PLAN FORMULATION APPENDIX

FLORIDA KEYS COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY MONROE COUNTY, FLORIDA

DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT

APPENDIX A

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U.S. Army Corps
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This appendix provides more detail to support the information presented in Chapter 6 of the main report, including more extensive discussion of the analysis completed during measures screening and the assessment of other social effects of the eight alternatives considered in the study.

1 ADDITIONAL DETAILED MEASURES SCREENING INFORMATION

1.1 STRUCTURAL MEASURES SCREENING

Breakwaters: Breakwaters are usually rock structures that are constructed just offshore from sandy beaches to reduce wave energy on the coastline. When considering this measure, beaches with breakwaters already in place were screened out because overcrowding a beach with breakwaters has negative effects. Two areas, Bahia Honda State Park and Boca Chica Beach, were identified as the only locations where breakwaters were a suitable measure from an engineering standpoint only. However, though it would be appropriate from an engineering standpoint to construct breakwaters at these two sites, there are no structures (buildings, roads, etc.) located behind them that would benefit from them in terms of reduced damage due to coastal storms. In addition, the breakwater at Boca Chica Beach could not be included in this study because it is located along Federal Government property, which cannot be included in a Civil Works study. There are also concerns that the construction of a breakwater in the Bahia Honda location could have fatal consequences for the coral reefs in the vicinity. For these reasons, breakwaters were screened from further consideration.

At the request of the NFS, breakwaters were considered at Sea Oats Beach, even after they had been initially screened from consideration for the reasons identified in the main report and this appendix because the NFS was concerned about risk to the roadway in this area in particular. Breakwaters are typically placed parallel to the shoreline to slow down waves to protect a beach. Revetments (shoreline stabilization) are placed along a shoreline to protect adjacent structures from erosion, waves and encroaching water. Armoring the shoreline with revetments help reduce the amount of erosion due to overwashing. Because they require a larger quantity of rock to construct, breakwaters are usually more expensive to construct than revetments. The environmental impact to the area is also greater with breakwaters since the ocean floor and surrounding areas are disturbed during construction. In response to this request, the engineering team developed a simple design for revetments and breakwaters along the Sea Oats Beach portion of US 1 for a cost comparison between the revetment that was already proposed for the area initially. Based on parametric cost estimates, the breakwater construction cost in this area would be approximately seven million dollars and shoreline stabilization (revetment) would be one million dollars. The seven million for the breakwater does not include the environmental costs and likely impacts to coral reefs or other aquatic habitat or species that would require costly environmental mitigation. In this case, revetments are more cost effective and would provide the same level of risk reduction to U.S. 1 at Sea Oats Beach. Revetments are also an appropriate measure in this location as they are typically used to prevent erosion damage to roads.

The NFS also asked the PDT to consider improvements to existing breakwaters at Duck Key. The PDT reviewed information sent by the NFS for this area, and also determined that improving the existing breakwaters at Duck Key would not reduce structure damage significantly enough to justify the cost of the construction to make those improvements, especially when environmental mitigation is considered as part of the project cost.

Shoreline Stabilization: Even though FDOT has the primary responsibility to maintain and repair U.S. 1, at this time, the agency does not have a comprehensive plan to reduce the risk of coastal storm damage the roadway. For this reason that this study included the roadway in this analysis and recommended a measure that would reduce damage to the roadway. Shoreline stabilization, in this case, rock revetment, was initially recommended for 15 locations along U.S. 1 to reduce coastal storm damage to the roadway. Engineering PDT members initially identified 15 locations for shoreline stabilization based on a review of aerial imagery to identify areas where the shoreline looked to be encroaching on the road, there was less than 100 linear feet of land from the edge of the roadway to the water, and there was evidence of a high energy and/or erosion. The resulting 15 locations for shoreline stabilization along U.S. 1 were then evaluated in G2CRM to determine economic benefit (damage). Cost estimates were also developed for each area that included the cost to construct the revetment, real estate required based on the design footprints, and the environmental mitigation that would be required based on the impacts to natural resources. The results of this analysis are shown in Table 1.

Table 1. Results of Initial U.S. Route 1 Revetment Analysis

Description	Annual Benefit	Total Cost	Annual cost	Interest During Construction (IDC)	Annual cost + IDC	Annual Net Benefits	BCR
Cudjoe Key	$ 43,848	$ 2,430,853	$ 90,041	$ 3,707	$ 93,748	$ (49,900)	0.47
Spanish Harbor Key 1	$ 60,948	$ 2,892,665	$ 107,147	$ 4,411	$ 111,558	$ (50,610)	0.55
Spanish Harbor Key 2	$ 31,313	$ 2,795,311	$ 103,541	$ 4,262	$ 107,803	$ (76,491)	0.29
Spanish Harbor Key 3	$ 10,844	$ 877,878	$ 32,517	$ 1,339	$ 33,856	$ (23,012)	0.32
Bahia Honda Key	$ 85,398	$ 2,753,283	$ 101,984	$ 4,198	$ 106,182	$ (20,784)	0.80

Description	Annual Benefit	Total Cost	Annual cost	Interest During Construction (IDC)	Annual cost + IDC	Annual Net Benefits	BCR
Duck Key 1	$ 34,159	$ 1,330,562	$ 49,285	$ 2,029	$ 51,314	$ (17,155)	067
Duck Key 2	$ 56,932	$ 3,519,427	$ 130,363	$ 5,366	$ 135,729	$ (78,797)	0.42
Long Key	$ 56,932	$ 1,342,576	$ 49,730	$ 2,047	$ 51,777	$ 5,155	1.10
Fiesta Key 1	$ 18,695	$ 3,039,414	$ 112,583	$ 4,635	$ 117,217	$ (98,522)	0.16
Fiesta Key 2	$ 16,024	$ 2,068,033	$ 76,602	$ 3,153	$ 79,755	$ (63,731)	0.20
Fiesta Key 3	$ 6,729	$ 1,214,623	$ 44,991	$ 1,852	$ 46,843	$ (40,114)	0.1
Sea Oats Beach	$ 250,557	$ 4,851,946	$ 179,721	$ 7,398	$ 187,119	$ 63,438	1.3
Indian Key 1	$ 87,695	$ 3,201,860	$ 118,600	$ 4,882	$ 123,482	$ (35,787)	0.71
Indian Key 2	$ 131,543	$ 2,362,947	$ 87,526	$ 3,603	$ 91,129	$ 40,414	1.4
Indian Key 3	$ 43,848	$ 1,167,225	$ 43,235	$ 1,780	$ 45,015	$ (1,167)	0.97
Total	**$ 935,463**	**$ 35,848,603**	**$ 1,327,865**	**$ 54,663**	**$ 1,382,528**	**$ (447,064)**	**0.68**

When the results of this analysis showed that the majority of the initial 15 shoreline stabilization areas were not economically justified, the team determined that the high environmental mitigation costs were the main reason for the low BCRs. The team then made the decision to revise the designs for the areas so that there would be no in water impacts, which based on the initial impact assessment for mitigation were very costly to mitigate. As a result, the footprints for each revetment area were moved back above mean high water where possible. The engineering and environmental PDT members also made a site visit to the 15 revetment sites in

December of 2019 where they made observations regarding the existing condition and erosion risk that were not possible using the previous existing information that was used to initially identify the initial 15 locations. There were also some areas where it was determined that the impacts to existing mature mangroves and other vegetation were not acceptable impacts. During the design refinement period, the team also coordinated heavily with FDOT to identify where they would be making improvements to U.S. Route 1 that would conflict with or be redundant with the 15 shoreline stabilization areas identified by the PDT. Table 2 provides a summary of how the site visit, design refinements, and FDOT coordination was used to screen the initial 15 areas down to the resulting six that were recommended in the TSP.

Table 2. Screening of Initial U.S. Route 1 Revetment Areas	
Cudjoe Key	Site visit confirmed that this site is heavily vegetated with mangrove and buttonwood and that the shoreline appeared stable and not at high risk to erosion due to the existing vegetation and limestone rock so this revetment was screened from further consideration.
Spanish Harbor Key 1	FDOT is constructing a revetment in May 2020 that is equivalent to the one designed by the PDT in the same footprint at this site. The engineering team reviewed the 100% design for this revetment and determined it will provide the same level of risk reduction, so this revetment was screened from further consideration.
Spanish Harbor Key 2	Revetment at this site was carried forward to be included in the TSP as Spanish Harbor Key.
Spanish Harbor Key 3	FDOT is constructing a revetment in May 2020 that is equivalent to the one designed by the PDT in the same footprint at this site. The engineering team reviewed the 100% design for this revetment and determined it will provide the same level of risk reduction, so this revetment was screened from further consideration.
Bahia Honda Key	Revetment at this site was carried forward to be included in the TSP.
Duck Key 1	Site visit confirmed that this site is heavily vegetated with mangrove and buttonwood and that the shoreline appeared stable and not at high risk to erosion so this revetment was screened from further consideration.
Duck Key 2	Site visit confirmed that this site is heavily vegetated with mangrove and buttonwood and that the shoreline appeared stable and not at high risk to erosion so this revetment was screened from further consideration.
Long Key	Revetment at this site was carried forward to be included in the TSP.

Fiesta Key 1	This revetment was combined with the proposed Fiesta Key 2 revetment and was carried forward to be included in the TSP as Fiesta Key West.
Fiesta Key 2	This revetment was combined with the proposed Fiesta Key 1 revetment and was carried forward to be included in the TSP as Fiesta Key West.
Fiesta Key 3	Revetment at this site was carried forward to be included in the TSP as Fiesta Key East.
Sea Oats Beach	FDOT is improving the existing articulated concrete block to include better anchoring in May 2020. Engineering team members reviewed the 100% designs for this shoreline stabilization project and determined that it provides a comparable level of risk reduction to the revetment that was proposed in this area. In addition to the shoreline stabilization project, FDOT is also elevating the road in this location 1.7 feet in 2022, so this revetment was screened from further consideration.
Indian Key 1	FDOT is constructing a revetment in May 2020 that is equivalent to the one designed by the PDT in the same footprint at this site. The engineering team reviewed the 100% design for this revetment and determined it will provide the same level of risk reduction, so this revetment was screened from further consideration
Indian Key 2	FDOT is constructing a revetment in May 2020 that is equivalent to the one designed by the PDT in the same footprint at this site. The engineering team reviewed the 100% design for this revetment and determined it will provide the same level of risk reduction, so this revetment was screened from further consideration
Indian Key 3	Revetment at this site was carried forward to be included in the TSP as Indian Key Fill.

The resulting six revetment areas include Spanish Harbor Key, Bahia Honda Key, Long Key, Fiesta Key West, Fiesta Key East, and Indian Key Fill.

Roadway Elevation: This measure would increase the road elevation to allow vehicles access to and from impacted areas during a storm event. In the study area, elevation was considered along U.S. Route 1 to maintain the ability to travel on the route even with some storm surge from a coastal storm. However, such a significant portion of the roadway would be inundated a significant amount during a storm event, that maintaining travel during a surge event is not feasible due to the extensive road elevation that would be needed to gain even a low level of benefit. The PDT concluded that protecting sections of the road at risk to wash out or land loss

effects can be managed with shoreline stabilization, which has been included in the array of alternatives. Road elevation was screened from further consideration for the following reasons:

- Roadway sections would require increased transitions from side streets to tie into the elevated road. An increase of five inches equates to an approximate length increase of 21 feet to transition to the existing grade of the side street. Retaining walls may be required to tie into the right-of-way or other fixed object such as a building, fence, or wall.
- Roadway sections will either require increasing the slope from the edge of pavement to the existing right-of-way or maintaining the typical section on either side of the roadway which more than likely will encroach beyond the right-of-way line. The net result would be that property owners would be impacted by the loss of land area and property value. The cost of compensating these land owners to acquire the real estate needed would increase the already high cost of the road elevation itself.

Canal Improvements: This measure would include improvements to the residential canals throughout the study area, to include hardening/protection of the shorelines, dredging and debris removal, or filling as appropriate. Canal improvements were screened from further consideration by the PDT for the following reasons:

- Coastal engineers have established that there would not be a measurable reduction in storm surge or wave action during a significant coastal storm event gained by improving these small canals.
- If there is not a measurable reduction in the effects of coastal storms that would meet the study objective of reducing damage in the study area, there would be no way to quantify an economic benefit to justify the cost of improvements to the canals

Sea Walls and Flood Walls: This measure would include traditional, large scale sea or flood walls that would serve as a barrier to coastal storm surge and wave action to reduce damage to the structures behind them. Sea Walls were screened from further consideration for the following reasons:

- For a sea wall to be constructed in a coastal setting, there must be higher ground to tie the end of the wall in. In the Keys, the terrain is flat and there are not locations where there is high ground to end a wall structure. This would require a ring wall to be constructed on every single Island of the Keys. This is not acceptable from a cost or lifestyle standpoint for residents and tourists in the Keys.
- Existing walls were considered for elevation and/or improvement, such as the one south of the airport. However, due to the flat and low elevation of the islands, a partial wall would not further reduce impacts from coastal storms since storm surge would intrude into the area behind the wall from the unprotected areas.

Levees: This measure is similar to sea walls and flood walls in the method and level of risk reduction. However, levees require a large footprint because unlike walls, they are constructed

from earthen fill and require a trapezoidal design. Levees were screened from further consideration for the following reasons

- The area needed to construct a levee is not available in a fully developed coastal urban environment like the Keys.
- Similar to a sea wall, for a levee to be constructed in a coastal setting, there must be higher ground to tie the end of the structure in. In the Keys, the terrain is flat and there are not locations where there is high ground to end a levee structure. This would require a ring levee to be constructed on every single Island of the Keys. This is not acceptable from a cost or lifestyle standpoint for residents and tourists in the Keys.

Storm Surge Barriers: Storm surge barriers are some sort of gate or closure across an inlet or other body of water that prevent storm surge and waves from affecting areas in the vicinity of that water body. This measure is typically coupled with some type of seawall, floodwall, or levee or must be able to tie into higher ground to provide temporary or as needed protection for geographic gaps and inlets. Surge barriers were considered across the study area, specifically on the canal that runs through the middle of Key West. However, there is no high ground in the vicinity where a surge barrier can be tied in and seawalls/floodwalls and levees were screened from consideration. Without anything to tie a surge barrier into, constructing one would be ineffective because storm surge would rise over the shoreline next to the inlet and flood the structures there even if the canal itself was blocked off with a surge barrier. Surge barriers were screened from further consideration.

Small Scale Floodwalls (Ring Walls): Although not realistic for all of the structures in the Florida Keys, ring walls were considered for critical infrastructure. However, engineering analysis showed that due to the limestone geology in the Keys, T-walls would be required instead of I-walls. T-walls are much more expensive to construct than I-walls and would not be economically justified. Ring walls were screened from further consideration.

Beachfill and Dunes: Beachfill was initially considered across the entire study area. The PDT looked specifically at areas that have existing sandy shoreline, which would suggest that beachfill is a sustainable measure there. Preliminary structure damage was also incorporated in the consideration of beachfill areas and only areas where structures were experiencing damage were considered. Private property also had to be considered. In some of the areas considered for beachfill, the beaches are privately owned and do not have public access amenities that are required for USACE to recommend a beachfill project, such as established beach access locations and adequate public parking facilities. After reviewing potential sites across the study area, the only area identified as a location where beachfill would be feasible considering these engineering, economic, and public access criteria is the southern shoreline of Key West, from the edge of Naval Air Station Truman Annex eastward to the groin at the end of Smathers Beach. This segment of shoreline does not include the shoreline in front of the Key West Airport. This is because there appears to be a large longshore sediment transport in the area that would supply sand naturally in front of the Key West Airport. To sustain the artificial beach, approximately nine coastal structures (groins, breakwaters, etc.) would be needed. The existing

bulkhead itself already should function as a shoreline stabilization project in this location. The width of the road and bulkhead will dissipate the wave energy before it gets to the airport. Beaches in front of seawalls tend to erode a faster rate than shoreline with just beaches, especially in areas where there are a large longshore sediment transport, due to the wave reflection at walls reflecting back on the beaches. In some areas like this, the anticipated time of renourishment is cut in half (in other words effectively doubling the sand renourishment required). In summary, constructing a beach in front of the seawall near the airport in Key West would be extremely costly and not reduce damage to the airport beyond the existing seawall's function.

Additionally, while the stretch of shoreline from edge of Naval Air Station Truman Annex eastward to the groin at the end of Smathers Beach did meet the initial three screening criteria, additional analysis was completed on this area to assess the economic feasibility due to the high cost of beachfill in the Florida Keys. When the PDT's engineering team contacted the Jacksonville District to get data needed to develop an initial cost estimate for beachfill in the study area, they were informed that there was just a beachfill project completed in Key West in 2018 (non-USACE/Federal). The material for this project had to be truck hauled from an upland sand source near Lake Okeechobee and the cost per cubic yard of beach quality sand was $76 per cubic yard (CY). This is significantly higher than the cost of beach quality sand in the northeast, so alternative sources of sand were researched to ensure that there are not less costly options. After additional research, no additional sources of sand were found that had the quantity and/or quality of sand needed for less than $76/CY. Other sources studied included using dredge material from Key West Harbor and other navigation channels in the study area vicinity and barging sand from an offshore BOEM borrow site in the Gulf of Mexico.

Because $76/CY is so much higher than the cost of beachfill projects in other coastal locations, the team completed an initial cost benefit analysis of beachfill in the area identified for Key West. The goal of this analysis was to use existing information to discern whether beachfill would be an economically justified measure before the study progressed further. A benefit to cost ratio (BCR) was calculated using the structure damage generated from a GIS-based tool that utilized the structure inventory for the study and the estimated cost of constructing the minimum beach berm width required to provide coastal storm risk in the area of Key West identified. Some of the assumptions/details of this analysis include:

- Benefits were estimated using a GIS-based tool that utilizes the structure inventory and FEMA water levels for various storm event frequencies (10, 50, 100, and 500 year) to estimate damages over the 50 year period of analysis. The water levels used included assumptions for sea level rise. Damages are calculated for each structure in the inventory throughout the 50 year period of analysis for a total annualized damage amount on a structure by structure basis.
- For the purposes of this analysis, it was assumed that structures within 1,000 feet of the beach would experience reduced damage from the beach. This assumption is based on the normal study area size that is used when the USACE beachfill economic model, BeachFX is run for CSRM studies to assess damages and economic benefit. It is also

important to note that it was assumed that 100% if the damage to those structures would be prevented/reduced by the beach. The total annual damage for the 1,224 structures within the 1,000 foot buffer area is $4M.

- Cost of beachfill was calculated for a 50ft wide berm (no dune) at $76/CY. Initial construction was estimated at $176M. It was estimated that the beach would require four sand renourishments over the 50 year period of analysis. Each of these renourishments would cost $62M. These estimated costs were then annualized over the 50 year period so they could be compared to the structure damage. The average annual cost of beachfill is $32M.
- When the annual benefits and costs are compared for the beachfill area, the resulting BCR is 0.1. USACE policy requires projects to have a BCR or 1.0 or greater, so this measure is not viable for further consideration.

It is important to acknowledge that this assessment was preliminary and that assumptions were made which may affect the values used for costs and benefits. On the cost side, the team erred on keeping the costs as low as possible by designing the smallest berm deemed acceptable for the area. If this measure had made it past the screening process and was run through engineering and economic models, it is likely that the berm size could increase, thus increasing the cost. It is also possible that there would be additional structures such as breakwaters needed to retain the sand in the area identified, which would also increase the cost. On the benefits side, the structure inventory was complete, but the assessed values were used for this analysis, when normally in USACE economic models, the depreciated replacement value of the structure is used to calculate benefits. The assessed value is always higher than the depreciated value of a structure. Also, it is not realistic to assume that 100% of the damage to 100% of the structures in the model area would be reduced/prevented by the beachfill measure. Lastly, recreation benefits can be captured for beachfill projects, but cannot exceed 50% of the non-recreational benefits. Even if it was assumed that the maximum recreation benefit could be captured for this beachfill, the additional $2M would not have a meaningful effect on the BCR. In summary, the costs used in this analysis were most likely lower and the benefits were higher than they would be if this measure were to be carried forward and evaluated with USACE engineering and economic models. The fact that even with these assumptions the costs still unarguably outweigh the benefits further supports the rationale to screen out beachfill from further consideration in this study.

1.2 NATURAL AND NATURE BASED FEATURES SCREENING

NNBF were screened initially based on the three criteria used for all measures and mangrove restoration and living shoreline were carried forward for further analysis. After the first screening, the PDT thought that these two measures could possibly be economically justified based on NED benefits, especially when combined with the structural measures (revetment along U.S. Route 1), but would not likely be economically justified if they were to be implemented as standalone features and were not collocated with a structural measure. However, once the PDT searched for locations where the habitat was suitable for these NNBFs, it was determined that in the locations where there may be site conditions necessary for mangrove or living shoreline to thrive, there would be impacts to a different environmental

resource or habitat that would require mitigation. As it does not make sense to have to mitigate environmental impacts in order to incorporate natural features, the PDT screened NNBF from further consideration.

It is also important to note that, as mentioned in the structural measures screening, especially for the breakwater and U.S. Route 1 shoreline stabilization, the team determined that in-water impacts must be avoided in order for structural measures to be economically justified. The decision to not construct any feature in the water was necessary due to the high cost of mitigation for in water-impacts and the widespread nature of protected aquatic habitat in the study area. It is important to note that both mangrove restoration and living shorelines would be constructed at least partially, if not entirely, below MHW if they had been included in the TSP.

2 OTHER SOCIAL EFFECTS

The PDT evaluated the seven alternatives based on OSE metrics. The rating scheme used to rank the plans was based on the Institute for Water Resources' handbook for Applying Other Social Effects in Alternatives Analysis (2013). This method uses a -3 to 3 scale with -3 representing significant negative effects and 3 representing significant beneficial effects. Zero is negligible effects or no impact. The one and two rankings indicate minor and moderate effects in either the negative or positive direction. Per this IWR handbook methodology, the score is an assessment of the relative impact an alternative would have on a particular metric in relation to the without project condition which the same as the no action alternative (alternative 8). The assessment is made from an overall planning perspective and does not necessarily reflect impacts to individuals or small groups. The description of each metric used in the OSE matrix are shown in Table 3. The results of the OSE analysis are shown in Table 4.

Table 3. OSE Metric Definitions

Factor	Metric	Description
Health and Safety	**Human Health**	Issues affecting a person's physical health (e.g., air quality, diseases) or mental health such as anxiety and stress (e.g., threat of flooding, transportation concerns, noise)
	Life Safety	Safety issues that could cause bodily harm to a person (e.g., flood waters, crime)
Economic Vitality	**Business Climate**	Issues affecting the ability of a community to retain and attract businesses
	Tourism Revenue	Issues affecting the tourism industry (e.g., visitation numbers, hospitality industry)
	Real Estate Values	Issues affecting the value of property and real estate
Social Connectedness	**Community Cohesion**	Issues affecting local social networks, including personal networks
	Local/Cultural Identity	Issues affecting sense of community, local, and/or cultural identify within a community (e.g., historical significance, cultural significance, how others see the area)

Factor	Metric	Description
Resiliency (4 USACE Resilience Principles)	**Prepare**	Considers measures that reduce risks or costs under conditions beyond those required by current conditions
	Absorb	Considers adding system component robustness, redundancy, and increased reliability
	Recover	Identifies cost effective measures that allow for rapid repair or function restoration of a project component or system
	Adapt	Identifies cost effective modifications that can be made to a project component or system that will maintain or improve future performance based on lessons learned from a specific loading condition or loadings associated with changed conditions
Environmental Justice	**Socially Vulnerable Populations**	Issues affecting socially vulnerable groups (e.g., low income, minority, elderly, children, disabled)
Recreation	**Recreational Opportunities**	Issues affecting access to, or availability of, recreational activities (e.g., parks, trails, water access)

Table 4. OSE Analysis

Factor	Metric	Alt 1 U.S. 1	Alt 2 Critical Infrastructure	Alt 3 Development Centers	Alt 4 Combo Alts 1+2	Alt 5 Combo Alts 1+3	Alt 6 Combo Alts 2+3	Alt 7 Combo Alts 1+2+3
Health and Safety	Human Health	1	3	3	3	3	3	3
	Life Safety	2	3	3	3	3	3	3
Economic Vitality	Business Climate	1	1	1	1	1	2	2
	Tourism Revenue	1	0	1	1	1	1	1
	Real Estate Values	0	0	1	0	1	1	1
Social Connectedness	Community Cohesion	0	0	1	0	1	2	2
	Local/Cultural Identity	0	1	1	1	1	1	1
Resiliency (4 USACE Resilience Principles)	Prepare	2	2	3	2	3	3	3
	Absorb	2	2	3	2	3	3	3
	Recover	2	2	3	2	3	3	3
	Adapt	1	1	2	2	2	2	3
Environmental Justice	Socially Vulnerable Populations	0	1	3	1	3	3	3
Recreation	Recreational Opportunities	-1	0	0	-1	0	0	-1
	Total Score	11	16	25	17	25	27	27