

Table 12. Profile of TERSA Fishermen Compared to Other Keys Fishermen

	Alternative II		Preferred Alternative		Alternative IV		Alternative V	
	TERSA (%)	II	Alternative	Age	Alternative IV	Alternative V	Alternative IV	Alternative V
18-30	13.3	19.6	15.6	15.4	15.4	15.4	15.4	15.4
31-40	18.9	19.6	18.8	20.0	20.0	20.0	20.0	20.0
41-50	36.7	29.4	34.4	33.8	33.8	33.8	33.8	33.8
51-60	20.0	21.6	21.9	21.5	21.5	21.5	21.5	21.5
Over 60	11.1	9.8	9.4	9.2	9.2	9.2	9.2	9.2
Years of Fishing in Monroe								
Less than one year	1.1	2.0	1.6	1.5	1.5	1.5	1.5	1.5
1-5 years	6.7	9.8	7.8	7.7	7.7	7.7	7.7	7.7
6-10 years	12.4	13.7	12.5	12.3	12.3	12.3	12.3	12.3
11-20 years	16.9	19.6	17.2	18.5	18.5	18.5	18.5	18.5
21 or more years	62.9	54.9	60.9	60.0	60.0	60.0	60.0	60.0
Years of Fishing in TERSA								
1-5 years	10.1	9.8	10.9	10.8	10.8	10.8	10.8	10.8
6-10 years	25.8	25.5	20.3	21.5	21.5	21.5	21.5	21.5
11-20 years	16.9	17.6	17.2	18.5	18.5	18.5	18.5	18.5
21 or more years	47.2	47.1	51.6	49.2	49.2	49.2	49.2	49.2
Race/Ethnicity								
Anglo-American	76.7	74.5	78.1	78.5	78.5	78.5	78.5	78.5
Hispanic	21.1	25.5	20.3	20.0	20.0	20.0	20.0	20.0
African-American	2.2	0.0	1.6	1.5	1.5	1.5	1.5	1.5
Membership in Organizations								
Conch Coalition	7.0	3.9	3.1	3.1	3.1	3.1	3.1	3.1
OFF	12.0	9.8	7.8	7.7	7.7	7.7	7.7	7.7
MCCF	38.0	23.5	21.9	21.5	21.5	21.5	21.5	21.5
Environmental	2.0	3.9	4.7	4.6	4.6	4.6	4.6	4.6
Chambers of Commerce	303.0	2.0	4.7	4.6	4.6	4.6	4.6	4.6

Other Potential Costs and Mitigating Factors—Are the Potential Losses Likely?

In the above GIS-based analysis, the effects are referred to as “potential losses” or “maximum potential losses”. There is the possibility that there could be an additional cost not discussed but which cannot be quantified, that is, crowding and the resulting conflicts among users forced to compete in a smaller area. There are also several factors that could mitigate all the potential losses and further there is a possibility that there might not be any losses at all. It is quite possible that there might be actual net benefits to even the current displaced users. Below the issue of crowding costs and the mitigating factors and potential for beneficial outcomes are discussed in qualitative terms because it is not possible for us to quantify them. Two mitigating factors, how likely they might mitigate the potential losses from displacement, and how this might differ for each of the alternatives are discussed.

Crowding. As shown above, each of the alternatives would result in a certain amount of displacement. Displacement of commercial fishing activity is a certainty under all boundary alternatives, except Alternative I, the No-action Alternative. If this displacement results in the activity being transferred to other sites, there is a potential for crowding effects. Crowding effects could raise the costs of fishing, both private costs to each fishing operation and social costs in resolving conflicts.

Crowding conflicts were one of the issues mentioned when the State of Florida created the lobster trap certificate program which was designed to reduce the number of lobster traps. If fishing stocks outside the protected area are already fished to their limits (i.e., limits of sustainable harvests), then displacement could also lead to adverse stock effects and a lower level of catch from all commercial fisheries. Crowding effects would represent a potential cost not accounted for in our above GIS-based analysis and the potential for the existence of crowding effects would vary by alternative. Whether crowding effects are experienced would depend on the status of the fisheries outside the proposed protected area, the extent of displacement, the current knowledge and fishing patterns of the displaced fishermen, and other potential regulations. The trap reduction program is an example where crowding effects could be mitigated by making room for the displaced traps.

Relocation. If displaced commercial fishermen are simply able to relocate their fishing effort and they are able to partially or completely replace their lost catch by fishing elsewhere, then there might be less or no effect. However, the possibility exists that displacement, even if it does not result in lower overall catch, may result in higher costs. This would result in lower profits to fishing operations. Whether fishermen are able to relocate to other fishing sites and replace lost catch or avoid cost increases would depend, like with the issue of crowding, on the status of the fisheries outside the proposed protected area, the extent of the displacement, the current knowledge and fishing patterns of the displaced fishermen, and other potential regulations.

Long-term benefits from Replenishment Effects. Ecological reserves or marine reserves may have beneficial effects beyond the direct ecological protection from the sites themselves. That is, both the size and number of fish, lobster, and other invertebrates both inside and outside the reserves may increase i.e., the replenishment effect. The following quote from Davis 1998 summarizes the replenishment effect of reserves:

[W]e found 31 studies that tested whether protected areas had an effect on the size, reproductive output, diversity, and recruitment of fish in adjacent areas. Fisheries targeted species were two to 25 times more abundant in no-take areas than in surrounding areas for fish, crustaceans, and mollusks on coral and temperate reefs in Australia, New Zealand, the Philippines, Japan, Kenya, South Africa, the Mediterranean Sea, Venezuela, Chile, and the United States (California, Florida and Rhode Island). Mean sizes of fished species protected in no-take zones were 12 to 200% larger than those in surrounding areas for all fishes studied and in 75 to 78% of the invertebrates. Eighty-six percent of the studies that tested fishery yields found that catches within three kilometers of the marine protected areas were 46 to 50% higher than before no-take zones were created. It is clear that fishers all over the world believe no-take zones increase yields because they fish as close to the boundary as possible.

The long-term benefits from the reserve could offset any losses from displacement and may also result in long-term benefits and no costs (net benefits) to commercial fishermen that would be displaced by a proposed reserve. Again, this conclusion may vary by alternative.

Boundary Alternative II

Crowding and Relocation. For the lobster fishery, it appears that the lobster trap reduction program could fully mitigate the potential for crowding

costs. This boundary alternative would displace 2,228 traps. A ten percent reduction in traps in the TERSA would provide space for 3,690 traps. Further, lobster fishermen in the TERSA only catch 68% of their lobsters from the TERSA. Thus, lobster fishermen are knowledgeable about fishing in other areas of the Keys where they might move their displaced traps. Thus, under this boundary alternative there would be no crowding costs for lobsters and they would be able to replace catch from other areas. Thus, for lobsters, the potential economic losses identified in Table 11 are not likely to occur under Alternative II.

Crowding is not an issue for King mackerel because they are a pelagic species and thus move around and catching them elsewhere is highly likely without interfering with other fishermen. Shrimp fishermen currently only catch ten percent of their total shrimp catch from the TERSA. Displacement of shrimp catch under Boundary Alternative II would only be about one percent of their TERSA catch and less than one percent of their total shrimp catch. It would seem highly likely that there would be no crowding costs from displacement and given the small amounts of catch affected, it is highly likely that shrimp fishermen would be able to replace lost catch from other sites. However, some shrimp fishermen have said that they cannot replace lost catch from other sites. Thus, for King mackerel, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative II, but for shrimp the economic losses could range from zero to the maximum potential losses reported in Table 11.

Reef Fish fishermen comprise the largest group of TERSA fishermen. Under Boundary Alternative II, 37 of the sampled 42 fishermen would be affected. Reef fishermen are knowledgeable of other fishing locations outside the TERSA. In 1997, they caught 52% of their reef fish from areas in the Keys outside the TERSA. However, stocks of reef fish in the TERSA and throughout the Keys appear to be overfished. Alternative II displaces about 13% of the reef fish catch in the TERSA. Given the status of reef fish stocks, the losses identified in Table 11 are likely to occur in the short-term until the benefits of replenishment could off-set these losses in the longer-term.

Replenishment. No replenishment benefits to King mackerel or shrimp are expected. For lobsters and reef fish, replenishment benefits are expected. Davis (1998) provided an estimate that

invertebrates and reef fish at other marine reserves had shown increases in yields of 46–50% within three kilometers of the protected areas. Eight fish spawning areas have been identified in the western portion of the TERSA. Only one of the eight fish spawning areas is located within the Alternative II boundary and would be protected, and to thus support the replenishment effect. For lobsters, long-term net benefits to the commercial fishery of the TERSA are expected. For reef fish, it is not clear whether the full 13% lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses expected to be less than the 13% reductions that are the basis for the losses calculated and presented in Table 11.

Boundary Alternative III (Preferred Boundary Alternative)

Crowding and Relocation. For the lobster fishery, there is some potential for crowding costs. This boundary alternative would displace 4,346 traps. A ten percent reduction in traps in the TERSA would provide space for 3,690 traps. However, if the remaining 656 traps are relocated to zones 1–3 in the Keys, there would be more than adequate space given the 10% reduction in traps that took place in Monroe County between 1997–98 and 1998–99 (475,094 to 428, 411). See FMRI, 1998. Lobster fishermen in the TERSA only catch 68% of their lobsters from the TERSA. Thus, lobster fishermen are knowledgeable about fishing in other areas of the Keys where they might move their displaced traps. Thus, under this alternative their would be no crowding costs for lobsters and it is expected that they would be able to replace catch from other areas. Thus, for lobsters, the potential economic losses identified in Table 11 are not likely to occur under this alternative.

Crowding is not an issue for King mackerel because they are a pelagic species and thus move around and catching them elsewhere is highly likely without interfering with other fishermen. Shrimp fishermen currently only catch ten percent of their total shrimp catch from the TERSA. Displacement of shrimp catch under Boundary Alternative III (Preferred Boundary Alternative) would only be about eight percent of their TERSA catch and less than one percent of their total shrimp catch. It would seem highly likely that there would be no crowding costs from displacement and given the small amounts of catch affected, it is highly likely that shrimp fishermen would be able to replace lost catch from

other sites. However, some shrimp fishermen have said that they cannot replace lost catch from other sites. Thus, for King mackerel, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative III, but for shrimp the economic losses could range from zero to the maximum potential losses reported in Table 11.

Reef Fish fishermen comprise the largest group of TERSA fishermen. Under Boundary Alternative III (Preferred Boundary Alternative), 40 of the sampled 42 fishermen would be affected. Reef fishermen are knowledgeable of other fishing locations outside the TERSA. In 1997, they caught 52% of their reef fish from areas in the Keys outside the TERSA. However, stocks of reef fish in the TERSA and throughout the Keys appear to be overfished. Boundary Alternative III (Preferred Boundary Alternative) displaces 20% of the reef fish catch in the TERSA. Given the status of reef fish stocks, the losses identified in Table 11 are likely to occur in the short-term until the benefits of replenishment could offset these losses in the longer-term.

Replenishment. No replenishment benefits to King mackerel or shrimp are expected. For lobsters and reef fish, replenishment benefits are expected. Davis (1998) reports increases in yields of invertebrates and reef fish of 46–50% within three kilometers of the protected areas at other marine reserves. Five of the eight fish spawning areas identified in the western portion of the TERSA are located within the Alternative III boundary and would be protected, thus bolstering the replenishment effect. For lobsters, long-term net benefits would be expected under Boundary Alternative III (Preferred Boundary Alternative). For reef fish, it is not clear whether the full 20% lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses expected to be less than the 20% reductions that are the basis for the losses calculated and presented in Table 11.

Boundary Alternative IV

Crowding and Relocation. For the lobster fishery, there is some potential for crowding costs. It is estimated that this boundary alternative would displace 6,050 traps. A ten percent reduction in traps in the TERSA would provide space for 3,690 traps. However, if the remaining 2,360 traps are relocated to zones 1–3 in the Keys, there would be more than adequate space given the 10% reduction in traps that took place in Monroe County between

1997–98 and 1998–99 (475,094 to 428, 411). See FMRI, 1998. Lobster fishermen in the TERSA only catch 68% of their lobsters from the TERSA. Thus, lobster fishermen are knowledgeable about fishing in other areas of the Keys where they might move their displaced traps. Thus, under this alternative there would be no crowding costs for lobsters and fishermen would be able to replace catch from other areas. Thus, for lobsters, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative IV.

Crowding is not an issue for King mackerel because they are a pelagic species and thus move around and catching them elsewhere is highly likely without interfering with other fishermen. Shrimp fishermen currently only catch ten percent of their total shrimp catch from the TERSA. Displacement of shrimp catch under Boundary Alternative IV would only be about eight percent of their TERSA catch and less than one percent of their total shrimp catch. It would seem highly likely that there would be no crowding costs from displacement and given the small amounts of catch affected, it is highly likely that shrimp fishermen would be able to replace lost catch from other sites. However, some shrimp fishermen have said that they cannot replace lost catch from other sites. Thus, for King mackerel, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative IV, but for shrimp the economic losses could range from zero to the maximum potential losses reported in Table 11.

Reef fish fishermen comprise the largest group of TERSA fishermen. Under Boundary Alternative IV, all 42 of the sampled fishermen would be affected. Reef fishermen are knowledgeable of other fishing locations outside the TERSA. In 1997, they caught 52% of their reef fish from areas in the Keys outside the TERSA. However, stocks of reef fish in the TERSA and throughout the Keys appear to be overfished. Boundary Alternative IV displaces 28% of the reef fish catch in the TERSA. Given the status of reef fish stocks, the losses identified in Table 11 are likely to occur in the short-term until the benefits of replenishment could off-set these losses in the longer-term.

Replenishment. No replenishment benefits to King mackerel or shrimp are expected. For lobsters and reef fish, replenishment benefits are expected. Davis (1998) reports increases in yields of invertebrates and reef fish of 46–50% within three kilometers of the protected areas at other marine reserves. Seven of

the eight fish spawning areas identified in the western portion of the TERSA are located within the Alternative IV boundary and would be protected, thus bolstering the replenishment effect. For lobsters, long-term net benefits to the commercial fishery of the TERSA are expected. For reef fish, it is not clear whether the full 28% lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses expected to be less than the 28% reductions that are the basis for the losses calculated and presented in Table 11.

Boundary Alternative V

Crowding and Relocation. For the lobster fishery, there is some potential for crowding costs. This boundary alternative would displace 6,487 traps. A ten percent reduction in traps in the TERSA would provide space for 3,690 traps. However, if the remaining 2,797 traps are relocated to zones 1–3 in the Keys, there would be more than adequate space given the 10% reduction in traps that took place in Monroe County between 1997–98 and 1998–99 (475,094 to 428,411). See FMRI, 1998. Lobster fishermen in the TERSA only catch 68% of their lobsters from the TERSA and they are knowledgeable about fishing in other areas of the Keys where they might move their displaced traps. Thus, under this boundary alternative there would be no crowding costs for lobsters and fishermen would be able to replace catch from other areas. Therefore, for lobsters, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative V.

Crowding is not an issue for King mackerel because they are a pelagic species and thus move around and catching them elsewhere is highly likely without interfering with other fishermen. Shrimp fishermen currently only catch ten percent of their total shrimp catch from the TERSA. Displacement of shrimp catch under Boundary Alternative V would only be about ten percent of their TERSA catch and about one percent of their total shrimp catch. It would seem highly likely that there would be no crowding costs from displacement and given the small amounts of catch affected, it is highly likely that shrimp fishermen would be able to replace lost catch from other sites. However, some shrimp fishermen have said that they cannot replace lost catch from other sites. Thus, for King mackerel, the potential economic losses identified in Table 11 are not likely to occur under Boundary Alternative V, but for shrimp the

economic losses could range from zero to the maximum potential losses reported in Table 11.

Reef fish fishermen comprise the largest group of TERSA fishermen. Of the 90 TERSA fishermen sampled, 42 were reef fish fishermen. Under Boundary Alternative V, all 42 would be affected. Reef fishermen are knowledgeable of other fishing locations outside the TERSA. In 1997, they caught 52% of their reef fish from areas in the Keys outside the TERSA. However, stocks of reef fish in the TERSA and throughout the Keys appear to be overfished. Boundary Alternative V displaces 29% of the reef fish catch in the TERSA. Given the status of reef fish stocks, the losses identified in Table 11 are likely to occur in the short-term until the benefits of replenishment could off-set these losses in the longer-term.

Replenishment. No replenishment benefits to King mackerel or shrimp are expected. For lobsters and reef fish, replenishment benefits are expected. Davis (1998) reports increases in yields of invertebrates and reef fish of 46–50% within three kilometers of the protected areas at other marine reserves. Seven of the eight spawning areas identified in the western portion of the TERSA are located within the Alternative V boundary and would be protected, thus bolstering the replenishment effect. For lobsters, long-term net benefits under Alternative V are expected. For reef fish, it is not clear whether the full 29% lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses expected to be less than the 29% reductions that are the basis for the losses calculated and presented in Table 11.

Commercial Shipping

No effect for any of the alternatives.

Treasure Salvors

No expected effect for any of the alternatives. One permit for inventorying submerged cultural resources in Sanctuary waters was issued for the Tortugas area of the Sanctuary. There were no submerged cultural resources found on the Tortugas Bank. Whether there are any submerged cultural resources on Riley's Hump is unknown.

Other Potential Benefits

In both the recreation industry (fishing and diving) and the commercial fishery sections above, the potential benefits to recreational and commercial fisheries from the replenishment effect of an ecological reserve were discussed.

Also discussed in the recreation industry section were the potential benefits to non-consumptive recreational users (divers). Below, some of the most important benefits of an ecological reserve—scientific values, and education values—are discussed.

Ecological reserves provide a multitude of environmental benefits. Sobel (1996) provides a long list of these benefits. Most of those benefits have been described above. Sobel (1996) categorizes scientific and education values into those things a reserve provides that increase knowledge and understanding of marine systems. Sobel provides the following lists of benefits:

Scientific Values:

- Provides long-term monitoring sites
- Provides focus for study
- Provides continuity of knowledge in undisturbed site
- Provides opportunity to restore or maintain natural behaviors
- Reduces risks to long-term experiments
- Provides controlled natural areas for assessing anthropogenic impacts, including fishing and other impacts

Education Values:

- Provides sites for enhanced primary and adult education
- Provides sites for high-level graduate education

Other Regulations

Each of the four regulatory alternatives (A–D) are analyzed for each boundary alternative (I–V).

Boundary Alternative I

This is the No-Action Alternative and would not result in the expansion of the Sanctuary boundary and would not establish a Tortugas Ecological Reserve. None of the regulatory alternatives would apply.

Boundary Alternative II

This alternative limits the reserve to the existing Sanctuary boundary for a total area of approximately 55 nm². (Figure 1). This alternative includes a portion of Sherwood Forest and the coral pinnacles north of Tortugas Bank; it does not include Riley's Hump. It includes some coral and hardbottom habitat north of the DRTO. Tortugas South would not exist under Boundary Alternative II. None of the regulatory alternatives would apply to the Tortugas South area.

Regulatory Alternative A: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South. The Sanctuary-wide regulations already

apply to Tortugas North and the effects of the ecological reserve regulations have been analyzed under the no-take discussion above. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative B: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The Sanctuary-wide regulations already apply to Tortugas North and the effects of the ecological reserve regulations have been analyzed under the no-take discussion above. The existing ecological reserve regulations would prohibit fishing in the Tortugas Ecological Reserve consistent with 15 CFR 922.164(d) Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative C: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas North and South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B). The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The Sanctuary-wide regulations already apply to Tortugas North and the effects of the ecological reserve regulations have been analyzed under the no-take discussion above. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

This regulatory alternative has no incremental impact on commercial fishing or recreational consumptive users since they are displaced by the "no-take" regulation. The dive operator servicing non-consumptive diving and currently operating in Tortugas North would be prohibited from anchoring. His vessel is less than 100 ft LOA and thus he would be unaffected by the prohibition on mooring. The location and availability of mooring buoys would constrain the number and choice of available dive sites. Whether this would have any impact on the future business volume of dive operators or the quality of the experience to non-consumptive divers is unknown. The extent of impact would be dependent on the number and locations of mooring buoys (to be determined).

This regulatory alternative would have little impact on commercial shipping because continuous transit would be allowed. Vessels 50m or greater in registered length are already prohibited from anchoring in 19.3% of Tortugas North. The main effect would be to ban such vessels from anchoring on the remainder of Tortugas North. There would be no incremental impact to treasure salvors since they would be displaced by the "no-take" regulation. The one dive operator servicing non-consumptive diving and currently operating in Tortugas North would be required to obtain Tortugas access permits. Any new dive operators would also be required to obtain permits. There would be minor time costs associated with obtaining a permit for calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out will not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit.

Regulatory Alternative D (Preferred Regulatory Alternative): Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); prohibit anchoring in and control access to Tortugas North via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B); and prohibit anchoring and restrict access to Tortugas South, other than for continuous transit or law enforcement purposes, to research or education activities only pursuant to a sanctuary permit. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are

included in Appendix C to the FSEIS/SMP. The impacts of this regulatory alternative for this boundary alternative are the same as those described for Regulatory Alternative C, above. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Boundary Alternative III (Preferred Boundary Alternative)

This alternative would expand the boundary of the Sanctuary and its westernmost corner by approximately 36 nm² to include Sherwood Forest. In addition, this alternative would expand the boundary by adding a non-contiguous area of approximately 60 nm² to include Riley's Hump. The Reserve would also incorporate approximately 55 nm² of the existing Sanctuary in its northern section, for a total area of approximately 151 nm². The area of the Reserve surrounding Sherwood Forest would be called Tortugas North and encompass approximately 91 nm²; the area surrounding Riley's Hump would be called Tortugas South and encompass approximately 60 nm². A small portion of Tortugas North and all of Tortugas South would be outside the existing Sanctuary boundary. (Figure 1).

Regulatory Alternative A: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South. Boundary Alternative III includes areas currently outside the Sanctuary boundary. The Sanctuary-wide regulations would become effective in the expansion areas of Tortugas North and South. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The effects of the ecological reserve regulations have been analyzed under the no-take discussion above. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative B: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy. The Sanctuary-

wide regulations would become effective in the expansion areas of Tortugas North and South. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

The effects of the ecological reserve regulations have been analyzed under the no-take discussion above. The prohibition on anchoring would have no incremental impact on commercial fishing or recreational consumptive users since they are displaced by the "no-take" regulation. The one dive operator servicing non-consumptive diving and currently operating in Tortugas North would be prohibited from anchoring. There are no known recreational dive operators servicing Tortugas South. The location and availability of mooring buoys would constrain the number and choice of available dive sites. Whether this would have any impact on the future business volume of dive operators or the quality of the experience to non-consumptive divers is unknown. The extent of impact would be dependent on the number and locations of mooring buoys (to be determined). The prohibition on anchoring would impact commercial shipping in the boundary expansion areas, especially in Tortugas South. The prohibition on anchoring in Tortugas North is discussed under Boundary/Regulatory Alternative IIC above. Anchoring by large commercial vessels is known to occur in Tortugas South on Riley's Hump. The impact of this regulation on commercial vessel operators is expected to be small since other anchorages are available a short distance outside the Sanctuary boundary.

There would be no incremental impact on treasure salvors from the no-anchoring prohibition since they would be displaced by the "no-take" regulation. The permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations. There are no known non-consumptive dive operators currently operating in Tortugas South. Any non-consumptive dive operators operating in Tortugas South in the future would be required to obtain Tortugas access permits. It is not possible to gauge the extent of any such future activity. There would be minor time costs associated with obtaining a permit and calling-in

and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit.

Regulatory Alternative C: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas North and South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B). The only difference between the impacts of this regulatory alternative from those discussed under Regulatory Alternative B would be those associated with the requirement to obtain a permit for other than continuous transit access to Tortugas North. The permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations. There is only one known non-consumptive dive operator currently operating in Tortugas North. He and any new non-consumptive dive operators operating in Tortugas North would be required to obtain Tortugas access permits. There would be minor time costs associated with obtaining a permit and calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative D (Preferred Regulatory Alternative): Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); prohibit anchoring in and control access to Tortugas North via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B); and prohibit anchoring and restrict

access to Tortugas South, other than for continuous transit or law enforcement purposes, to research or education activities only pursuant to a sanctuary permit. The only difference between the impacts of this regulatory alternative from those discussed under Regulatory Alternative C would be those associated with limiting noncontinuous transit access to Tortugas South to research/educational purposes. For the commercial fisheries, salvors, and recreational consumptive users, there would be no incremental impacts since the "no-take" regulation would displace these user groups. There are no known non-consumptive dive operators currently operating in Tortugas South and no recreational diving is known to occur there. Under this alternative, none would be allowed in the future. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Boundary Alternative IV

Over Boundary Alternative III, this alternative would expand Tortugas North to the south by 23 nm² to be conterminous with the NPS's proposed Research/Natural Area within the DRTO. The total area of the Reserve would be approximately 175 nm². It also involves the same boundary expansion as Boundary Alternative III. A small portion of Tortugas North and all of Tortugas South would be outside the existing Sanctuary boundary. (Figure 1).

Regulatory Alternative A: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South. The Sanctuary-wide regulations would become effective in the expansion areas of Tortugas North and South. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/FSMP. The effects of the ecological reserve regulations which, under Boundary Alternative IV would apply to a larger area because of the southern expansion of Tortugas North, have been analyzed under the no-take discussion above. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative B: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy. The Sanctuary-wide regulations would become effective in the expansion areas of Tortugas North and South. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/FMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

The effects of the ecological reserve regulations which under Boundary Alternative IV would apply to a larger area because of the southern expansion of Tortugas North have been analyzed under the no-take discussion above. The prohibition on anchoring would have no incremental impact on commercial fishing or recreational consumptive users since they are displaced by the "no-take" regulation. There are no known recreational dive operators servicing Tortugas South. The location and availability of mooring buoys would constrain the number and choice of available dive sites. Whether this would have any impact on the future business volume of dive operators or the quality of the experience to non-consumptive divers is unknown. The extent of impact would be dependent on the number and locations of mooring buoys (to be determined).

The prohibition on anchoring would impact commercial shipping in the boundary expansion areas, especially in Tortugas South. The prohibition on anchoring in Tortugas North is discussed under Boundary/Regulatory Alternative IIC above. Anchoring by large commercial vessels is known to occur in Tortugas South on Riley's Hump. The impact of this regulation on commercial vessel operators is expected to be small since other non-coral reef anchorages outside the Sanctuary boundary are available a short distance away.

There would be no incremental impact on treasure salvors from the no-anchoring prohibition since they would be displaced by the "no-take" regulation.

The permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations. There are no known non-consumptive dive operators currently operating in Tortugas South. Any non-consumptive dive operators operating in Tortugas South in the future would be required to obtain Tortugas access permits. It is not possible to gauge the extent of any such future activity. There would be minor time costs associated with obtaining a permit and calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit.

Regulatory Alternative C: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas North and South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B). The only difference between the impacts of this regulatory alternative from those discussed under Alternative B would be those associated with the requirement to obtain a permit for other than continuous transit access to Tortugas North. Under this boundary alternative there are 2.75 more person-days of recreational non-consumptive use than under Boundary Alternatives II and III. While the area of Tortugas North would be increased by the expansion to the south, the permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations. There is only one known non-consumptive dive operator currently operating in Tortugas North. He and any new non-consumptive dive operators operating in Tortugas North would be required to obtain Tortugas access permits. There would be minor time costs associated with obtaining a permit and calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed ten minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit. The existing and proposed Sanctuary

regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative D (Preferred Regulatory Alternative): Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); prohibit anchoring in and control access to Tortugas North via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B); and prohibit anchoring and restrict access to Tortugas South, other than for continuous transit or law enforcement purposes, to research or education activities only pursuant to a sanctuary permit. The only difference between the impacts of this regulatory alternative from those discussed under regulatory Alternative C would be those associated with limiting non-continuous transit access to Tortugas South to research/educational purposes. For the commercial fisheries, salvors, and recreational consumptive users, there would be no incremental impacts since the "no-take" regulation would displace these user groups. There are no known non-consumptive dive operators currently operating in Tortugas South and no recreational diving is known to occur there. Under this alternative, none would be allowed in the future. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Boundary Alternative V

Over Boundary Alternative III, this alternative would expand the Sanctuary boundary to the west by three minutes ending at longitude 83°09' instead of 83°06' and would increase the reserve area to 190 nm². Tortugas North would be expanded to the west and Tortugas South would be shortened to the north. A small portion of Tortugas North and all of Tortugas South would be outside the existing Sanctuary boundary. (Figure 1).

Regulatory Alternative A: Apply existing Sanctuary-wide and existing ecological reserve regulations to

Tortugas North and South. The Sanctuary-wide regulations would become effective in the expansion area. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/FSMP. The effects of the ecological reserve regulations which, under Boundary Alternative V apply to a larger area because of the Sanctuary expansion, have been analyzed under the no-take discussion above. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative B: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy. The Sanctuary-wide regulations would become effective in the expansion area. The existing and proposed Sanctuary regulations and their impacts are summarized in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/FSMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

The effects of the ecological reserve regulations which, under Boundary Alternative V would apply to a larger area because of the Sanctuary expansion, have been analyzed under the no-take discussion above. The prohibition on anchoring would have no incremental impact on commercial fishing or recreational consumptive users since they are displaced by the "no-take" regulation. There are no known recreational dive operators servicing Tortugas South. The location and availability of mooring buoys would constrain the number and choice of available dive sites. Whether this would have any impact on the future business volume of dive operators or the quality of the experience to non-consumptive divers is unknown. The extent of impact would be dependent on the number and locations of mooring buoys (to be determined).

The prohibition on anchoring would impact commercial shipping in the boundary expansion area, especially in

Tortugas South. Anchoring by large commercial vessels is known to occur in Tortugas South on Riley's Hump. The impact of this prohibition on commercial vessel operators would be small since other non-coral reef anchorages are available a short distance away outside the Sanctuary boundary.

There would be no incremental impact on treasure salvors from the no-anchoring prohibition since they would be displaced by the "no-take" regulation.

The permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations.

There are no known non-consumptive dive operators currently operating in Tortugas South. Any non-consumptive dive operators operating in Tortugas South in the future would be required to obtain Tortugas access permits. It is not possible to gauge the extent of any such future activity. There would be minor time costs associated with obtaining a permit and calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit.

Regulatory Alternative C: Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); and prohibit anchoring in and control access to Tortugas North and South, other than for continuous transit or law enforcement purposes, via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B). The only difference between the impacts of this regulatory alternative from those discussed under Regulatory Alternative B would be those associated with the requirement to obtain a permit for other than continuous transit access to Tortugas North. Under this boundary alternative there are 3.25 more person-days of recreational non-consumptive use than under Boundary Alternatives IV. While the area of Tortugas North would be increased by the expansion to the west, the permit requirements would have no incremental impact on fishermen or salvors because they would be displaced by the "no-take" regulations. There is one known non-consumptive dive operator currently operating in Tortugas North. He and any new non-consumptive dive operators operating in Tortugas North would be

required to obtain Tortugas access permits. There would be minor time costs associated with obtaining a permit and calling-in and calling-out to access the reserve. It is expected that fulfilling all the permit requirements and calling-in and calling-out would not exceed 10 minutes of each permittee's time for each visit to the reserve. No special professional skills would be necessary to apply for a permit. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

Regulatory Alternative D (Preferred Regulatory Alternative): Apply existing Sanctuary-wide and existing ecological reserve regulations to Tortugas North and South (as described in Regulatory Alternative A); prohibit anchoring in and control access to Tortugas North via permit, require call-in for entering and leaving, and prohibit vessels longer than 100 ft LOA from using a mooring buoy (as described in Regulatory Alternative B); and prohibit anchoring and restrict access to Tortugas South, other than for continuous transit or law enforcement purposes, to research or education activities only pursuant to a sanctuary permit. The only difference between the impacts of this regulatory alternative from those discussed under Regulatory Alternative C would be those associated with limiting noncontinuous transit access to Tortugas South to research/educational purposes. For the commercial fisheries, salvors, and recreational consumptive users, there would be no incremental impacts since the "no-take" regulation would displace these user groups. There are no known non-consumptive dive operators currently operating in Tortugas South and no recreational diving is known to occur there. Under this alternative, none would be allowed in the future. The existing and proposed Sanctuary regulations and their impacts are presented in Table 13. More detailed descriptions of the regulations are included in Appendix C to the FSEIS/SMP. The existing ecological reserve regulations would prohibit fishing in the Reserve consistent with 15 CFR 922.164(d), Ecological Reserves and Sanctuary Preservation Areas.

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Table 13. Impacts on Small Businesses

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive Boundary Alternative II	Commercial Shipping	Treasure Salvors
I. No Take					
(a) Possessing, moving, harvesting, removing, taking, damaging, disturbing, breaking, cutting, spearing, or otherwise injuring any coral, marine invertebrate, fish, bottom formation, algae, seagrass or other living or dead organism, including shells, or attempting any of these activities. However, fish, invertebrates, and marine plants may be possessed aboard a vessel in the ecological reserve provided such resources can be shown not to have been harvested within, removed from, or taken within, the ecological reserve, as applicable, by being stowed in a cabin, locker, or similar storage area prior to entering and during transit through	<p>A. Maximum Potential Loss</p> <p>51 of the 105 to 110 commercial fishing operations are potentially impacted. Some operations are multi-species fisheries. 24 lobster, 6 shrimp, 15 king mackerel, and 37 reef fish operations potentially impacted directly. About \$411 thousand in harvest revenue potentially lost or 6 % of the harvest revenue from the TERSA. On average, about \$8,000 per fishing operation. Additionally, potential losses to 10 fish houses and other small businesses through the multiplier impact.</p>	<p>A. Maximum Potential Loss</p> <p>9 of 12 charter boat operations operating within the TERSA would be potentially impacted. Direct business revenue would include 26.6% for diving for lobsters, 20% for spear fishing, and 2.9% for fishing. Across all three recreation consumptive activities, 9.48% of revenue would be potentially impacted and about 14% of profits. On average, maximum potential losses are estimated to be about \$13,700 of lost revenue and \$5,580 of lost profits per operation. Additional potential losses to an unknown number of small firms through the multiplier</p>	<p>A. Maximum Potential Loss</p> <p>No losses. Potential gains to one charter boat dive operation providing services to non-consumptive divers. Indirect gains to several small businesses due to the multiplier impacts. Gains from improvements in quality of sites in terms of diversity, number and size of various sea life. Improvements in quality of experience leading to increase in demand for charter boat services and corresponding multiplier impacts on other small businesses.</p>	<p>A. Maximum Potential Loss</p> <p>No impact.</p> <p>B. Mitigating Factors, Offsetting Factors and Net Impact</p> <p>No impact.</p>	<p>A. Maximum Potential Loss</p> <p>No expected impact. One permit for inventorying submerged cultural resources in Sanctuary waters was issued for the Tortugas area of the Sanctuary. There were no submerged cultural resources found.</p> <p>B. Mitigating Factors, Offsetting Factors and Net Impact</p> <p>No mitigating factors or offsetting factors. Sanctuary will not issue permits for treasure salvaging in the ecological reserve. Since no submerged cultural resources were located on Tortugas Bank, no expected impact.</p>

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted		
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive
	Boundary Alternative II (continued)		
I. No Take (continued)			
such reserve, provided further that such vessel is in continuous transit through the ecological reserve.			
(b) Fishing by any means.			
(c) Touching living or dead coral, including but not limited to, standing on a living or dead coral formation.			
	B. Mitigating Factors, Off-setting Factors and Net Impact		
	Relocation. For lobster fishing operations, the potential losses are not likely to occur because the State of Florida's trap reduction program and fishermen are knowledgeable of other fishing locations throughout the Sanctuary. For king mackerel operations, potential losses are not likely to occur because king mackerel is a pelagic species that is highly mobile and could be caught in other locations. For shrimp operations, losses are not likely to occur because shrimp caught in the proposed reserve are such a small percentage of total catch.	impacts. Only a fraction of a percent of the total tourist/recreation business in Monroe County.	
		B. Mitigating Factors, Off-setting Factors and Net Impact	
		Substitution. Complete mitigation with no losses is a high probability because only a small portion of the Tortugas Bank is included in the ecological reserve. All users can substitute to other sites on the southern half of Tortugas Bank. Long-term Benefits from Replenishment Effect. Net result is no short term losses and long-term gains to small businesses that are directly and indirectly dependent on recreational	
			Treasure Salvors

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping
1. No Take (continued)	Boundary Alternative II (continued)			
	<p>For reef fish, the potential losses are likely to occur in the short term because reef fish stocks are overfished throughout the Sanctuary.</p> <p>Long-term Benefits from Replenishment. No expected benefits to king mackerel or shrimp operations. For lobster operations, expected net benefits from replenishment effect of ecological reserve. For reef fish operations, it is not clear whether the full 13 percent lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses to be less than the 13 percent reduction in the maximum loss case.</p>			

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
Boundary Alternative II (continued)					
2. No Anchoring/Required Mooring Buoy Use/No Discharges or Deposits					
(a) Anchoring on coral.	No incremental impact since "no take" regulations already displace all commercial fishing.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	One charter operation that currently operates in Tortugas North potentially impacted. Mooring buoy use will constrain number and choice of available dive sites. It is unknown whether this will impact on future business of dive operators. Impact is dependent on the number and distribution (locations) of mooring buoys (to be determined). Prohibition against discharges or deposits will result in no incremental impact.	No impact.	No incremental impact since treasure salvaging displaced by "no take" regulations.
(b) Anchoring when mooring buoys or designated anchoring areas are available					
(c) Discharges or deposits except cooling water or engine exhaust.					
3. No Access					
Alternative A: Apply existing ecological reserve regulations to Tortugas North and South.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued)					
<p>Alternative B: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas South via permit and require call-in, call-out. Use of mooring buoys by vessels 100' or less in length.</p> <p>Alternative C: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas North and South via permit and require call-in, call-out (as described in Alternative B). Use of mooring buoys by vessels 100' or less in length.</p>	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No incremental impact. See regulations 1 and 2 above. Tortugas South not in this boundary alternative.	No impact.	No incremental impact since "no take" regulations displaces treasure salvaging.
	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Currently one charter dive operator operates in Tortugas North, while none operate in the South. Minor amount of time cost to charter operations in reporting to Sanctuary staffer to obtain permit and to notify when entering a leaving ecological reserve. None of the current operators have vessels over 100 feet in length. Time costs expected to be limited to less than 15 minutes to obtain permit and access operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued)					
Alternative D (Preferred): Apply existing ecological reserve regulations to Tortugas North and Tortugas South (as described in Alternative A). Prohibit anchoring in Tortugas North and South and control access to Tortugas North via permit and require call-in, call-out (as described in Alternative B). Restrict access to Tortugas South to research or educational activities only. Use of mooring buoys by vessels 100' or less in length.	No incremental impact since commercial fishing is already displaced by "no take" regulations.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	Currently one dive operator operates in Tortugas North, none in Tortugas South. Minor time costs to dive charter operators in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve. Time cost is expected to be less than 15 minutes per operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
	A. Maximum Potential Loss	A. Maximum Potential Loss	A. Maximum Potential Loss	A. Maximum Potential Loss
1. No Take				
(a) Possessing, moving, harvesting, removing, taking, damaging, disturbing, breaking, cutting, spearing, or otherwise injuring any coral, marine invertebrate, fish, bottom formation, algae, seagrass or other living or dead organism, including shells, or attempting any of these activities. However, fish, invertebrates, and marine plants may be possessed aboard a vessel in the ecological reserve provided such resources can be shown not to have been harvested within, removed from, or taken within, the ecological reserve, as applicable, by being stowed in a cabin, locker, or similar storage area prior to entering and during transit through	64 of the 105 to 110 commercial fishing operations are potentially impacted. Some operations are multi-species fisheries. 27 lobster, 15 shrimp, 16 king mackerel, and 40 reef fish operations potentially impacted directly. About \$844 thousand in harvest revenue potentially lost or 12 % of the harvest revenue from the TERSA. On average, about \$13,000 per fishing operation. Additionally, potential losses to 10 fish houses and other small businesses through the multiplier impact.	9 of 12 charter boat operations operating within the TERSA would be potentially impacted. Direct business revenue would include 26.6% for diving for lobsters, 20% for spear fishing, and 6.3% for fishing. Across all three recreation consumptive activities, 11.7% of revenue would be potentially impacted and almost 16% of profits. On average, maximum potential losses are estimated to be about \$13,700 of lost revenue and \$5,580 of lost profits per operation. Additional potential losses to an unknown number of small firms through the multiplier impacts. Only a fraction	No losses. Potential gains to one charter boat dive operation providing services to non-consumptive divers. Indirect gains to several small businesses due to the multiplier impacts. Gains from improvements in quality of sites in terms of diversity, number and size of various sea life. Improvements in quality of experience leading to increase in demand for charter boat services and corresponding multiplier impacts on other small businesses.	No impact.
				B. Mitigating Factors, Off-setting Factors and Net Impact
				No expected impact. One permit for inventorying submerged cultural resources in Sanctuary waters was issued for the Tortugas area of the Sanctuary. There were no submerged cultural resources found.
				B. Mitigating Factors, Off-setting Factors and Net Impact
				No mitigating factors or offsetting factors. Sanctuary will not issue permits for treasure salvaging in the ecological reserve. Since no submerged cultural resources were located on Tortugas Bank, no expected impact.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
<p>1. No Take (continued) such reserve, provided further that such vessel is in continuous transit through the ecological reserve.</p> <p>(b) Fishing by any means.</p> <p>(c) Touching living or dead coral, including but not limited to, standing on a living or dead coral formation.</p>	<p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>Relocation. For lobster fishing operations, the potential losses are not likely to occur because the State of Florida's trap reduction program and fishermen are knowledgeable of other fishing locations throughout the Sanctuary. For king mackerel operations, potential losses are not likely to occur because king mackerel is a pelagic species that is highly mobile and could be caught in other locations. For shrimp operations, losses are not likely to occur because shrimp caught in the proposed reserve are such a small percentage of total catch.</p>	<p>of a percent of the total tourist/recreation business in Monroe County.</p> <p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>Substitution. Complete mitigation with no losses is a high probability because only a small portion of the Tortugas Bank is included in the ecological reserve. All users can substitute to other sites on the southern half of Tortugas Bank.</p> <p>Long-term Benefits from Replenishment Effect. Net result is no short term losses and long-term gains to small businesses that are directly and indirectly dependent on</p>	<p>Boundary Alternative III: Preferred (continued)</p>	

Table 13. Impacts on Small Businesses (continued)

Industries Impacted					
Regulation	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
1. No Take (continued)					
	<p>For reef fish, the potential losses are likely to occur in the short term because reef fish stocks are overfished throughout the Sanctuary.</p> <p>Long-term Benefits from Replenishment. No expected benefits to king mackerel or shrimp operations. For lobster operations, expected net benefits from replenishment effect of ecological reserve. For reef fish operations, it is not clear whether the full 20 percent lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses to be less than the 20 percent reduction in the maximum loss case.</p>	<p>recreational consumptive use in the TERSA.</p>			

Boundary Alternative III: Preferred (continued)

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
Boundary Alternative III: Preferred (continued)				
2. No Anchoring/Required Mooring Buoy Use/No Discharges or Deposits.				
(a) Anchoring on coral.	No incremental impact since "no take" regulations already displace all commercial fishing.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	One charter operation that currently operates in Tortugas North potentially impacted. Mooring buoy use will constrain number and choice of available dive sites. It is unknown whether this will impact on future business of dive operators. Impact is dependent on the number and distribution (locations) of mooring buoys (to be determined). Prohibition against discharges or deposits results in no incremental impact.	No incremental impact since treasure salvaging displaced by "no take" regulations.
(b) Anchoring when mooring buoys or designated anchoring areas are available				
(c) Discharges or deposits except cooling water or engine exhaust.				
3. No Access				
Alternative A: Apply existing ecological reserve regulations to Tortugas North and South.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued)					
Boundary Alternative III: Preferred (continued)					
Alternative B: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas South via permit and require call-in, call-out. Use of mooring buoys by vessels 100' or less in length.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.
Alternative C: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas North and South via permit and require call-in, call-out (as described in Alternative B). Use of mooring buoys by vessels 100' or less in length.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Currently one charter dive operator operate in Tortugas North, while none operate in the South. Minor amount of time cost to charter operations in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve. permission. None of the current operators have vessels over 100 feet in length. Time costs expected to be limited to less than 15 minutes to obtain permit and access operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued)					
Alternative D (Preferred): Apply existing ecological reserve regulations to Tortugas North and Tortugas South (as described in Alternative A). Prohibit anchoring in Tortugas North and South and control access to Tortugas North via permit and require call-in, call-out (as described in Alternative B). Restrict access to Tortugas South to research or educational activities only. Use of mooring buoys by vessels 100' or less in length.	No incremental impact since commercial fishing is already displaced by "no take" regulations.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	Currently one dive operator operates in Tortugas North, none in Tortugas South. Minor time costs to dive charter operators in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve. Time cost is expected to be less than 15 minutes per operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations					
Prohibited Activities					
a. Mineral and hydrocarbon exploration, development and production.	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
b. Removal of, injury to, or possession of coral or live rock.	No impact because the commercial and personal taking of coral and live rock is currently illegal. Live rock aquaculture permits will not be issued and none are currently in existence.	No impact because the commercial and personal taking of coral and live rock is currently illegal.	Not applicable.	Not applicable.	Not applicable.
c. Alteration of, or construction on the seabed (exemptions are made for installation of navigation aids & mooring buoys).	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
d. Discharge or deposit of materials or other matter except cooling water or engine exhaust.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
e. Operation of vessels that strike or injure coral or seagrass; anchoring on live coral in depths less than 40'; exceeding 4 knots or creating wakes in designated areas; injuring or taking birds or marine mammals.	No incremental impact because commercial fishing already displaced by "no take" regulations.	No incremental impacts because recreational consumptive users already displaced by "no take" regulations.	No impact expected because dive operators already operate in this manner. No firms currently operate in these areas.	No impact.	No incremental impact since "no take" regulation displaces treasure salvaging.
f. Conduct of diving/snorkeling without a dive flag.	Not applicable.	No incremental impact because recreational consumptive users are already displaced by "no take" regulation.	No impact expected because use of flags is already required by other Federal and State regulations. No firms currently operate in these areas.	Not applicable.	Not applicable.
g. Release of exotic species.	No impact because release of exotic species is already prohibited by other laws and there are no known aquaculture operations in the areas.	No impact because release of exotic species is already prohibited by other laws.	No impact because release of exotic species is already prohibited by other laws.	No impact because release of exotic species is already prohibited by other laws.	No incremental impact since "no take" regulation displaces treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
h. Damage or removal of markers.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers. No firms currently operate in these areas.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers.	No incremental impact since "no take" regulation displaces treasure salvaging.
i. Movement of, removal of, injury to, or possession of Sanctuary historical resources.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	No incremental impact since "no take" regulations displace treasure salvaging.
j. Take or possession of protected wildlife.	No impact because wildlife is already protected by other applicable law.	No impact because wildlife is already protected by other applicable law.	Not applicable.	Not applicable.	Not applicable.
k. Possession or use of explosives or electrical discharges (intent is to apply to take of marine species).	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.	Not applicable.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
l. Harvest or possession of marine life species (effect is to extend current State law into Federal waters).	No incremental impact because commercial fishing is already displaced by "no take" regulations. Currently there are no marine life collectors operating in these areas.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.	Not applicable.
m. Interference with law enforcement.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No impact expected because this provision is consistent with existing laws providing for penalties for interfering with law enforcement. No firms currently operate in these areas.	No impact expected because this provision is consistent with existing laws providing for penalties for interfering with law enforcement.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive Boundary Alternative IV	Commercial Shipping	Treasure Salvors
1. No Take					
(a) Possessing, moving, harvesting, removing, taking, damaging, disturbing, breaking, cutting, spearing, or otherwise injuring any coral, marine invertebrate, fish, bottom formation, algae, seagrass or other living or dead organism, including shells, or attempting any of these activities. However, fish, invertebrates, and marine plants may be possessed aboard a vessel in the ecological reserve provided such resources can be shown not to have been harvested within, removed from, or taken within, the ecological reserve, as applicable, by being stowed in a cabin, locker, or similar storage area prior to entering and during transit through	<p>A. Maximum Potential Loss</p> <p>65 of the 105 to 110 commercial fishing operations are potentially impacted. Some operations are multi-species fisheries. 27 lobster, 14 shrimp, 16 king mackerel, and 42 reef fish operations potentially impacted directly. About \$1.12 million in harvest revenue potentially lost or 16.45 % of the harvest revenue from the TERSA. On average, about \$17,300 per fishing operation. Additionally, potential losses to 10 fish houses and other small businesses through the multiplier impact.</p>	<p>A. Maximum Potential Loss</p> <p>10 of 12 charter boat operations operating within the TERSA would be potentially impacted. Direct business revenue would include 73.3% for diving for lobsters, 59% for spear fishing, and 10.5% for fishing. Across all three recreation consumptive activities, 28.7% of revenue would be potentially impacted and almost 41% of profits. On average, maximum potential losses are estimated to be about \$37,380 of lost revenue and \$14,500 of lost profits per operation. Additional potential losses to an unknown number of small firms through the multiplier impacts. Only a fraction</p>	<p>A. Maximum Potential Loss</p> <p>No losses. Potential gains to one charter boat dive operation providing services to non-consumptive divers. Indirect gains to several small businesses due to the multiplier impacts. Gains from improvements in quality of sites in terms of diversity, number and size of various sea life. Improvements in quality of experience leading to increase in demand for charter boat services and corresponding multiplier impacts on other small businesses.</p>	<p>A. Maximum Potential Loss</p> <p>No impact.</p>	<p>A. Maximum Potential Loss</p> <p>No expected impact. One permit for inventorying submerged cultural resources in Sanctuary waters was issued for the Tortugas area of the Sanctuary. There were no submerged cultural resources found. Currently, it is unknown whether there are any submerged cultural resources on Riley's Hump, located in Tortugas South.</p>
				<p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>No impact.</p>	<p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>No mitigating factors or offsetting factors. Sanctuary will not issue permits for treasure salvaging in the ecological reserve.</p>

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
<p>1. No Take (continued) such reserve, provided further that such vessel is in continuous transit through the ecological reserve.</p> <p>(b) Fishing by any means.</p> <p>(c) Touching living or dead coral, including but not limited to, standing on a living or dead coral formation.</p>	<p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>Relocation. For lobster fishing operations, the potential losses are not likely to occur because the State of Florida's trap reduction program and fishermen are knowledgeable of other fishing locations throughout the Sanctuary. For king mackerel operations, potential losses are not likely to occur because king mackerel is a pelagic species that is highly mobile and could be caught in other locations. For shrimp operations, losses are not likely to occur because shrimp caught in the proposed reserve are such a small percentage of total</p>	<p>of a percent of the total tourist/recreation business in Monroe County.</p> <p>B. Mitigating Factors, Off-setting Factors and Net Impact</p> <p>Substitution. Under this alternative, about 73% of diving for lobsters and 72% of spearfishing would be displaced. The potential for substituting to alternative sites is greatly reduced compared with Alternatives II and III. The reason is that under this alternative all of the Tortugas Bank falls within this boundary. Some alternative. Some substitution is possible, but the probability of crowding effects rises considerably for diving for lobsters and spearfishing. For fishing, substitution mitigating all the losses is still highly</p>	<p>Since no submerged cultural resources were located on Tortugas Bank, no expected impact.</p>	

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
1. No Take (continued)			Boundary Alternative IV (continued)	
	<p>catch. For reef fish, the potential losses are likely to occur in the short term because reef fish stocks are overfished throughout the Sanctuary.</p> <p>Long-term Benefits from Replenishment. No expected benefits to king mackerel or shrimp operations. For lobster operations, expected net benefits from replenishment effect of ecological reserve. For reef fish operations, it is not clear whether the full 28 percent lost catch from displacement would be replaced from replenishment, but the</p>	<p>probable since only 6 percent of fishing activity would be displaced. This represents a relatively low amount of activity and given the wide distribution of this activity in the study area, crowding effects are still a low probability.</p> <p>Long-term Benefits from Replenishment Effect. For diving for lobsters and spearfishing, it is not clear whether there would be significant benefits offsite given that most of this activity currently takes place on the Tortugas Bank and none of the Bank is available for these activities. Not much is known about other areas that might benefit from the replenishment effect and where users could relocate to reap these benefits.</p>		

Table 13. Impacts on Small Businesses (continued)

		Industries Impacted			
Regulation	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
1. No Take (continued)					
	costs of displacement would be mitigated and the losses to be less than the 28 percent reduction in the maximum loss case.	Whether the activities displaced could find alternative sites where both quantity and quality of activity could be maintained or enhanced seems less likely given the extent of displacement.			
		For fishing, the small amount of displacement relative to the entire area plus the wide distribution of fishing activity still makes it highly likely that long-term benefits of replenishment will more than offset the potential losses from displacement with net benefits to this group. Net result is short term losses and low likelihood of long-term gains to small businesses that are directly and indirectly dependent on recreational consumptive use in the TERSA. For fishing, small amount of displacement not likely to result in short term losses and likely long-term gains.			

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
Boundary Alternative IV (continued)				
2. No Anchoring/Required Mooring Buoy Use/No Discharges or Deposits				
(a) Anchoring on coral.	No incremental impact since "no take" regulations already displaces all commercial fishing.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	One charter operation that currently operates in Tortugas North potentially impacted. Mooring buoy use will constrain number and choice of available dive sites. It is unknown whether this will impact on future business of dive operators. Impact is dependent on the number and distribution (locations) of mooring buoys (to be determined). Prohibition on discharges or deposits results in no incremental impact.	No incremental impact since treasure salvaging displaced by "no take" regulations.
(b) Anchoring when mooring buoys or designated anchoring areas are available				
(c) Discharges or deposits except cooling water or engine exhaust.				
3. No Access				
Alternative A: Apply existing ecological reserve regulations to Tortugas North and South.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping
3. No Access (continued)				
Boundary Alternative IV (continued)				
Alternative B: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas South via permit and require call-in, call-out. Use of mooring buoys by vessels 100' or less in length.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No impact.
Alternative C: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas North and South via permit and require call-in, call-out (as described in Alternative B). Use of mooring buoys by vessels 100' or less in length.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Currently one charter dive operator operates in Tortugas North, while none operate in the South. Minor amount of time cost to charter operations in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve.. The current operator does not have vessels over 100 feet in length. Time costs expected to be limited to less than 15 minutes to obtain permit and access operation per visit to the reserve.	No impact.
				No incremental impact since "no take" regulations displaces treasure salvaging.
				No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued) Boundary Alternative IV (continued)					
Alternative D (Preferred): Apply existing ecological reserve regulations to Tortugas North and Tortugas South (as described in Alternative A). Prohibit anchoring in Tortugas North and South and control access to Tortugas North via permit and require call-in, call-out (as described in Alternative B). Restrict access to Tortugas South to research or educational activities only. Use of mooring buoys by vessels 100' or less in length.	No incremental impact since commercial fishing is already displaced by "no take" regulations.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	Currently one dive operator operates in Tortugas North, none in Tortugas South. Minor time costs to the dive charter operator in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve.. Time cost is expected to be less than 15 minutes per operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations					
Prohibited Activities					
a. Mineral and hydrocarbon exploration, development and production.	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
b. Removal of, injury to, or possession of coral or live rock.	No impact because the commercial and personal taking of coral and live rock is currently illegal. Live rock aquaculture permits will not be issued and none are currently in existence.	No impact because the commercial and personal taking of coral and live rock is currently illegal.	Not applicable.	Not applicable.	Not applicable.
c. Alteration of, or construction on the seabed (exemptions are made for installation of navigation aids & mooring buoys).	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
d. Discharge or deposit of materials or other matter except cooling water or engine exhaust.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)				
Prohibited Activities (continued)				
e. Operation of vessels that strike or injure coral or seagrass; anchoring on live coral in depths less than 40'; exceeding 4 knots or creating wakes in designated areas; injuring or taking birds or marine mammals.	No incremental impact because commercial fishing already displaced by "no take" regulations.	No incremental impacts because recreational consumptive users already displaced by "no take" regulations.	No impact expected because dive operators already operate in this manner. No firms currently operate in these areas.	No incremental impact since "no take" regulations displace treasure salvaging.
f. Conduct of diving/ snorkeling without a dive flag.	Not applicable.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No impact expected because use of flags is already required by other Federal and State regulations. No firms currently operate in these areas.	Not applicable.
g. Release of exotic species.	No impact because release of exotic species is already prohibited by other laws and there are no known aquaculture operations in the areas.	No impact because release of exotic species is already prohibited by other laws.	No impact because release of exotic species is already prohibited by other laws.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
h. Damage or removal of markers.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No Incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers. No firms currently operate in these areas.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers.	No incremental impact since "no take" regulations displace treasure salvaging.
i. Movement of, removal of, injury to, or possession of Sanctuary historical resources.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	No incremental impact since "no take" regulations displace treasure salvaging.
j. Take of possession of protected wildlife.	No impact because wildlife is already protected by other applicable law.	No impact because wildlife is already protected by other applicable law.	Not applicable.	Not applicable.	Not applicable.
k. Possession or use of explosives or electrical discharges (intent is to apply to take of marine species).	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.	Not applicable.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)				
Prohibited Activities (continued)				
i. Harvest or possession of marine life species (effect is to extend current State law into Federal waters).	No incremental impact because commercial fishing is already displaced by "no take" regulations. Currently there are no marine life collectors operating in these areas.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.
m. Interference with law enforcement.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No impact expected because this provision is consistent with existing laws providing for penalties for interfering with law enforcement. No firms currently operate in these areas.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive Boundary Alternative V	Commercial Shipping	Treasure Salvors
	A. Maximum Potential Loss	A. Maximum Potential Loss	A. Maximum Potential Loss	A. Maximum Potential Loss	A. Maximum Potential Loss
I. No Take					
(a) Possessing, moving, harvesting, removing, taking, damaging, disturbing, breaking, cutting, spearing, or otherwise injuring any coral, marine invertebrate, fish, bottom formation, algae, seagrass or other living or dead organism, including shells, or attempting any of these activities. However, fish, invertebrates, and marine plants may be possessed aboard a vessel in the ecological reserve provided such resources can be shown not to have been harvested within, removed from, or taken within, the ecological reserve, as applicable, by being stowed in a cabin, locker, or similar storage area prior to entering and during transit through	65 of the 105 to 110 commercial fishing operations are potentially impacted. Some operations are multi-species fisheries. 27 lobster, 14 shrimp, 16 king mackerel, and 42 reef fish operations potentially impacted directly. About \$1.22 million in harvest revenue potentially lost or 17.9% of the harvest revenue from the TERSA. On average, about \$18,843 per fishing operation. Additionally, potential losses to 10 fish houses and other small businesses through the multiplier impact.	11 of 12 charter boat operations operating within the TERSA would be potentially impacted. Direct business revenue would include 86.66% for diving for lobsters, 69% for spear fishing, and 12.88% for fishing. Across all three recreation consumptive activities, 34% of revenue would be potentially impacted and about 48% of profits. On average, maximum potential losses are estimated to be about \$40,248 of lost revenue and \$15,668 of lost profits per operation. Additional potential losses to an unknown number of small firms through the multiplier impacts. Only a fraction	No losses. Potential gains to one charter boat dive operation providing services to non-consumptive divers. Indirect gains to several small businesses due to the multiplier impacts. Gains from improvements in quality of sites in terms of diversity, number and size of various sea life. Improvements in quality of experience leading to increase in demand for charter boat services and corresponding multiplier impacts on other small businesses.	No impact.	No expected impact. One permit for inventorying submerged cultural resources in Sanctuary waters was issued for the Tortugas area of the Sanctuary. There were no submerged cultural resources found. Currently, it is unknown whether there are any submerged cultural resources on Riley's Hump, located in Tortugas South.
				B. Mitigating Factors, Off-setting Factors and Net Impact	B. Mitigating Factors, Off-setting Factors and Net Impact
				No impact.	No mitigating factors or offsetting factors. Sanctuary will not issue permits for treasure salvaging in the ecological reserve.

Table 13. Impacts on Small Businesses (continued)

		Industries Impacted			
Regulation	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
Boundary Alternative V (continued)					
1. No Take (continued)					
such reserve, provided further that such vessel is in continuous transit through the ecological reserve.	B. Mitigating Factors, Off-setting Factors and Net Impact Crowding and Relocation. For lobster fishing operations, there is some potential for crowding costs. However, the potential losses are not likely to occur because the State of Florida's trap reduction program and fishermen are knowledgeable of other fishing locations throughout the Sanctuary. For king mackerel operations, potential losses are not likely to occur because king mackerel is a pelagic species that is highly mobile and could be caught in other locations. For shrimp operations, losses are	of a percent of the total tourist/recreation business in Monroe County.			Since no submerged cultural resources were located on Tortugas Bank, no expected impact.
(b) Fishing by any means.		B. Mitigating Factors, Off-setting Factors and Net Impact Substitution. This alternative displaces 87% of the diving for lobsters and 85% of the spearfishing. Substitution possibilities for these activities are extremely low given that this alternative eliminates access to the Tortugas Bank. Losses close to the maximum potential are more likely for these two activities. For fishing, mitigating all the losses through substitution is still highly probable since only 8% of the fishing activity would be displaced. This represents a low amount of activity and given the wide distribution of fishing activity throughout the study area, crowding effects are still a low probability.			
(c) Touching living or dead coral, including but not limited to, standing on a living or dead coral formation.					

Table 13. Impacts on Small Businesses (continued)

		Industries Impacted			
Regulation	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
1. No Take (continued)					
	<p>not likely to occur because shrimp caught in the proposed reserve are such a small percentage of total catch. For reef fish, the potential losses are likely to occur in the short term because reef fish stocks are overfished throughout the Sanctuary.</p> <p>Long-term Benefits from Replenishment.</p> <p>No expected benefits to king mackerel or shrimp operations. For lobster operations, expected net benefits from replenishment effect of</p>	<p>Long-term Benefits from Replenishment Effect.</p> <p>Although four of the five spawning sites identified in the western portion of the TERSA are within this boundary alternative, the displacement from the entire Tortugas Bank makes it highly unlikely that those diving for lobsters or spearfishing will benefit and will most likely suffer losses close to the maximum potential.</p> <p>For fishing, the stock effects or replenishment effect could be substantial. Whether the benefits would be large enough to offset displacement cannot be determined. But given the past experience with reserves, it is still somewhat likely that long-term benefits would offset</p>			

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted			
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Treasure Salvors
1. No Take (continued)	ecological reserve. For reef fish operations, it is not clear whether the full 29 percent lost catch from displacement would be replaced from replenishment, but the costs of displacement would be mitigated and the losses to be less than the 29 percent reduction in the maximum loss case.	displacement costs yielding net benefits to fishing. Net result is short term losses and long-term losses to small businesses that are directly and indirectly dependent on recreational diving for lobsters and spearfishing in the TERSA. Possibility of small short term losses to fishing, but long-term gains from replenishment effect.		

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
Boundary Alternative V (continued)					
2. No Anchoring/Required Mooring Buoy Use/No Discharges or Deposits					
(a) Anchoring on coral.	No incremental impact since "no take" regulations already displace all commercial fishing.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	One charter operation currently operating in Tortugas North potentially impacted. Mooring buoy use will constrain number and choice of available dive sites. It is unknown whether this will impact on future business of dive operators. Impact is dependent on the number and distribution (locations) of mooring buoys (to be determined). Prohibition against discharges or deposits results in no incremental impact.	No impact.	No incremental impact since treasure salvaging displaced by "no take" regulations.
(b) Anchoring when mooring buoys or designated anchoring areas are available					
(c) Discharges or deposits except cooling water or engine exhaust.					
3. No Access					
Alternative A: Apply existing ecological reserve regulations to Tortugas North and South.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
3. No Access (continued)					
Alternative B: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas South via permit and require call-in, call-out. Use of mooring buoys by vessels 100' or less in length.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No incremental impact. See regulations 1 and 2 above.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.
Alternative C: Apply existing ecological reserve regulations to Tortugas North and South (as described in Alternative A). Prohibit anchoring in and control access to Tortugas North and South via permit and require call-in, call-out (as described in Alternative B). Use of mooring buoys by vessels 100' or less in length.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Currently one charter dive operator operates in Tortugas North, while none operate in the South. Minor amount of time cost to charter operations in reporting to Sanctuary staff to obtain permit and to notify when entering and leaving ecological reserve. The current operator does not have vessels over 100 feet in length. Time costs expected to be limited to less than 15 minutes to obtain permit and access operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
3. No Access (continued)					
Alternative D (Preferred): Apply existing ecological reserve regulations to Tortugas North and Tortugas South (as described in Alternative A). Prohibit anchoring in Tortugas North and South and control access to Tortugas North via permit and require call-in, call-out (as described in Alternative B). Restrict access to Tortugas South to research or educational activities only. Use of mooring buoys by vessels 100' or less in length.	No incremental impact since commercial fishing is already displaced by "no take" regulations.	No incremental impact since recreational consumptive users are already displaced by "no take" regulations.	Currently one dive operator operates in Tortugas North, none in Tortugas South. Minor time costs to the dive charter operator in reporting to Sanctuary staffer to obtain permit and to notify when entering and leaving ecological reserve. Time cost is expected to be less than 15 minutes per operation per visit to the reserve.	No impact.	No incremental impact since "no take" regulation displaces treasure salvaging.
	4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations				
Prohibited Activities					
a. Mineral and hydrocarbon exploration, development and production.	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).	No impact because the regulations only affect mineral and hydrocarbon firms (they are not small businesses).

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
b. Removal of, injury to, or possession of coral or live rock.	No impact because the commercial and personal taking of coral and live rock is currently illegal. Live rock aquaculture permits will not be issued and none are currently in existence.	No impact because the commercial and personal taking of coral and live rock is currently illegal.	Not applicable.	Not applicable.	Not applicable.
c. Alteration of, or construction on the seabed (exemptions are made for installation of navigation aids & mooring buoys).	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
d. Discharge or deposit of materials or other matter except cooling water or engine exhaust.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No impact. Other existing regulations already prohibit such discharges.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
e. Operation of vessels that strike or injure coral or seagrass; anchoring on live coral in depths less than 40'; exceeding 4 knots or creating wakes in designated areas; injuring or taking birds or marine mammals.	No incremental impact because commercial fishing already displaced by "no take" regulations.	No incremental impacts because recreational consumptive users already displaced by "no take" regulations.	No impact expected because dive operators already operate in this manner. No firms currently operate in these areas.	No impact.	No incremental impact since "no take" regulations displace treasure salvaging.
f. Conduct of diving/snorkeling without a dive flag.	Not applicable.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No impact expected because use of flags is already required by other Federal and State regulations. No firms currently operate in these areas.	Not applicable.	Not applicable.
g. Release of exotic species.	No impact because release of exotic species is already prohibited by other laws and there are no known aquaculture operations in the areas.	No impact because release of exotic species is already prohibited by other laws.	No impact because release of exotic species is already prohibited by other laws.	No impact because release of exotic species is already prohibited by other laws.	No incremental impact since "no take" regulations displace treasure salvaging.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				Treasure Salvors
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
h. Damage or removal of markers.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers. One firm currently operates in these areas.	No incremental impact expected because such prohibitions already exist for markers placed by other governmental entities and the regulation only applies to Sanctuary markers.	No incremental impact since "no take" regulations displace treasure salvaging.
i. Movement of, removal of, injury to, or possession of Sanctuary historical resources.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	No incremental impact since "no take" regulations displace treasure salvaging.
j. Take or possession of protected wildlife.	No impact because wildlife is already protected by other applicable law.	No impact because wildlife is already protected by other applicable law.	Not applicable.	Not applicable.	Not applicable.
k. Possession or use of explosives or electrical discharges (intent is to apply to take of marine species).	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.	Not applicable.

Table 13. Impacts on Small Businesses (continued)

Regulation	Industries Impacted				
	Commercial Fishing	Recreation Consumptive	Recreation Non-consumptive	Commercial Shipping	Treasure Salvors
4. Boundary Expansion Areas: Additional Sanctuary-wide Regulations (continued)					
Prohibited Activities (continued)					
l. Harvest or possession of marine life species (effect is to extend current State law into Federal waters).	No incremental impact because commercial fishing is already displaced by "no take" regulations. Currently there are no marine life collectors operating in these areas.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	Not applicable.	Not applicable.	Not applicable.
m. Interference with law enforcement.	No incremental impact because commercial fishing is already displaced by "no take" regulations.	No incremental impact because recreational consumptive users are already displaced by "no take" regulations.	No impact expected because this provision is consistent with existing laws providing for penalties for interfering with law enforcement. One firm currently operates in these areas.	No impact expected because this provision is consistent with existing laws providing for penalties for interfering with law enforcement.	No incremental impact since "no take" regulations displace treasure salvaging.

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Selection of the Preferred Alternative

This section sets forth the Preferred Alternative and why it was selected as the Preferred Alternative.

Preferred Alternative

The Preferred Alternative is Boundary Alternative III (Figure 1) combined with Regulatory Alternative D.

General Rationale

Boundary Alternative III combined with Regulatory Alternative D has been selected as the Preferred Alternative because this combination achieves the objectives of all of the criteria listed below.

This Preferred Alternative is of sufficient size and imposes adequate protective measures to satisfy the selection criteria and to fulfill the goals and objectives of the FKNMSPA and the NMSA. Boundary Alternative III is consistent with the recommendations of the WG and SAC to NOAA and the State of Florida. While the WG and SAC recommended Regulatory Alternative A (application of the existing Sanctuary-wide and existing ecological reserve regulations), the more protective approach of Regulatory Alternative D is warranted because of the threat to coral reef resources posed by the anchoring of vessels, the threat to the sensitive resources of Tortugas South from non-consumptive activities, and the difficulty of enforcement in this remote area, particularly in Tortugas South. Extremely high coral cover and deep water in the Tortugas preclude anchoring without damaging coral.

The Preferred Regulatory Alternative in the DSEIS was Alternative C. The Preferred Regulatory Alternative in the FSEIS is Alternative D. Under Alternative D, Tortugas South will be

accessible only for continuous transit and law enforcement or, pursuant to a sanctuary permit, for scientific research and educational purposes. This change was made because of comments received regarding the potential effects of non-consumptive activities, particularly non-consumptive diving. Alternative D will better protect resources in Tortugas South, such as the spawning aggregation areas, which are more sensitive to this activity than those in Tortugas North, and will enhance enforcement surveillance in this remote part of the Reserve. Leaving Tortugas North accessible to non-consumptive activities, including diving, will not only provide significant opportunities for resource appreciation and public education but will also allow the comparison of Tortugas North to Tortugas South over time to better understand and document the possible effects of non-consumptive diving in Tortugas North. The permit system for access to Tortugas North will provide information that will allow NOAA to determine the number of vessels and divers using the area and will assist in monitoring impacts.

The final regulations are revised from those proposed to make them consistent with Regulatory Alternative D. Also, the prohibition on fishing has been revised to prohibit all fishing in the Reserve without exception. This change was made in response to comments that the prohibition should be issued under the NMSA and that the exception clause that would have authorized fishing to the extent allowed under regulations issued pursuant to the Magnuson-Stevens Fishery Conservation and Management Act should be eliminated. Regulations issued under the Magnuson-Stevens Act must satisfy the requirements of that Act including the National Standards set forth in that Act.

Sanctuary regulations including those governing fishing are issued under the NMSA. While some of the goals and objectives of the two Acts are similar, many of the goals and objectives of the two statutes are different.

Comparison of Alternatives

This section compares Boundary Alternatives II-V and Regulatory Alternatives A-D based on the selection criteria. Boundary Alternative I, the No-Action Alternative, is not compared because it would not be consistent with the goals of the FKNMSPA, the NMSA, the MP for the Sanctuary, and Executive Order 13089. Among other things, Part V of the FSEIS sets forth the environmental and socio-economic consequences of the No-Action Alternative. The selection criteria are: (1) protect ecosystem integrity; (2) protect biodiversity, including the maintenance or restoration of viable populations of native species; (3) enhance scientific understanding of marine ecosystems; (4) facilitate human uses to the extent consistent with meeting the other criteria; (5) minimize adverse socio-economic impacts to the extent consistent with meeting the other criteria; and (6) facilitate enforcement and compliance (Table 14). Subcriteria for and the goals and sources of each of the criteria are set forth in the table below. The criteria are consistent with the goals of the FKNMSPA, the NMSA, the MP, public scoping comments, design criteria developed by the Tortugas 2000 Working Group, Executive Order 13089 regarding Coral Reef Protection, the U.S. Coral Reef Task Force (CRTF) recommendations, and scientific literature on marine reserves. The criteria have been revised from those contained in the DSEIS based on comments received.

TABLE 14

Criteria	Objective	Rationale/Source
<p>Protect ecosystem integrity. This includes the following sub-criteria:</p> <ul style="list-style-type: none"> • Protect a wide range of contiguous habitats through deep water. • Maximize connectivity among habitats. • Protect unique coral formations and areas of high coral cover, including Sherwood Forest. • Provide adequate buffer areas. • Sustain ecological & evolutionary processes. • Protect against short and long-term environmental perturbations, and, 	<p>Choose an area and protection measures that protect a wide range of contiguous habitats, establish connectivity between those habitats, and protect unique structural formations.</p>	<p>FKNMSPA, NMSA, public comment, Working Group, CRTF, and literature</p>

TABLE 14—Continued

Criteria	Objective	Rationale/Source
<ul style="list-style-type: none"> • Encompass an area that is large enough and sufficiently protected that, when combined with existing protections, maintains the Tortugas region's contribution to the Florida Keys' ecosystem. Protect biodiversity, including the maintenance or restoration of viable populations of native species. This includes the following sub-criteria: <ul style="list-style-type: none"> • Protect the full range of species. • Protect natural spawning, nursery, and permanent residence areas, including Riley's Hump. • Protect and enhance commercially and recreationally important fish species. • Protect species with specific habitat requirements. • Protect endangered, threatened, rare, or imperiled species. • Protect areas with physical oceanographic characteristics that will enhance larval dispersal. • Protect areas of high coral and fish diversity. • Protect areas of high productivity. • Protect foraging areas for seabird and endangered sea turtle populations, and, • Protect areas of high endemism. 	Choose an area and protection measures that will protect areas of high biodiversity, known or reported spawning areas and habitats that support resident fish and other marine life.	Final Management Plan, public comment, Working Group, and literature
Enhance scientific understanding of marine ecosystems. This includes the following sub-criteria: <ul style="list-style-type: none"> • Provide a reference area to monitor the effects of both consumptive and non-consumptive activities on ecosystem structure and processes, and, • Provide a reference area to discriminate between human-caused and natural changes in the Florida Keys' marine ecosystem. 	Choose an area and protection measures that will facilitate the monitoring of anthropogenic impacts and the evaluation of the efficacy of the ecological reserve for protecting coral reef health and biodiversity.	FKNMSPA, NMSA, public comment, Working Group, CRTF, and literature
Facilitate human uses to the extent consistent with the other criteria	Choose an area and protection measures that will allow uses and provide a range of habitats to observe and study, consistent with the attainment of the other objectives.	FKNMSPA, NMSA, Final Management Plan, public comment, Working Group, and literature
Minimize adverse socio-economic impacts to the extent consistent with the other criteria.	Choose an area and protection measures that meet the objectives of the other criteria but that do not unduly impact users.	FKNMSPA, NMSA, public comment, and Working Group
Facilitate enforcement and compliance	Choose an area and protection measures that facilitate enforcement of the ecological reserve and encourage compliance by users.	Working Group and literature

Protect ecosystem integrity. Boundary Alternative II does not encompass enough range of habitat or area to adequately protect the integrity of the ecosystem. Boundary Alternative II does not adequately protect the full range of habitats and species found in the Tortugas area. The unique and ancient coral formations of Sherwood Forest are not part of this alternative. Boundary Alternative II does not include contiguous habitats nor is connectivity between habitats maximized. Boundary Alternative II does not provide a reasonable buffer area for coral reef

features. Alternative II includes no deep water habitats greater than approximately 200 feet. By not having two reserve components, Alternative II offers no insurance against the effects of a catastrophic event (e.g., cold weather, low salinity) that could potentially damage resources of the area. Alternative II is not large enough to sustain local or regional ecological or evolutionary processes. Boundary Alternatives III, IV and V, when combined with existing protections in the region, are sufficient to protect ecosystem integrity in the Tortugas and

that region's contribution to the Florida Keys ecosystem. Boundary Alternatives III-V include two replicate components that help to ensure against the effects of catastrophic events. Boundary Alternative III includes a sufficient range of essential habitats for many species life stages and includes adequate buffers. The increased area of Boundary Alternatives IV and V has negligible increased benefit to protecting ecosystem integrity compared to Alternative III. Boundary Alternative V does not capture additional significant habitat to the west of the

Tortugas Bank and does not preserve the critical deep water habitat south of Riley's Hump. Regulatory Alternative A would not adequately protect ecosystem integrity because of the threat to coral reef resources by anchoring. Regulatory Alternative B would not adequately protect ecosystem integrity in Tortugas North and the Sherwood Forest area because of the threat to coral reef resources by anchoring. Regulatory Alternative C adequately protects ecosystem integrity by prohibiting anchoring and controlling access to Tortugas North and South via an access permit. Regulatory Alternative D increases protection of ecosystem integrity over Alternative C by prohibiting access to Tortugas South except by permit for research or educational reasons. This will virtually eliminate human degradation and protect the ecological integrity of the Tortugas region.

Protect biodiversity, including the maintenance or restoration of viable populations of native species. Boundary Alternative II does not protect the high coral species diversity of Sherwood Forest or the unique fish species richness of Tortugas South. Boundary Alternative II protects only one of eight known fish spawning aggregations and does not include Riley's Hump, which is an area of high endemism and a critical source area for larvae. Sherwood Forest, an important permanent residence area for a variety of species and area of high productivity, is not part of Alternative II. Boundary Alternative III protects 5 of the 8 known fish spawning areas as well as approximately 87% of the known coral reef habitat and 76% of the known hardbottom habitat. Boundary Alternative III also protects the habitat of several commercially important fish species and several uncommon species found in the deep water regions of Tortugas South. Boundary Alternatives III, IV, and V protect the high coral diversity of Sherwood Forest and they protect Riley's Hump and the deep habitat around it which are a critical source of larvae for downstream areas of the Florida Keys. In addition, they help protect important foraging areas for seabirds and sea turtles. Boundary Alternative IV encompasses 7 of the 8 known fish spawning sites as well as 100% of the known coral and hardbottom habitat. Boundary Alternative V encompasses 7 of the 8 known fish spawning sites and would protect all of the known coral and hardbottom habitat. Alternative V's expansion of Tortugas North to the west would provide increased protection for

some additional habitats and associated species. However, its reduction in size of Tortugas South would provide less protection for critical deep water habitats and thereby has the least protection for associated species such as golden crab and snowy grouper. Regulatory Alternative A would not adequately preserve biodiversity and maintain viable populations because of the threat to associated habitats of many species by anchoring and the lack of protection for high diversity areas such as Sherwood Forest and Riley's Hump. Regulatory Alternative B would not adequately preserve biodiversity and maintain viable populations in Tortugas North because of the threat to associated habitats of many species by anchoring. Regulatory Alternative C would preserve biodiversity by prohibiting habitat destruction from anchoring. However, Regulatory Alternatives A, B, and C would not protect the several natural fish spawning aggregations in Tortugas South from disturbance. Regulatory Alternative D would adequately preserve biodiversity and maintain viable populations by protecting critical habitat in Tortugas North and Tortugas South from anchor damage and by minimizing disturbance to natural spawning aggregations in Tortugas South.

Enhance scientific understanding of marine ecosystems. Given the absence of unexploited areas in the Tortugas region, Boundary Alternatives II-V would all serve to increase our scientific understanding of marine ecosystems and their response to management of consumptive and non-consumptive activities, including their recovery from fishing impacts. Boundary Alternatives II-V would also facilitate scientific understanding by providing a reference area to gauge the broader changes occurring in the Florida Keys marine ecosystem. Boundary Alternatives III-V offer the added scientific benefit of protecting Riley's Hump, which would add to our knowledge of effective reserve design regarding networks and energy flow between marine reserves. The inclusion of Tortugas South will also significantly add to our knowledge of the importance of the Tortugas region in sustaining the Florida Keys ecosystem. Boundary Alternatives IV and V encompass all of Tortugas Bank and would compromise the study of fishing effects because there would be no comparable habitat for use as a reference site. Regulatory Alternatives A, B, and C would provide for essentially the same level of scientific understanding. Regulatory Alternative D will facilitate the most scientific

understanding of human effects on ecosystem processes because it would create a research/education-only area in the Tortugas which could serve as a reference site from which to gauge the impacts of non-consumptive activities.

Facilitate human uses to the extent consistent with the other criteria. All of the alternatives would serve well in enhancing opportunities for non-consumptive activities such as education, photography, underwater wilderness exploration, and ecotourism. Boundary Alternatives III-V provide enhanced opportunities over Boundary Alternative II because of the addition of Tortugas South and the expansion of Tortugas North to include the unique coral reef region known as Sherwood Forest. Regulatory Alternatives A, B, and C would provide the same non-consumptive opportunities. Though Regulatory Alternative D will prohibit all consumptive and non-consumptive activities in Tortugas South other than research and education, the disallowance of these activities will establish Tortugas South as a critical reference area by which any impacts of the non-consumptive activities occurring in Tortugas North may be assessed.

Minimize adverse socio-economic impacts to the extent consistent with the other criteria. As stated in Part V of the FSEIS, all users are considered to be small entities within the meaning of the Regulatory Flexibility Act. Boundary Alternatives I and II and Regulatory Alternatives A, B, and C would have less of an adverse impact on users than the Preferred Alternative (Boundary Alternative III coupled with Regulatory Alternative D). Boundary Alternatives IV and V would have a greater adverse impact on users than the Preferred Boundary Alternative. Boundary Alternative III has moderate impacts on users, mostly lobster fishermen and handline fishermen. Alternatives IV and V have significantly greater impacts because they include the southern half of Tortugas Bank, which is heavily utilized by both recreational and commercial users. Alternative III offers a compromise because it allows for continued consumptive use of the southern half of Tortugas Bank including trolling for pelagic fish species. Ignoring the potential of such effects as replenishment that would result in a net economic benefit, Regulatory Alternative A has significant adverse socio-economic effects on users. There are 12 recreational charter operations that would be affected by this alternative and approximately 110 commercial fishing operations. Regulatory Alternative A would not