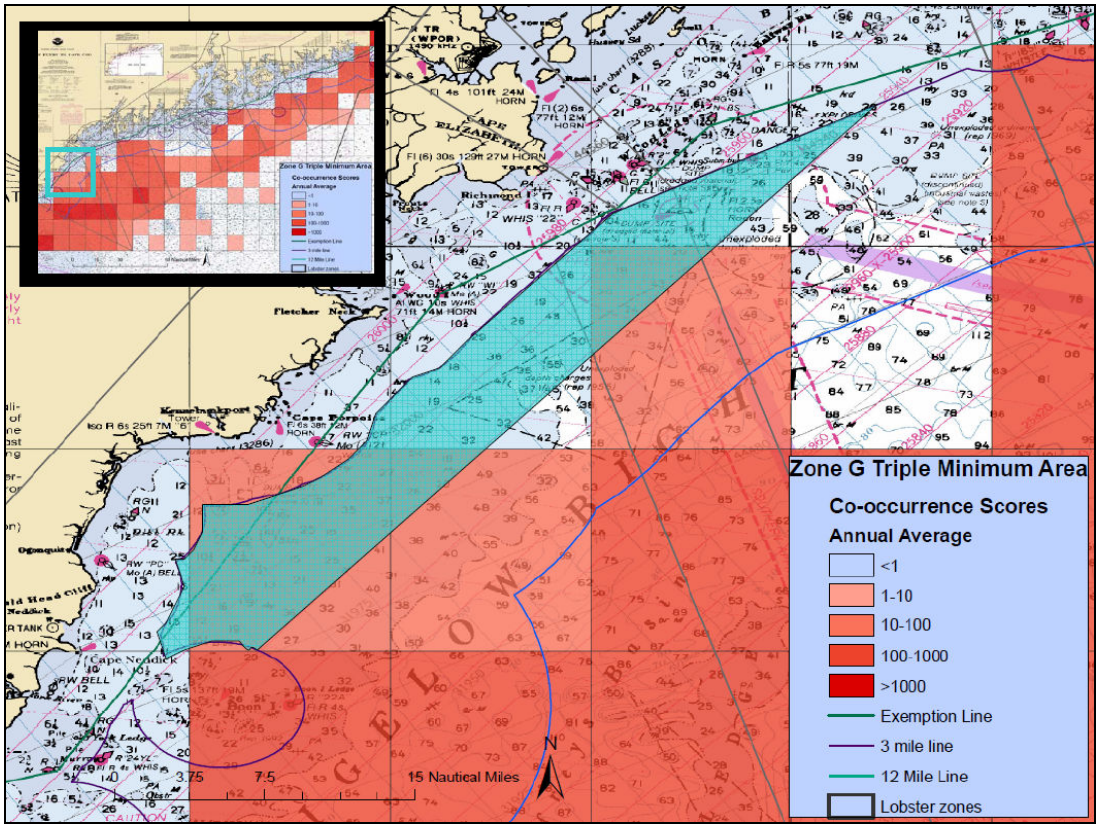

Figure 3. The area in blue represents the area in Zone G 3-12 miles (and into Zone F) that will be a triple minimum area. This area is outlined by the 3 nautical mile limit and the 25940 Loran line. The bottom type and style of fishing in this discrete area requires shorter configurations of gear. All other areas from 3-12 miles in Zones F and G will have an 8 trap trawl minimum.

Figures and Tables:

2010 Licenses Purchased													
	Zone	A	B	B SI	C*	D	D MI	E	F	G	Not Declared	**All Zones**	**Latency**
Inactive		302	111	9	252	316		172	378	161		**1,701**	**28%**
Active		845	431	64	726	856	11	371	604	302	66	**4,276**	**72%**
Total		1,147	542	73	978	1,172	11	543	982	463	66	**5,977**	

Table 1. The current number of lobster licenses sold by Lobster Management Zone in 2010 (Note – the baseline calculations for the number of vertical lines and reductions resulting from risk reduction measures are based on 2009 data. These data can be updated with 2010 license information once it is provided to NMFS and Industrial Economics for use in the model). This includes both federal permit and state license holders. Zone C is an open entry Zone, while all other Zones have a limited entry system.

Federal							
	Zone A	**Zone B**	**Zone C**	**Zone D**	**Zone E**	**Zone F**	**Zone G**
Jan	62899	14123	71792	78820	32709	27223	22793
Feb	49478	11192	58739	55148	21196	19802	17200
March	44100	10699	5740	43203	16929	11106	17895
April	15353	6903	11473	42036	9264	13855	15905
May	44934	5344	4870	35487	5129	7774	5471
June	36048	1977	-	6518	3834	3722	3469
July	27259	4089	-	1579	3846	3983	2806
Aug	31036	3061	-	-	3359	4817	3356
Sept	39652	8436	-	3055	5359	6716	6270
Oct	49543	18259	5516	9034	10024	6068	10224
Nov	68920	26839	16965	37844	19401	16875	15333
Dec	85476	21045	32525	62555	23260	32426	26591

Table 2. The extrapolated number of vertical lines per month in each Lobster Management Zone. The extrapolations were calculated as described in the text above. This is a representation of the baseline effort that exists within the lobster fishery according to the 2009 gear survey. The data is corrected for latent effort and does not represent any potential build up in the fishery either through a reduction in latency or the increased purchase of trap tags. The cells containing "-" indicate months in which gear was not reported to be fished in that area and month and therefore no risk reduction could be assessed.

Figures and Tables:

Areas		Length VL (fa)	Diameter VL (")	Toggles	Highflyer	Dist to Sec Float (fa)	Avg depth (fa)	VL length/depth	% of float
A 3-12	Avg	69		both	no	8	50	1.4	48%
	Min	35	11/32			4	20	1.8	45%
	Max	90	3/8			9	60	1.5	50%
A 12+	Avg	95		yes	both	8	54	1.7	49%
	Min	50	3/8			5	25	2.0	45%
	Max	180	7/16			30	100	1.8	50%
B 3-12	Avg	55		yes	no	8	40	1.4	47%
	Min	6	< 5/16			5			25%
	Max	80	7/16			10	60	1.3	60%
C 3-12	Avg	70		yes	no	7	57	1.2	56%
	Min	40	3/8			5	40	1.0	30%
	Max	100	7/16			10	80	1.3	75%
C 12+	Avg	80		yes	no	7	70	1.1	0%
	Min	80	7/16			7	70	1.1	0%
	Max	80	7/16			7	70	1.1	0%
D 3-12	Avg	54		both	no	19	43	1.2	43%
	Min	5	11/32			7	5	1.0	20%
	Max	90	7/16			50	75	1.2	66%
D 12+	Avg	73		both	both	32	49	1.5	34%
	Min	45	11/32			2	30	1.5	30%
	Max	100	7/16			90	70	1.4	55%
E 3-12	Avg	49		both	both	29	40	1.2	54%
	Min	20	5/16			2	10	2.0	20%
	Max	100	7/16			90	70	1.4	75%
E 12+	Avg	37				38	30	1.2	27%
	Min	4	5/16			2	5	0.8	0%
	Max	100	1/2			90	80	1.3	75%
F 3-12	Avg	41		both	both	27	34	1.2	18%
	Min	12	5/16			20	10	1.2	0%
	Max	70	3/8			39	65	1.1	30%
F 12+	Avg	52		both	both	50	43	1.2	0%
	Min	12	5/16			50	10	1.2	0%
	Max	90	7/16			50	80	1.1	0%
G 3-12	Avg	45		both	both	7	34	1.3	34%
	Min	12	3/8			3	16	0.8	0%
	Max	75	7/16			10	60	1.3	50%
G 12+	Avg	80		most no	both	5	66	1.2	17%
	Min	70	3/8			3	60	1.2	0%
	Max	100	3/8			6	80	1.3	22%

Table 3a. Summary of vertical line information recorded in the 2009 gear survey by area. "Both" in the Toggle and Highflyer columns indicates a mixed response for use. The "Dist to Sec Float" indicates the number of fathoms of rope between the marker buoy and the use of a secondary float either in the surface system or as a sub-surface toggle or float to keep the vertical line from contacting the bottom.

Figures and Tables:

	< 5/16	5/16	11/32	3/8	7/16	1/2	> 1/2
A Exempt	0%	4%	6%	59%	30%	0%	0%
A Non-exempt	0%	1%	12%	65%	22%	0%	0%
A 3-12	0%	1%	3%	57%	39%	0%	0%
A 12+	0%	0%	0%	80%	20%	0%	0%
B Exempt	1%	8%	12%	63%	13%	3%	0%
B Non-exempt	3%	6%	20%	62%	10%	0%	0%
B 3-12	3%	0%	5%	78%	14%	0%	0%
C Exempt	1%	8%	6%	67%	18%	0%	0%
C Non-exempt	0%	5%	0%	55%	41%	0%	0%
C 3-12	0%	0%	0%	59%	41%	0%	0%
C 12+	0%	0%	0%	0%	100%	0%	0%
D Exempt	2%	4%	5%	66%	18%	2%	3%
D Non-exempt	3%	3%	6%	65%	23%	0%	0%
D 3-12	0%	0%	11%	73%	16%	0%	0%
D12+	0%	0%	32%	28%	40%	0%	0%
E Exempt	0%	4%	10%	55%	31%	0%	0%
E Non-exempt	0%	23%	1%	62%	14%	0%	0%
E 3-12	0%	29%	6%	62%	3%	0%	0%
E 12+	0%	26%	12%	47%	0%	15%	0%
F Exempt	0%	4%	7%	53%	26%	3%	6%
F Non-exempt	0%	71%	0%	29%	0%	0%	0%
F 3-12	0%	11%	7%	82%	0%	0%	0%
F 12+	0%	38%	19%	38%	6%	0%	0%
G Exempt	0%	4%	9%	59%	29%	0%	0%
G Non-exempt	0%	0%	0%	84%	16%	0%	0%
G 3-12	0%	0%	0%	74%	26%	0%	0%
G 12+	0%	0%	0%	100%	0%	0%	0%
% of Total	**1%**	**5%**	**7%**	**63%**	**22%**	**1%**	**1%**

Table 3b. The percentage of vertical lines using different diameters of rope. 13% of the respondents report using rope at or below 11/32" diameter.

Figures and Tables:

ZONE A		Total Permits		287
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	137	134486	48%	52%
2	91	55769	32%	68%
3	88	47535	31%	69%
4	52	138625	18%	82%
5	202	383101	70%	30%
6	226	417832	79%	21%
7	263	794468	92%	8%
8	267	1558128	93%	7%
9	269	1853169	94%	6%
10	266	2508532	93%	7%
11	253	2041489	88%	12%
12	222	631640	77%	23%
Max	***269***	***10564774***	***94%***	***82%***

ZONE B		Total Permits		162
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	69	76312	43%	57%
2	55	27159	34%	66%
3	60	27968	37%	63%
4	73	75050	45%	55%
5	92	159623	57%	43%
6	95	141390	59%	41%
7	116	307374	72%	28%
8	120	954130	74%	26%
9	123	1027151	76%	24%
10	123	1189021	76%	24%
11	117	947328	72%	28%
12	106	368298	65%	35%
Max	***123***	***5300803***	***76%***	***66%***

ZONE C		Total Permits		148
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	98	193553	66%	34%
2	80	61149	54%	46%
3	78	53876	53%	47%
4	105	126593	71%	29%
5	119	243778	80%	20%
6	115	185903	78%	22%
7	135	793275	91%	9%
8	138	1600469	93%	7%
9	135	1512194	91%	9%
10	131	1377606	89%	11%
11	130	1216060	88%	12%
12	121	608911	82%	18%
Max	***138***	***7973366***	***93%***	***47%***

ZONE D		Total Permits		198
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	119	215350	60%	40%
2	96	65169	48%	52%
3	83	56960	42%	58%
4	120	128061	61%	39%
5	143	284389	72%	28%
6	153	186424	77%	23%
7	174	1833496	88%	12%
8	178	1366862	90%	10%
9	167	1273888	84%	16%
10	175	1327603	88%	12%
11	174	1220334	88%	12%
12	154	679552	78%	22%
Max	***178***	***8638087***	***90%***	***58%***

Table 4a. Summary of the total federal permit holders by zone (A – D) and how many of the permits are landing more than 100 pounds in a month. This results in a calculation of the number of active and latent permit holders, taking completely latent and seasonally latent permits into account when calculating the baseline amount of gear in each area.

Figures and Tables:

ZONE E		Total Permits		121
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	75	127543	62%	38%
2	56	40133	46%	54%
3	57	35493	47%	53%
4	63	54192	52%	48%
5	73	85417	60%	40%
6	84	75730	69%	31%
7	107	404937	88%	12%
8	106	460739	88%	12%
9	101	405426	83%	17%
10	102	472540	84%	16%
11	99	496186	82%	18%
12	96	292940	79%	21%
Max	***107***	***2951274***	***88%***	***54%***

ZONE F		Total Permits		181
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	81	134605	45%	55%
2	60	52285	33%	67%
3	62	39190	34%	66%
4	60	60731	33%	67%
5	74	65604	41%	59%
6	119	119450	66%	34%
7	158	885979	87%	13%
8	163	926451	90%	10%
9	164	916217	91%	9%
10	111	822822	61%	39%
11	151	638863	83%	17%
12	129	451817	71%	29%
Max	***164***	***5114015***	***91%***	***67%***

ZONE G		Total Permits		138
Month	**# licenses**	**Total pounds**	**% active**	**% latent**
1	100	143348	72%	28%
2	85	57093	62%	38%
3	67	35141	49%	51%
4	91	66756	66%	34%
5	102	159640	74%	26%
6	105	115001	76%	24%
7	112	338136	81%	19%
8	120	522089	87%	13%
9	124	579480	90%	10%
10	128	595091	93%	7%
11	126	674068	91%	9%
12	114	467597	83%	17%
Max	***128***	***3753439***	***93%***	***51%***

Table 4b. Summary of the total federal permit holders by zone (E – G) and how many of the permits are landing more than 100 pounds in a month. This results in a calculation of the number of active and latent permit holders, taking completely latent and seasonally latent permits into account when calculating the baseline amount of gear in each area.

Figures and Tables:

Trawl minimums

	3-12 miles	12+ miles
A	Triples	Triples
B	Triples	Triples
C	Triples	5's
D	Triples	5's
E	Triples	5's
F	8's	15's
G	Triples/8's	20's

% reduction in vertical lines

Month	A 12+	A 3-12	B 3-12	C 12+	C 3-12	D 12+	D 3-12	E 12+	E 3-12	F 12+	F 3-12	G 12+	G 3-12
Jan	13%	5%	15%	60%	22%	25%	14%	53%	14%	47%	6%	25%	16%
Feb	13%	5%	13%	60%	22%	21%	1%	45%	10%	25%	0%	32%	16%
March	15%	12%	18%	60%	24%	21%	2%	23%	11%	34%	0%	28%	22%
April	21%	18%	21%	60%	27%	50%	10%	23%	14%	26%	25%	-	22%
May	23%	15%	28%	-	26%	50%	17%	23%	10%	26%	25%	-	22%
June	25%	17%	30%	-	-	60%	27%	60%	0%	0%	33%	-	31%
July	29%	24%	33%	-	-	-	33%	60%	0%	0%	29%	-	32%
Aug	33%	28%	33%	-	-	-	-	60%	33%	0%	43%	-	32%
Sept	33%	22%	30%	-	-	60%	0%	60%	33%	0%	15%	-	0%
Oct	28%	18%	29%	-	24%	60%	9%	60%	17%	-	14%	-	29%
Nov	12%	17%	25%	-	21%	53%	20%	60%	17%	-	12%	-	26%
Dec	5%	14%	27%	60%	25%	51%	13%	47%	18%	49%	11%	-	25%
Avg	***18%***	***19%***	***26%***	***60%***	***23%***	***49%***	***14%***	***54%***	***15%***	***25%***	***18%***	***29%***	***23%***

Table 5. Examples of trawl minimums that could be implemented in the different Lobster Management Zones and distances from shore in Maine waters. The resulting reductions are the percentage of vertical lines that are removed from the baseline by the trawl minimums (moving trawls under that minimum to the next lowest possible trawl) by month. A zero percentage means that no reduction was achieved by the measure. The cells containing "-" indicate months in which gear was not reported to be fished in that area and month and therefore no risk reduction could be assessed.

Figures and Tables:

	Zone A	Reduction	# Lines	Zone B	Reduction	# Lines	Zone C	Reduction	# Lines	Zone D	Reduction	# Lines
Jan	62899	8%	57687	14123	15%	12012	71792	27%	52262	78820	16%	66331
Feb	49478	10%	44775	11192	13%	9705	58739	27%	42760	55148	5%	52247
March	44100	13%	38212	10699	18%	8826	5740	29%	4049	43203	6%	40825
April	15353	19%	12456	6903	21%	5469	11473	40%	6901	42036	20%	33658
May	44934	17%	37316	5344	28%	3871	4870	26%	3607	35487	25%	26617
June	36048	18%	29610	1977	30%	1379	-	-	-	6518	34%	4311
July	27259	24%	20626	4089	33%	2726	-	-	-	1579	33%	1053
Aug	31036	29%	22080	3061	33%	2041	-	-	-	-	-	-
Sept	39652	22%	30854	8436	30%	5916	-	-	-	3055	47%	1621
Oct	49543	18%	40446	18259	29%	13015	5516	24%	4208	9034	27%	6590
Nov	68920	14%	59304	26839	25%	20098	16965	21%	13392	37844	26%	28138
Dec	85476	11%	75684	21045	27%	15295	32525	28%	23257	62555	17%	51891

	Zone E	Reduction	# Lines	Zone F	Reduction	# Lines	Zone G	Reduction	# Lines	All Zones	Reduction	# Lines
Jan	32709	24%	24935	27223	7%	25206	22793	16%	19053	310360	16%	259841
Feb	21196	16%	17750	19802	17%	16522	17200	19%	13939	232756	15%	198008
March	16929	13%	14734	11106	14%	9573	17895	22%	13919	149671	16%	125233
April	9264	15%	7837	13855	25%	10404	15905	22%	12333	114790	22%	89949
May	5129	12%	4490	7774	25%	5837	5471	22%	4250	109009	21%	85837
June	3834	31%	2655	3722	29%	2650	3469	31%	2405	55567	24%	42259
July	3846	37%	2426	3983	26%	2936	2806	32%	1910	43562	27%	31619
Aug	3359	55%	1523	4817	39%	2932	3356	32%	2278	45630	33%	30672
Sept	5359	50%	2680	6716	14%	5769	6270	0%	6256	69489	22%	53926
Oct	10024	30%	7050	6068	14%	5207	10224	29%	7243	108668	23%	83411
Nov	19401	30%	13617	16875	12%	14790	15333	26%	11357	202177	23%	155513
Dec	23260	25%	17428	32426	16%	27115	26591	25%	19830	283877	20%	226120

Table 6. The number of lines in each Zone per month as the baseline density of vertical lines, the percentage reduction achieved in that area by the trawl length minimum discussed above, and the resulting number of lines remaining in each area by month as a result of those reductions. The cells containing "-" indicate months in which gear was not reported to be fished in that area and month and therefore no risk reduction could be assessed. The gray section is the baseline number of vertical lines, reduction and resulting vertical lines left in the system across all Zones in Maine.