National Pollution Funds Center Final Decision

Claim Number and Name:	**N06008-OC01** – *DBL 152* Assessment and Compensatory Restoration Costs
Claimant:	National Oceanic and Atmospheric Administration (NOAA)
Claim Type:	NRDA, Upfront Restoration and Past Assessment Costs
Amount Requested:	$13,471,035.46
Offer Amount:	$4,839,407.50
Denied Amount:	$8,631,627.96
Determination Date:	February 8, 2021
NPFC Claims Manager:	[redacted]

This determination reconsiders the determination issued by the National Pollution Funds Center on June 2, 2020 for Claim N06008-OC01 DBL 152 Assessment and Compensatory Restoration Costs. This determination represents final agency action.

Summary of the Incident and Claim

On November 11, 2005, while transiting from Houston, Texas, to Tampa, Florida, the double-hulled Tank Barge *DBL 152*[1] struck the submerged remains of a pipeline service platform[2,3] approximately 32 miles south of Calcasieu Pass, Louisiana.[4] The cargo and ballast tanks of the barge, which carried approximately 119,000 barrels of #6 fuel oil, were punctured by the allision, and the barge began taking on water and discharging oil. Under direction of the Federal On-Scene Coordinator (FOSC), the barge was towed towards shore, where it grounded approximately 13 nautical miles northwest of the original allision in waters around 50 feet deep. After grounding, the barge continued to discharge oil and take on additional water and ultimately capsized on November 14, 2005. Most of the estimated 45,846 barrels of oil that discharged during the incident sank[5] to the bottom of the seafloor where it collected in pools and mats. Response personnel used diver-directed pumps to recover submerged oil until January 12, 2006. An estimated 2,355 barrels of oil were recovered by the divers, leaving approximately 43,491 barrels of oil in the environment unrecovered along the seafloor. K-Sea Operating Partnership LP was the owner and operator of *DBL 152* and acknowledged that they were the Responsible Party (RP) for the oil spill.[6]

[1] At the time of the incident, *DBL 152* was under tow by the tugboat *Rebel* as an integrated tug-barge unit

[2] The platform collapsed during Hurricane Rita

[3] The submerged platform was owned by Targa Midstream Limited Partnership. On December 10, 2007, the United States District Court for the Southern District of Texas found that Targa's negligence proximately caused 40% of the damages resulting from the oil spill.

[4] SITREP 1, MSO Port Arthur, 13011Z NOV 05

[5] The released oil had a low American Petroleum Institute gravity, which is a measure of how heavy or light a petroleum liquid is compared to water, and thus was classified as a "heavy" oil

[6] January 26, 2006 claim from K-Sea Operating Partnership LP to the National Pollution Funds Center for third-party defense and entitlement to limit of liability.

The National Oceanic and Atmospheric Administration (NOAA), the sole natural resource Trustee for this claim, conducted a natural resource damage assessment (NRDA) to determine the nature and extent of injuries resulting from the spill and the type and scale of restoration necessary to compensate for the injuries to natural resources. NOAA invited the RP to participate in a cooperative NRDA,[7] the RP accepted,[8] and the two parties developed a set of mutually agreeable guiding principles for conducting the NRDA.[9] The RP participated cooperatively in the NRDA throughout the response and preassessment.[10] Ultimately, the National Pollution Funds Center (NPFC) determined that the RP was entitled to a limitation of liability[11] prior to NOAA moving forward with restoration planning,[12] which ended the RP's interest and participation in the NRDA.[13] Through their assessment efforts, NOAA estimated that the equivalent of 450 acres of offshore benthic habitat suffered 100% service loss for two years before onset of recovery as a result of oil discharged from the incident. After evaluating a number of alternatives, NOAA selected a compensatory restoration project to compensate the public for the interim loss of the benthic habitat.

On June 26, 2017,[14] NOAA presented the NPFC with a claim that totaled $13,471,035.46. The claimed costs included $306,465.91 for past assessment costs and $13,164,569.55 to implement the compensatory restoration project detailed in the "Final Damage Assessment and Restoration Plan/Environmental Assessment for the Tank Barge DBL 152 Oil Spill" (the Plan). NOAA withdrew their claim on September 5, 2018 to further evaluate parameter estimates in the assessment.[15]

The NOAA resubmitted its claim for the same sum certain value on June 24, 2019 (the Claim). In this Claim, NOAA adjusted the geographic and temporal extent of the injury (the equivalent of 705 acres suffering 100% service loss with onset of recovery in eight months), but ultimately determined the same level of restoration to compensate for the injury.

The NPFC reviewed the Claim submitted by NOAA for past assessment costs and future costs to implement its compensatory restoration project for the *DBL 152* incident in accordance with OPA (33 U.S.C. §2701 et seq.) and associated OSLTF Claims Regulations (33 C.F.R. Part 136). The NPFC reviewed the data submitted by NOAA, an independent report submitted by David Evans and Associates, and considered various conversations between NOAA and NPFC staff. Through its determination,[16] the NPFC approved past assessment costs of $306,465.91 incurred by NOAA and denied claimed costs in the amount of $13,164,569.56 for future restoration

[7] Letter from NOAA to RP, dated December 7, 2006
[8] Letter from RP to NOAA, dated January 22, 2007
[9] Formalized in a letter from RP to NOAA, dated May 10, 2007
[10] Plan, page 7
[11] See February 12, 2009, determination by the NPFC stating that K-Sea Operating Partnership LP is entitled to limit their liability to the amount provided under 33 U.S.C. § 2704(a).
[12] Notice of Intent to Conduct Restoration Planning was published on April 8, 2009.
[13] Memo from Cardno ENTRIX to West of England Ship Owners Mutual Insurance Association, dated April 15, 2013, "Comments on the Draft Damage Assessment and Restoration Plan/Environmental Assessment for the Tank Barge DBL 152 Oil Spill"
[14] Email from NOAA to NPFC, dated June 26, 2017
[15] Email letter from NOAA to NPFC, dated September 5, 2018
[16] NPFC Determination for Claim N06008-OC01 – DBL 152 Assessment and Compenstory Restoration Costs. June 2, 12020

implementation on the grounds that 100% loss for eight months for all heavily and moderately oiled areas and the scaling metric were not supported by evidence, and the monitoring costs were not clearly clarified.

On July 1, 2020 NOAA submitted a Request for Reconsideration of the Claim, providing their legal grounds for the relief requested.[17] On July 29, 2020 NOAA requested a copy of technical report prepared for NPFC by David Evans and Associates,[18] and requested an opportunity to review the report and submit additional support for the relief requested. On September 25, 2020 NOAA submitted an amended request, clarifying their intention that the amended request serve as the basis for NPFC's reconsideration of the claim, leaving aspects of the previously submitted basis for future discussion outside the context of this Claim. In its amended request, NOAA presents a general argument regarding the NRDA process and the deference that should be afforded the trustees, along with specific technical arguments, and finally, a request for the NPFC pay the claim in full or provide equitable compensation.

Claimant Eligibility

Federal natural resource trustees are designated by the President, pursuant to OPA (33 U.S.C. §2706 (b)(2)), with responsibility to assess damages to natural resources under their trusteeship and develop and implement plans to restore, rehabilitate, replace, or acquire the equivalent of those injured natural resources. 33 U.S.C. §§2706(c)(1)(A) and (C). Pursuant to 33 C.F.R. §136.207, natural resource trustees may present claims to the Oil Spill Liability Trust Fund (OSLTF or the Fund) for uncompensated natural resource damages (NRD). 33 U.S.C. §2712(a)(4). The measure of damages included the cost of restoring, rehabilitating, replacing or acquiring the equivalent of the damages natural resources, the diminution in value of those resources pending restoration, and the reasonable cost of assessing those damages. 33 U.S.C. 2706 (d)(1).

The Claim was submitted by NOAA. NOAA, under the authority of the Secretary of Commerce, is the federal natural resource trustee pursuant to the President's designation of federal trustees under OPA, Executive Order 12777 (56 Fed. Reg. 54757, October 22, 1991), and Subpart G of the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. §300.600) and Section 1006(b)(2) of OPA. 33 U.S.C. §2706(b)(2) who shall act on behalf of the public as trustees for natural resources under this Act.

Jurisdictional Information

Claims to the NPFC must arise from an incident as defined by OPA. 33 U.S.C. §2701 *et seq*. To be covered, the incident must involve a discharge, or a substantial threat of discharge, of oil from a vessel or facility into navigable waters of the United States after August 18, 1990. Based on information provided by NOAA and the response documentation[19,20] summarized above, this incident resulted from the discharge of oil from a vessel into the federal waters of the Gulf of

[17] Letter from NOAA to NPFC Re: Request for Reconsideration of Claim N06008-OC01 Oil Spill Assesment and Restoration Costs, July 1, 2020
[18] David Evans and Associates. 2020. DBL 152 Incident: Analysis of the Trustee, Technical Review (DEA Report)
[19] SITREP 1, MSO Port Arthur, 13011Z NOV 05
[20] In total, there were seventy-two SITREPS issued for the incident.

Mexico that began on or about November 11, 2005. The NPFC therefore finds that this oil spill is an incident as defined by OPA.

General Claim Requirements

Pursuant to 33 U.S.C. § 2713(e), the President promulgated regulations for the presentation, filing, processing, settlement, and adjudication of claims against the Fund. The Claims Regulations are found at 33 C.F.R. Part 136.

The NPFC received NOAA's NRD claim on June 24, 2019. NOAA presented a sum certain claim in writing to the Director, NPFC, and the claim included: an assessment and restoration plan[21] and other claim materials[22] that describe: the injuries to natural resources observed by the Trustee; assessment and restoration planning activities conducted by the Trustee; restoration project methods and project milestones; and level of effort, timeframe, and cost estimates for contractors and agency personnel.

Claims to the Fund must be presented to the NPFC within three years after the date on which the injury and its connection with the incident in question were reasonably discoverable with the exercise of due care, or within three years from the date of completion of the natural resource damage assessment under OPA (33 U.S.C. §2706(e)), whichever is later. 33 U.S.C. §2712(h)(2), 33 C.F.R. §136.101(a)(1)(ii). The Plan was finalized in June 2016, with official notice of its completion made public on July 11, 2016.[23] The Trustees submitted this claim within the period of limitations.

As noted above, the OSLTF is available to pay claims for uncompensated removal costs and damages. 33 U.S.C. §2712(a)(4). Covered damages include NRD, 33 U.S.C. §2702(b)(2)(A), which are for injury to, destruction of, loss of, or loss of use of natural resources, including the reasonable costs to assess those damages. 33 U.S.C. §2706(d)(1)(C). Costs are determined with respect to plans adopted under 33 U.S.C. §2706(d)(2) that are developed and implemented after adequate public notice, opportunity for a hearing, and consideration of all public comments. 33 U.S.C. §2706(c)(5). NOAA stated that the Plan that forms the basis of this claim was made available for public review on their website from March 18, 2013 through April 15, 2013. NOAA provided copies of the comments received in Appendix C of the Plan and NOAA's responses to those comments in Appendix B of the Plan.

Claim Presentment to the Responsible Party

With certain exceptions, claims to the NPFC for damages must be presented first to the RP. 33 U.S.C. §2713(a). If a claim is presented in accordance with §2713(a) and is not settled by payment by any person within 90 days after the date upon which the claim was presented, the

[21] The plan relies on literature and results from other incidents to support their injury assessment and restoration planning determinations.

[22] Additional material included, but were not limited to, revised assessment methodology from the Plan and justification, cost documentation to support past costs, detailed budgets to support future costs, and past RP communications.

[23] https://www.federalregister.gov/documents/2016/07/11/2016-16357/final-damage-assessment-and-restoration-plan-and-environmental-assessment-for-the-tb-DBL 152-oil

claimant may elect to commence an action in court or present the claim to the OSLTF. 33 U.S.C. §2713(c)(2).

In this case the NPFC determined that the RP[24] and their guarantor were entitled to *DBL 152*'s statutory limitation of liability of $11,689,200 and had no further liability for removal costs and damages. 33 U.S.C. 2704(a)(1). As a result, NOAA was not required to present this claim to the RP prior to presenting it to the Fund.

Time Limitations for Requests for Reconsideration

The Director, NPFC, upon written request of the claimant will reconsider a denied claim if presented with the request within 60 days after the date the denial was mailed to the claimant or within 30 days after receipt of the denial by the claimant, whichever date is earlier.[25] The determination was electronically mailed on June 2, 2020. The written request for reconsideration was received on July 1, 2020 within the time limitations for a request for reconsideration.[26]

Claimant's Burden of Proof

Trustees bear the burden of providing all evidence, information and documentation deemed necessary by the Director, NPFC, to support the claim. 33 C.F.R. §136.105(a). To satisfy this requirement, the Trustee claimant must submit the plan which forms the basis of the claim, along with sufficient supporting information, including documented costs and cost estimates, so the NPFC can determine that the activities and associated costs are reasonable and appropriate. 33 C.F.R. §136.209(a) and (b). NOAA provided supporting information, as described, along with additional information per six specific requests from NPFC.[27] NOAA also provided support for the technical arguments included in their request for reconsideration.[28]

The NPFC acts as the fact-finder during the adjudication of claims. In this role, the NPFC considers all relevant evidence and weighs its probative value when adjudicating a claim. The NPFC is not bound by the findings or conclusions reached by other entities. If there is conflicting evidence in the record, the NPFC makes a determination as to what evidence is more credible or deserves greater weight, and finds facts based on the preponderance of the credible evidence. In its adjudication, the NPFC considered all of the documentation provided by NOAA, an NPFC contracted third party analysis of certain aspects of the Claim, [29] and independently conducted fact finding.

In NOAA's September 25, 2020, submittal of additional technical information supporting its request for reconsideration, NOAA reiterated the challenges associated with ephemeral data

[24] While the NPFC recognizes that the United States District Court for the Southern District of Texas found that Targa's negligence proximately caused 40% of the damages resulting from incident, under OPA the owner and/or operator of the vessel of the discharged oil is the Responsible Party.
[25] 33 C.F.R. §136.115(d)
[26] NOAA also provided their revised basis for request within the agreed time period.
[27] NPFC requested additional information on various aspects of the Claim on: August 24, 2017; May 11, 2018; June 20, 2018; September 6, 2019; November 6, 2019; November 29, 2019; and via teleconference December 13, 2019 and February 7, 2020
[28] Request for Reconsideration. September 25, 2020. 6 pp.
[29] DEA Report

collection and assessment design in the context of marine spills generally and specifically in regard to this incident and the additional challenges associated with a non-floating oil. NOAA also discussed the decision-making involved toward conducting a cost effective cooperative assessment and the resulting restoration plan. Accordingly, NOAA appealed to the NPFC to consider the Damage Assessment and Restoration Plan with some degree of deference and understanding of the challenges and limitations faced by trustees and the complexities of actually working in the real world circumstances of marine oil spills. The NPFC considers all information submitted by trustees and weighs evidence and estimates calculated by the trustees based on the available data and circumstances in each case. The NPFC bases its decisions on the preponderance of evidence provided by data submitted by the trustees, other available data, and data collected by the NPFC.

In this case NOAA relied on, and the NPFC considered, data collected during the response and long term monitoring activities and the body of available literature. This is discussed further below.

Injury Determination and Quantification

Following the incident, response personnel conducted extensive operations to locate, track, characterize, and recover the discharged oil. Because the oil sank to the seafloor at depths of 50 feet, the response relied on a combination of human divers, V-SORS,[30] stationary vertical snares, acoustic remote sensing, and remotely operated vehicles to locate and characterize movement of the oil. Long-term monitoring of oil on the seafloor continued through January of 2007, or 14 months from the date of the spill.[31] Due to the logistical and safety concerns, and the costs associated with the depth of the seafloor and the distance offshore, NOAA limited the amount of additional data collection and observation efforts for NRDA-specific purposes.[32] Further, NOAA states that the large overall area of the oil field and mobile nature of the oil pools provided a significant obstacle to comprehensive site-specific assessment activities.[33]

Based on the evidence of persistent thick oil[34] on the seafloor, NOAA determined that there was injury to benthic resources resulting from the *DBL 152* incident and further described that "injury to benthic invertebrates and potential injuries to demersal fishes, pelagic fishes, and marine mammals resulted from the released oil from smothering and coating of benthic resources and ingestion by animals that feed on benthic resources and demersal fishes in the affected area."[35]

[30] V-SORS are chain weighted snares that are dragged along the seafloor by a vessel. The vessel navigates via GPS under prescribed transects to capture location information.

[31] The response conducted 8 surveys from January through June 2006, which assessed the entire oil field. From September 2006 through January 2007, the response conducted 5 additional surveys that focused on one patch of heavy oil.

[32] Plan, Page 8.

[33] Plan, Page 28.

[34] The USCG Marine Safety Lab (MSL) fingerprinted weathered oil samples from VSORS-Light snare and "confirmed that oil in the vicinity of the bolus originated from the DBL 152." (8 Feb 07 Meeting Minutes-FINAL).

[35] Plan, page 24-25

NOAA utilized some of the available data about oil distribution, thickness, fate and transport, and chemical composition to estimate injuries to benthic resources resulting from the incident.

NOAA employed the Habitat Equivalency Analysis (HEA), to quantify the injury and scale of restoration needed to compensate for the injury. The injury quantification relied on incident-specific observations of the oil behavior and literature to quantify the amount of lost benthic services resulting from the incident.[36] Injury parameters incorporated in the HEA include: the geographic extent of habitat service loss (area), the degree of habitat service loss (percent), and the rate of recovery (time).

HEA is a commonly used and reliable technique to quantify injuries and scale restoration for comparable habitats.[37] HEA has been routinely used to quantify habitat level injuries, and sufficient data exists to provide the HEA with inputs that could result in a reasonably supported injury determination for the *DBL 152* incident. While the NPFC generally approves of the use of the HEA methodology to quantify the injury for the incident, the NPFC raised concerns regarding the inputs NOAA used in their 2012 HEA to calculate 1,475 Discounted Service Acre Years (DSAYs) of injury included in their Plan.[38] NOAA subsequently withdrew their claim to allow for further review and consideration of the model inputs.[39] The resubmitted claim is predicated on a 2019 HEA which employs a modified discounting methodology and incorporates revised area of injury and rate of recovery inputs.

The NPFC evaluated the evidence supporting the inputs for the 2012 HEA as presented in the Plan and the revised 2019 HEA which forms the basis for the Claim to determine whether the calculated DSAYs of injury are supported.

	2012 HEA	2019 HEA
Degree of Injury	100% service loss associated with oiling ≥ ½ inch thick	100% service loss associated with moderate/heavy oiling, > ⅛ inch thick
Area of Injury	450 acres	705 acres
Time to Onset of Recovery	2 years	8 months
Rate of Recovery upon Onset	3 year linear	3 year linear
Injury in DSAYs	1,475	1,436

SERVICE LOSS OF 100% TO THE IMPACTED BENTHIC AREAS

NOAA explained that "oil on the seafloor in sufficient quantities to form a film or layer of oil across the surface severely affects, amongst other things, animals on and beneath the surface, fishes and other animals that may feed on seafloor organisms or occupy areas on or near the

[36] Plan, page 26
[37] NOAA.1995. Habitat Equivalency Analysis: An overview, Damage Assessment and Restoration Program, March 21, 1995 (revised October 4, 2000)
[38] NPFC requests for Additional Information August 24, 2017; May 11, 2018; and June 20, 2018
[39] Claim. Page 5

bottom, and movement of benthic organisms."[40] Considering the heavy viscous nature of the discharged oil, NOAA estimated that the oil rendered the benthic habitat effectively unusable and determined benthic habitat service loss of 100%. Though NOAA never defined a specific thickness of oil associated with 100% service loss, the 2012 HEA is predicated on a thickness of ½ inch[41] and the 2019 HEA is predicated on areas defined as having heavy or moderate oiling, estimated as oiling greater than ⅛ inch (3mm).[42] Given the lack of onsite ecological studies to support their determination of 100% service loss, the NPFC requested additional information from previous incidents and/or literature to support applying 100% service loss to the oiled areas.[43]

NOAA first responded that previous information from literature and/or incidents was minimal because "The *DBL 152* oil spill was characterized by unique facts and circumstances, in which oil was released into a relatively shallow offshore, open water environment, and the majority of discharged oil was denser than seawater and sank to the seafloor upon release. As a result, there are few examples of similar pathways, exposure, and injuries to those described in the DARP/EA".[44] NOAA did provide several literature references that documented significant injuries to benthic resources from submerged oil resulting from spills similar to the *DBL 152* incident, including the *Amoco Cadiz*,[45] *Exxon Valdez*,[46] *North Cape*,[47] and *Florida*[48] incidents. NOAA provided summaries of these literature references and highlighted that significant, or in some cases, complete impairment of all or a portion of the benthic community occurred following these incidents.[49] Furthermore, NOAA described how their assessment of benthic injury was conservatively approached compared to the injuries detailed in the literature, which documented longer-term impacts to benthic resources, such as benthic community shifts, that could last for decades.[50,51]

Additionally, while NOAA did not have site specific observations of ecological service injuries, they did make use of site specific data to support the pathway of exposure – smothering. Specifically, NOAA reviewed videos of oil on the seafloor and observed its behavior and composition and how it covered the seafloor and benthic biota in the videos. NOAA also reviewed the results of sediment sampling conducted by the RP in unoiled areas near the incident. From this sampling, NOAA was able to identify benthic species present in the area.

[40] Plan, page 28
[41] Plan, page 27
[42] Claim, page 8
[43] NPFC requests for Additional Information on August 24, 2017; May 11, 2018; and June 20, 2018.
[44] Email from NOAA to NPFC, dated December 5, 2017
[45] Dauvin, J. C. 1998. The fine sand *Abra alba* community of the Bay of Morlaix twenty years after the *Amoco Cadiz* oil spill. Marine Pollution Bulletin 36: 669-676.
[46] Jewett, S. C., T. A. Dean, R. O. Smith, and A. L. Blanchard. 1999. *Exxon Valdez* oil spill: Impacts and recovery in the soft-bottom benthic community in and adjacent to eelgrass beds. Marine Ecology Progress Series 185: 59-83.
[47] National Research Council. 2003. Oil in the sea III: Inputs, Fates, and Effects. Prepared for the Ocean Studies Board and Marine Board Divisions of Earth and Life Studies and Transportation Research Board. The National Academies Press, Washington, D.C. 265 pp.
[48] Sanders, H. L., J. F. Grassle, G. R. Hampson, L. S. Morse, S. Garner- Price, and C. C. Jones. 1980. Anatomy of an oil spill: long-term effects from the grounding of the barge *Florida* off West Falmouth, Massachusetts. Journal of Marine Research 38:265-380.
[49] Email from NOAA to NPFC, dated May 29, 2018
[50] AI from NOAA dated August 16, 2018
[51] As opposed to the 5 years to reach full recovery in 2012 HEA and 3 years to reach full recovery in 2019 HEA

NOAA conducted literature reviews to evaluate the feeding/movement strategies and life histories of the fauna identified. Based on their review of faunal behavior of species present in the impacted areas, combined with their observations of oil in the impacted area, NOAA determined all benthic fauna exposed to a film or layer of oil on the seafloor would have been directly affected by physical fouling or ingestion.[52]

An extensive literature review, which included the studies referenced by NOAA along with numerous other studies, paints a less consistent picture of the effects of oiling on benthic resources, but generally supports a decline in the abundance, diversity, and/or health of benthic macro and meiofauna associated with benthic oiling.[53] In the absence of site specific evidence to the contrary, and in light of the variable results reflected in the literature, the NPFC accepts NOAA's assessment that 100% service loss occurred over some area of oiling. The relationship of 100% service loss to the defined area of oiling is considered later in the determination.

AREA OF INJURY/SEAFLOOR COVERAGE OF OIL

NOAA used different methods to estimate the geographic area associated with 100% service loss. In its Plan and initial claim, NOAA used the information gathered during the response operations to construct an outer perimeter where oil was located and utilized mapping software to calculate a total area of 45,000 acres of *potentially* impacted area. Considering that lingering oil was dispersed by ocean movement across a large area, only a small portion of the total 45,000 acres was actually oiled at any given time. To determine the area of oiling, NOAA estimated how many acres that the 1,826,622 gallons of unrecovered oil would cover, given a ½ inch thick[54] layer of oil, which resulted in an estimate of 0.3% of the 45,000 acres (135 oiled acres). NOAA then adjusted the 0.3% estimate of oiled area up to 1% (450 oiled acres) because oiled areas usually had estimated covers higher than 1%[55] and was consistent with observations from video imagery that indicated percent coverage across the oil field was approximately 1%.[56]

The NPFC requested NOAA provide the reasonableness of "rounding" from 0.3% to 1% given that: (1) Since the average was being applied to the entire 45,000 acres, not just the oiled areas, the oiled areas would be naturally expected to have higher than 1% coverage[57] to balance out the vast majority of the area[58] that was unoiled; and (2) When determining average oil thickness, NOAA chose the lowest observed oil thickness[59] to account for bias associated with response operations occurring in the most heavily oiled areas[60] – in effect, NOAA used response data as support to lower one variable (oil thickness of ½ inches) because the response data was biased

[52] Claim, pages 9-10
[53] DEA Report, page 10, discusses the results of 16 studies including those referenced by NOAA along with benthic impact studies following the *Tsesis* spill, the *Deepwater Horizon* spill, the *Haven* spill and the *Braer* spill.
[54] NOAA adopted the lowest observed oil thickness from divers because response operations were focused on heavily oiled areas.
[55] Based on review of video imagery from the response
[56] Plan, page 28
[57] Especially, because, as stated by NOAA in the Plan, the response observations were biased towards heavily oiled areas
[58] Even using NOAA's 1% oiling coverage determination, that leaves 99% of the 45,000 acres unoiled.
[59] According to the Plan, observations of oil thickness ranged from .5 to 2 inches, with most observations between 1 and 1.5 inches.
[60] Plan, page 28

towards heavily oiled areas, but then used the same "biased" response data to support increasing another variable (oil coverage from 0.3% to 1%).[61] Though NOAA provided a variety of explanations for adjusting the values,[62] NOAA ultimately withdrew the claim to further review and consider model inputs.

In NOAA's resubmitted claim, NOAA evaluated and presented several additional analytical methods to determine the area of injury before settling on kriging, a geostatistical interpolation procedure, to derive a revised area of 705 acres of moderate and heavy oiling (areas for which NOAA associated with 100% service loss).[63] To apply the new methods, NOAA combined the response and long-term monitoring (LTM) observational data[64] into a single data set consisting of 904 points, then standardized the observations into five oiling categories (no oiling, very light oiling, light oiling, moderate oiling, heavy oiling), including the transect-based VSORS observations which were converted from lines to points with the same categories applied.[65] While the standardization of the data facilitated comparisons between all response and LTM observations, aggregating all the observations into a single data set removed the valuable temporal component of the observational data.

NOAA did not address why the methodology in the Plan and original claim was insufficient and warranted a completely new and much more rigorous method for estimating area of injury applied in the resubmitted claim. The original methodology matched the precision of the data, but suffered from the application of "rounding" that was inconsistent with the mass-balance approach. The kriging method in the Claim, by contrast, is a rigorous, geostatistical analysis which is an imperfect fit for the generalized and spatially biased data set.[66] The NPFC acceptsNOAA's application of the results of the kriging with regard to the calculated areas of the different categories of oiling, but not length of time of oiling over those same areas or "thickness" of oil represented by those areas[67] as the methodology precludes those determinations.

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[61] Email from NPFC to NOAA, date June, 2018

[62] Email from NOAA to NPFC, dated August 16, 2018

[63] Claim, pages 5-8

[64] NOAA clarified in the February 7, 2020 teleconference that the data used was a subset of the total data and reflected that data which had undergone Quality Assurance/Quality Control

[65] NOAA Internal Memorandum, Deliverable from the Spatial Data Branch to the DBL 152 Case Team, June 12, 2019

[66] From DEA Report, pages 6-9. Kriging is a geostatistical interpolation method that was originally used in mining geology and is now commonly used for specific geodetic, topographic, and environmental mapping applications. The kriging procedure requires the construction of a mathematical model (the variogram) to describe the spatial correlation among data points. Kriging uses this variogram to predict values for unsampled locations. Kriging is a very robust method, however the interpolation results and the underlying variogram are highly dependent on adequate, unbiased sampling efforts with suitable spatial configurations and supports. In contrast, the results of an exploratory spatial data analysis (ESDA) of the standardized data set reveal a severe spatiotemporal clustering of the data points. This is consistent with the known sampling bias during response and LTM operations, with preferential sampling and tracking of locations with a higher degree of oiling. The kriging process also requires a fundamental assumption that the input data are normally distributed, however the ESDA results show a pronounced positive skew in the standardized data set. This sampling bias, in addition to the aggregation of response and LTM time steps, renders kriging an unsuitable interpolation method and results in a fundamentally flawed interpolation of the oiling contour.

[67] Though NOAA applied a mass-balance equation to estimate the thickness of oil associated with moderate and heavily oiled areas in the interpolated map, the presence of multiple time series data prevents the application of a mass-balance equation as the same oil is measured multiple times.

It is reasonable to conclude that some number of acres of seafloor experienced oiling "in sufficient quantities to form a film or layer of oil across the surface." The "bolus",[68] for example, persisted as heavy and very heavy oiling[69] at least until September 2006 (10 months), though it must be acknowledged that even areas characterized by "very heavy oiling" do not have uniform or continuous coverage of oil. Visual inspection of areas classified as having heavy and very heavy oiling during long-term monitoring operations were observed to have only 5-60% coverage.[70] Surveys throughout the response period describe similar discontinuity of the oil. NOAA applies 100% service loss to this discontinuity which overestimates the injury. However, given the challenges of monitoring[71] and the elimination of certain monitoring data[72] used by NOAA to generate the interpolated area of oiling, it is also reasonable to conclude that although the 705 acres includes areas which did not experience 100% service loss, the 705 acres also excludes areas that experienced service losses. As such, the NPFC finds that 705 acres of 100% service loss is a supported input to the HEA.

PERIOD OF INJURY AND TIME TO RECOVERY

NOAA also applied different periods of injury depending on the method used to estimate area of injury. In the Plan and initial claim, NOAA determined that the 100% loss of ecological services of the oiled benthic areas lasted for two years because "discharged oil persisted and was observed on the bottom of the ocean for about two years after the Incident."[73]

The NPFC requested NOAA provide their basis for determining that oil persisted for two years in quantities sufficient to cause 100% service loss, especially considering that long-term monitoring by the response indicated that even the heaviest oiling had dissipated to "light" or "very-light" by January 2007.[74] Though NOAA provided various rationale for the two years of service loss before initiation of recovery in support of the Plan, NOAA adjusted the period of injury and time to recovery in the Claim to reflect "a three-year linear recovery based on oil weathering in the environment beginning on the date of the incident," explaining that though oil discharged during the incident was present on the seafloor of the Gulf of Mexico for more than a year, response and LTM data showed oil weathered to some degree during the first year following the release.[75] NOAA specifically cited chemical analysis of weathered oil collected

[68] The bolus was a discrete pocket of oil, the movement and dissipation of which was tracked during the Long Term Monitoring period.

[69] Characterization of degree of oil is relative to degree of oil coverage of the snares.

[70] Section 4.4 Long-Term Monitoring Phase III of the Environmental Unit Report, estimates of percent cover associated with the two "very heavy" V-SORS Light transects in mid-September range from 23-60%[70] with no significant amounts of oil observed in the vicinity of "heavy" or "moderate" V-SORS Light transects. The same report described V-SORS Light surveys in late-September which delineated a 20 acre area of "heavy and very heavy oil" as containing a cumulative area of only 1.02-1.21 acres of seafloor covered by oil (or ~5%).

[71] Environmental Unit Report Appendices K, L, and M discuss some of the challenges (such as equipment theft and weather) weather impacting data collection and describe the general goal of focusing efforts on the leading of oiling and bolus tracking.

[72] In NOAA's request for reconsideration, NOAA describes having used "validated response data" and that they did not use any data from repeated sampling locations

[73] Plan, page 29

[74] Email from NPFC to NOAA, dated June 20, 2018

[75] Claim, page 8

during LTM in July 2006 which suggested that the "bolus" was likely a fractionated part of the original mixed heavy oil load.

The NPFC requested clarification regarding the timing of the onset of recovery described in the Claim, interpreting that NOAA intended that recovery began immediately in contrast to the 2019 HEA calculations[76] which incorporate recovery beginning in July 2006, eight months following the incident.[77] NOAA clarified that the narrative asserts *weathering* beginning at the time of the incident, not *recovery*.[78] NOAA cited communications with the NPFC in which the parties agreed that long-term monitoring results supported the presence of thick oil (that associated with the 100% injury metric) until July 2006 – the time of onset of recovery used in the 2019 HEA and described in the Claim. NOAA further clarified that the geospatial data set used did not include repeat sampling sites, therefore they applied the full time period over which the data were collected as representative of the time period for which oil was present.[79]

As previously described, the data set used for the kriging interpolation included in the resubmitted claim was a combination of time series data (e.g., the temporal dimension was "flattened" to produce a map of the total area of oiling over the fourteen month monitoring period). Because the time series data were collapsed in this way, an eight month injury period applied to the total acreage represents oil persisting for eight months across the entirety of the 705 acres in thicknesses sufficient to cause 100% service loss.[80] This is an appropriate calculation if, once a location was oiled, oil persisted in that location for eight months in a sufficiently thick layer to delay the onset of recovery.[81]

The NPFC reviewed the response and LTM data[82] and found that the monitoring data do not support eight months of persistence in locations that were sampled repeatedly. As early as December 1, 2005, Situation Reports describe divers not finding oil in previously oiled areas, and that snare sampling indicated the oil was moving along the bottom.[83] Long term monitoring results similarly support movement of the oil field rather than simply an expansion of the oil field. By example, a regularly monitored location (represented by grid coordinates K59-K63) first showed oiling as heavy in mid-February 2006, continued to have heavy oiling in mid-March, declined to very light by the end of March, and was still at very light in mid-April. Similarly, and likely representing movement of the same patch of oil, an area to the northwest (coordinates J64-J68) first showed oiling as moderate to heavy at the end of March, moderate in mid-April, and light to very light in mid-June. Even EE2a (a Long-Term Oil Mat Monitoring Location just one mile west from the capsize location) declined to lightly oiled by mid-May 2006, just six months post incident.

[76] Claim, Appendix 3
[77] Email from NPFC to NOAA, dated November 6, 2019
[78] AI from NOAA, received November 25, 2019
[79] Teleconference between NOAA and NPFC February 6, 2020
[80] As opposed to a quantity of oil moving across the sea bottom impacting a total of 705 acres during the eight months prior to dissipation
[81] The 705 acres do not need to experience eight months of persistent oiling simultaneously, but each acre must experience eight months of oiling for this metric to reasonably represent the actual injury.
[82] Environmental Unit Monitoring Report, Appendix M
[83] Situation Report #32, December 1, 2005

Given that the data for locations that were resampled support oil moving across the sea bottom rather than persistence in place, the NPFC finds NOAA's application of 100% service loss for eight months applied to the 705 acres described as moderately to heavily oiled is not supported and magnifies the injury by as much as 37% depending on oil mobility. Essentially, NOAA acknowledges and accounts for the mobile nature of the oil in calculating the area of oiling but then ignores the mobile nature of the oil in calculating the period of injury before onset of recovery. As discussed above, those areas repeatedly sampled support that oil persisted for around two months at levels of oiling sufficient to cause 100% injury. The NPFC finds that two months of 100% service loss is a supportable input to the HEA in lieu of the eight months applied in the Claim.

With regard to the rate of recovery once recovery begins – a literature review of benthic recovery rates post-oiling for other incidents supports NOAA's assertion of a three-year linear recovery upon initiation of recovery as reasonably conservative and compatible with available information.[84]

Restoration Selection, Scaling, and Implementation

RESTORATION SELECTION

NOAA determined that the impacted area likely recovered to baseline conditions naturally and primary restoration would not contribute significantly to recovery of the injured area.[85] NOAA therefore focused restoration planning on compensatory restoration projects only. NOAA identified and evaluated a range of project alternatives capable of restoring ecological services comparable to those lost.[86] The selected restoration alternative is an estuarine shoreline protection and salt marsh restoration project at the Moody Unit of the Texas Chenier Plain National Wildlife Refuge Complex (TCPNWRC). The project is designed to: protect shoreline with a protective breakwater structure consisting of rip-rap, create salt marsh behind the breakwater, and protect existing marsh from erosion.[87] Similar projects in the vicinity have successfully protected previously eroding shorelines and contributed to marsh protection, rehabilitation, and/or creation. The design will place the breakwater structures in depths no greater than -1 foot elevation and will provide for relief from the bay bottom of at least 3 feet, allowing for a substantial structure that will be capable of withstanding storm events and continue to provide shoreline protection over the 20-year breakwater design life given the anticipated effects of sea level rise throughout the region. *Spartina alterniflora* will be planted within the protected area landward of the breakwater to accelerate marsh creation by trapping and stabilizing sediments.[88]

[84] DEA Report, pages 10-11
[85] Claim, page 11
[86] Plan, pages 41-45
[87] Plan, pages 46-55
[88] Plan, page 50

The total protected marsh area[89] is based on the assumed protection against 2.5 feet/year of erosion (a cumulative 67 feet over the life of the project or 8.1 acres/mile).[90] The NPFC requested additional information regarding NOAA's assumption of a 2.5 feet/year erosion rate given NOAA's reference of erosion rates within the TCPNWRC from 9 to over 50 feet/year.[91] On October 28, 2019 NOAA replied that the 2.5 feet/year of erosion was determined in consultation with the FWS managers for the target restoration area and was verified through an ArcGIS comparative analysis of orthorectified historic aerial photography.[92] The NPFC determined that the erosion rate is further supported by a 2001 study conducted by the FWS to predict the effects of sea-level rise to Moody NWR.[93]

NOAA provided sufficient evidence for the likelihood of success of the project, referencing several other successful similar projects in the vicinity and promoting excess design specifications to address increasing storm and sea level rise considerations.

RESTORATION SCALING

The selected project produces or protects habitat (rocky shoreline and estuarine marsh) different than the habitat injured (offshore subtidal sandy benthic). As such NOAA scaled the relative services provided by the divergent ecosystems. NOAA determined that based on the productivity services and shoreline protection benefits, 4.23 miles of rip rap and the associated created and protected marsh would compensate the public for the losses from the *DBL 152* oil spill.[94] The NPFC evaluated several aspects of the restoration scaling: (1) the productivity ratios used, (2) productivity as a scaler for the total ecological services lost and the ecological services gained through restoration, and (3) the HEA calculations.

Comparison of productivity between habitats: NOAA used habitat productivity as the scaling metric to determine the equivalent discounted service acre years (DSAYs) of restoration to compensate for the interim loss of ecological services as a result of the spill. Productivity is a composite measure of an animal's population, biomass, and growth over time, converting animal abundance and biomass data into a functional measure of energy flow through an ecosystem.[95] Productivity of an ecosystem is well correlated to the food web services provided by that ecosystem, as such, it is an appropriate metric when comparing food web services across differing ecosystems.[96] For both the 2012 HEA and the 2019 HEA, NOAA used a 4.5:1

[89] NOAA's statement that 8.5 acres of existing marsh would be protected from erosion appears to be a misstatement of 8.5 acres per mile of project (or 36 acres over the 27 year life of the project), however the calculations in the HEA and the associated DSAYs compensated are consistent with the 8.5 acres/mile figure.
[90] 2019 HEA, Claim Appendix 3, Restoration 3
[91] Plan, page 46
[92] Additional Information received by NPFC, October 28, 2019
[93] Application of the Sea-level Affecting Marshes Model (SLAMM 6) to Moody NWR. 2001. Prepared for USFWS by Warren Pinnacle Consulting, Inc., cites erosion rates of 0.77-1m/yr applied based on erosion rates observed from 1931-2000 data in the Texas Hazard Mitigation Package, Texas Geographic Society.
[94] 4.23 miles of riprap would roughly result in 9 acres of riprap habitat, 11.5 acres of created marsh, and protect 36 acres of existing marsh (8.5 acres/mi).
[95] Valentine-Rose, Rypel, and Layman. Community Secondary Production as a Measure of Ecosystem Function: A Case Study with Aquatic Ecosystem Fragmentation. Bulletin of Marine Science. 87(4): 913-937. 2011.
[96] Wong, Melisa C., C.H. Peterson, and M.F. Piehler. 2011. Evaluating estuarine habitats using secondary production as a proxy for food web support. Marine Ecology Progress Services. 440: 11-25.

conversion factor for productivity of subtidal benthic to estuarine marsh habitat, referencing a study by Peterson et al. (2007) comparing productivity of estuarine habitats,[97] and supported by an assessment by Baker and Arismendez of Gulf of Mexico specific literature comparing productivity ratios of offshore habitats to estuary and marsh habitats along the Texas coast.[98] NOAA further cited ratios used in the Lavaca Bay NPL Site settlement[99] and benthic surveys by Parker et al. (1980) of proposed disposal sites off Louisiana[100] as further supporting the appropriateness of the 4.5:1 applied ratio. NOAA used a 0.45:1 conversion factor for productivity of subtidal benthic to riprap, predicated on a 10:1 ratio of riprap to estuarine marsh productivity.[101] The NPFC requested additional information regarding NOAA's specific consideration of the injury occurring within the seasonal hypoxic zone of the Gulf of Mexico[102] and productivity associated with benthic areas experiencing seasonal hypoxia.[103] NOAA responded that the Baker and Arismendez literature assessment references studies in the hypoxic zone and the range of results from their assessment included the 4.5:1 ratio developed by Peterson, therefore NOAA determined the ratios derived from Peterson (which is based on a greater volume of literature) were reasonable.[104] NOAA further reiterated the Lavaca Bay and Parker et al. references as corroborating evidence.[105]

The NPFC reviewed the literature referenced in the Baker and Arismendez memorandum, the Lavaca Bay NPL assessment, and the Parker et al. (1980) references. The Lavaca Bay NPL Settlement used a ratio of 5:1 benthic subtidal to estuarine marsh, based on the injured habitat being subtidal flats in Lavaca Bay at a depth of 2-8 feet (<1-2.5 meters) below mean sea level.[106] NOAA did not provide converted comparable metrics for the Parker et al. (1980) data. However, Entrix converted the data to a comparable metric used by Peterson et al. (2017) to arrive at a 17.2-21.5:1 ratio of off shore benthic to salt marsh. [107] Of the references in the Baker and Arismendez memorandum, the NPFC found the Rowe et al. 2002[108] study to include habitat most similar (depth, distance from shore, similarity of seasonal hypoxia) to that impacted by the spill.

[97] Peterson et al. 2007. Estuarine habitat productivity ratios at multiple trophic levels.

[98] Baker, Troy and Sandra Arismendez. 2011. Conversion factor between offshore benthic habitat and marsh habitat in the DBL 152 Oil spill. Memorandum for Record.

[99] Texas Natural Resource Trustees. 2001. Final Damage Assessment and Restoration Plan and Environmental Assessment for the Point Comfort/Lavaca Bay NPL Site.

[100] Parker, R.H., A.L. Crowe and L.S.Bohme. 1980. Biological/chemical survey of Texoma and Capline sector salt dome brine disposal sites off Louisiana, 1978-79. NOAA Technical Memorandum NMFS-SEFC-25, 103 p. In: Jackson, W.B. and G.M. Faw (Eds).

[101] Plan, page 30. If the ratio of subtidal benthic to marsh is 4.5:1 and the ratio of riprap to marsh is 10:1, then the ratio of subtidal benthic to riprap is 0.45:1

[102] Annual maps of the hypoxia zone are available through NOAA's HypoxiaWatch program, https://www.ncddc noaa.gov/interactive-maps/environmental-monitoring/hypoxia/

[103] Levin, L.A. et al. 2009. Effects of natural and human-induced hypoxia on coastal benthos. Biogeosciences, 6, 2063-2098.

[104] AI received by NPFC, October 28, 2019

[105] NOAA reiterated the corroborating nature of both references during teleconferences between NOAA and NPFC on December 13, 2019 and February 7, 2020

[106] NOAA did not provide the memorandum, Relative Habitat Service Provision Exercise and the memorandum, Expert Scores for Relative Habitat Service Provision which served as the basis for the ratio

[107] Entrix. 2009 Technical memorandum assessing NOAA's proposed compensatory restoration project and scaling methodology for the T/B DBL 152 incident. Included as an enclosure to the Dewey and LeBoeuf LLP letter to the NOAA Office of General Counsel dated June 5, 2009. Note: Entrix was a consultant hired by the RP.

[108] Rowe, G.T., M.E. Cruz Kaegi, J.W. Morse, G.S. Boland, and E.G. Escobar Briones. 2002. Sediment community metabolism associated with continental shelf hypoxia, northern Gulf of Mexico. Estuaries 25:1097-1106

Given the availability of information for like habitat, the NPFC determines that the ratios associated with the Rowe 2002 study (9.82-11.86:1 productivity of subtidal benthic habitat to estuarine marsh)[109] are more persuasive among the studies evaluated by Baker and Arismendez and that the Parker et al (2017) study should likewise have been considered. Similarly, an external review[110] of the references within the Peterson paper, the Baker and Arismendez assessment, and of the literature review conducted by Entrix resulted in a similar finding that the 4.5:1 ratio overvalues the productivity of the injured habitat and supports ratios ≥ 10:1 and 1:1 for marsh and riprap productivity compared to the injured habitat, respectively.

In NOAA's request for reconsideration, NOAA provided additional details and explanation regarding how NOAA determined 4.5:1 as the scaling ratio for offshore benthic productivity to estuarine marsh productivity. Largely, NOAA takes issue with NPFC highlighting the Rowe 2002 reference as more representative of the benthic productivity in the spill site than other studies cited. The NPFC acknowledges that the Rowe 2002 reference is not a perfect match for the spill site, but the NPFC reaffirms its finding that in NOAA's "weight of evidence approach," certain references, like Rowe 2002, should have been weighted more heavily and not simply averaged with other available references. NOAA's own assessment of Gulf of Mexico studies (equally weighting relevant studies) resulted in an average ratio of 4.9:1 yet NOAA still determined to use the more generous 4.5:1 ratio in the Peterson study. NOAA elected not to include the Lavaca Bay NPL site settlement ratios (5:1 for shallow offshore to estuarine marsh) or the Parker et al. (1980) ratios (17+:1) toward producing the calculated ratios though cited both several times in discussions as supporting the 4.5:1 ratio used. Additionally, NOAA elected not to use benthic sampling data to that was conducted by the RP's consultant during the response because NOAA was not party to the sampling effort and NOAA determined the "opportunistic" sampling to not be reliably extrapolated to the oiled zone in general.[111] It is interesting that NOAA would cite the seasonality of sampling in the Rowe 2002 study as inconsistent with the incident when NOAA also asserts 100% benthic productivity loss for 2 years or 8 months depending on methodology employed. NOAA provided no new evidence that alters the NPFC's determination with regard to productivity ratio and restoration scaling. The NPFC finds that a productivity ratio of 10:1 injured habitat acres to restored or protected marsh habitat acres and a productivity ratio of 1:1 injured habitat acres to riprap acres are supported inputs to the HEA.

Comparison of total ecologic services between habitats: Selecting out-of-kind compensatory restoration creates additional scaling challenges given the difficulty in choosing a common metric that scales reliably to the level of services provided by the habitats and any significant differences in the quantities and qualities of services. [112,113] NOAA described the impacted ecological services as including, but not necessarily limited to: chemical exchange across the

[109] Baker, Troy and Sandra Arismendez. 2011. Conversion factor between offshore benthic habitat and marsh habitat in the DBL 152 Oil spill. Memorandum for Record. Table 2
[110] DEA Report, pages 11-14
[111] Plan, p 18
[112] Habitat Equivalency Analysis: An Overview. 1995 (Revised 2000). Damage Assessment and Restoration Program, NOAA
[113] Scaling Compensatory Restoration Actions: Guidance Document for Natural Resource Damage Assessment under the Oil Pollution Act of 1990. 1997. Damage Assessment and Restoration Program. NOAA

interface between the sea floor and the water column, decomposition of and use of organic matter by benthic microalgae and other fauna, primary production, and habitat utilization by benthic and demersal fauna.[114]

The compensatory restoration provides the same type or comparable food web/habitat services but also includes an abundance of ecological services associated with shoreline structure and estuarine marsh that are not comparable to those impacted - services such as shoreline stabilization and erosion control; filtering sediment, nutrients, and pollutants; increasing flood storage capacity; slowing stormwater runoff; and maintaining connections between land and water ecosystems to enhance resilience.[115] NOAA acknowledged these benefits in the Plan along with enhanced recreational benefits, infrastructure benefits, and other public use.[116] Although various papers support productivity as a proxy for comparing food web support services across various habitats[117,118] - the types of services NOAA largely described as impacted by the spill – they generally do not go as far as to suggest productivity as a proxy for comparing the total value of ecological services between widely divergent ecosystems. Peterson et al. (2007) - the paper from which NOAA draws its conversion ratio - specifically states that "[their] comparisons provide the basis for constructing alternative metrics *for the food web support services* of estuarine habitats." Peterson et al. do not suggest the ratios apply to total ecological services. In response to a request for additional information regarding the validity of the metric for scaling total ecological services,[119] NOAA reiterated the common practice of using a single common, comparable metric in HEA and provided several resources as examples of use of a similar metric in the context of NRDA.[120] NOAA reaffirmed their position in the request for reconsideration.

The NPFC recognizes the difficulty in scaling out of kind restoration but disagrees that ignoring the differences in total ecological services lost and gained is justified. NOAA clearly stated in the DARP that the services impacted by the spill are those related to benthic productivity and those enhanced by the restoration include both productivity and non-productivity related ecosystem services. These increased benefits of the restoration further support the NPFC's determination that more conservative scaling ratios, as described above, are supported as an input to the HEA.

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[114] Plan, page 25

[115] NOAA Guidance for Considering the Use of Living Shorelines. 2015

[116] Plan, pages 52-53

[117] Wong, Melisa C., C.H. Peterson, and M.F. Piehler. 2011. Evaluating estuarine habitats using secondary production as a proxy for food web support. Marine Ecology Progress Services. 440: 11-25

[118] Peterson et al. 2007. Estuarine habitat productivity ratios at multiple trophic levels

[119] Email Request for Additional Information from NPFC to NOAA, November 6, 2019

[120] NOAA November 25, 2019 response to request for Additional Information cited:

- French McCay, D., P. Peterson, and M. Donlan. 2002. Restoration scaling of benthic, aquatic, and bird injuries to oyster reef and marsh restoration projects. ASA, Inc., UNC – Chapel Hill, and IEc, Inc. https://pub-data.diver.orr noaa.gov/admin-record/6404/French%20McCay%20et%20al%202002.pdf - this incident scaled restoration of like habitat
- French McCay, D., and J. J. Rowe. 2003. Habitat restoration as mitigation for lost production at multiple trophic levels. Marine Ecology Progress Series **264**:233-247. – this incident scaled restoration equivalent to higher order trophic level injuries
- Unsworth, R. E., and R. C. Bishop. 1994. Assessing natural resource damages using environmental annuities. Ecological Economics **11**:35-41. – this incident scaled restoration of like habitat

HEA calculations: As previously described, NOAA used a HEA model to calculate the DSAYs of injury and DSAYs per mile of restoration for the three restoration components to generate a total number of miles of restoration to compensate for the injury. NOAA modified the 2012 HEA[121] methodology and two of the HEA inputs (area of injury and time to onset of recovery) for the 2019 HEA used to support the Claim.

Both the 2012 HEA and the 2019 HEA utilize a discounting rate of 3% per year. This is a standard economic discounting rate historically accepted by the NPFC. However, NOAA changed its methodology related to partial year discounting. NOAA explains the change as necessary to "account more accurately for annual discounted service-acre year values in the HEA over time than the continuous 'decimal years' time format used in the 2012 HEA. Specifically, the 2019 HEA discounts losses and gains based on the calendar year that they were incurred."[122] NOAA further explained that utilizing monthly units provided a method for accommodating the 8-month period of injury before onset of recovery.[123] The NPFC finds that NOAA's explanation adequately supports adjusting the methodology to account for the less-than-full-year of injury at 100% loss.

Finally, NOAA estimates the riprap will reach its fullest service level (95% of the services of a typical rip-rap structure) in 3 years, remain at that level for 5 years (2021 for purposes of the HEA) and then decline in function linearly to Year 20 (2033).[124] NOAA estimates the restored marsh will yield 71.3% of the services of a fully functioning marsh in 15 years (2028), plateau at that level for four years (2032), then degrade linearly through Year 27 (2040) once the shoreline protection benefits of the rip rap cease. The existing marsh is protected through Year 26 (2039) at the 100% service level and then declines in relation to the lost restored marsh (losing all protected service value in Year 27 (2040). The NPFC requested NOAA provide the basis for these estimates[125] for which NOAA provided additional reference materials and discussion that include various studies supporting the 71.3% service level of created marsh and explanation of the 95% service level of the riprap sill structure relative to a typical riprap structure.[126] The NPFC acceptsNOAA's assessment of the 20-year estimated design life as few references could be found regarding expected design life for similar riprap sill construction.[127]

The NPFC finds that the estimated service level of the created marsh and riprap and expected lifecycle of the project are supported inputs to the HEA.

RESTORATION COSTS

[121] The 2012 HEA is incorporated into and supports restoration scaling in the Plan
[122] Additional Information received by NPFC, October 28, 2019
[123] Teleconference between NOAA and NPFC February 6, 2020
[124] Years are measured from the HEA base year of 2013. The associated calendar year will shift to reflect years from implementation of the project.
[125] Email from NPFC to NOAA requesting additional information, dates November 29, 2019
[126] Additional information received December 19, 2019
[127] By comparison, the design life for a similar project at Moses Lake (a more protected bay within Galveston Bay) is 25 years, though it is unclear whether the design specifications are comparable. Coastal Erosion Planning and Response Act (CEPRA) Economic and Natural Resource Benefits Study, Texas, April 2013

NOAA's estimated restoration costs include $895,021.82 for Planning, $11,433,904.75 for Construction, $208,758.72 for Monitoring, and $626,884.26 for Administration and Oversight. Planning costs are largely based on an American Society of Civil Engineers (ASCE) fee curve formula applied to estimated construction costs and consistent with estimates commonly used by NOAA.[128] The Administration and Oversight estimate is similarly scaled to other costs reflecting 5% of the sum of the planning, construction, and monitoring components (a NOAA standard estimate for restoration activities). Monitoring costs are associated with six days annually of structural and functional assessment of the restoration project and 30 hours annually for report generation. Monitoring costs are predominated by personnel, travel and equipment use with a minimum of laboratory services and a post monitoring aerial survey. Construction costs are based on an estimated 1000 feet/day of limestone placement over 22 days and 1.5 acres/day of marsh grass planting over 8 days. The vast majority of the construction costs are associated with the installation of the limestone breakwaters which is estimated at $500/linear foot.

The NPFC finds the costs are supported for the activities identified. The standard rates related to design and administration/oversight are commonly accepted and within range of completed restoration activities previously approved by NPFC.[129] Although NPFC did not find corroborating references for NOAA's estimate of $500/linear foot for installed limestone,[130,131,132] the *total* project cost per linear foot ($580/foot) is average for similar projects in southeast Texas: Virginia Point Project at $380/foot,[133] Galveston State Park Project at $599/foot,[134] and Indian Point Project at $785/foot.[135]

MONITORING

As described, the project activities include installation of breakwaters of limestone or concrete riprap and the planting of *spartina alternaflora* within the protected area landward of the breakwater.[136] Project performance will be assessed by comparing quantitative monitoring results to predetermined performance standards that define the minimum physical or structural conditions deemed to represent normal and acceptable development of a marsh in order to

[128] Appendix 19, Planning Tab, Notes

[129] By comparison NPFC approved costs for Administration/Oversight for the Florida Mystery Spill NRD Restoration Claim, M00098-OC1 were 13%; for the T/V Margara Primary Restoration Claim, M06017-OC01 were 5.9%; the M/V Jireh emergency restoration Claim, M12037-OC02 were 16.5%, and the Athos I Assessment and Restoration Claim, P05005-OC1 were 3.9%

[130] Claim Appendix 19, Tab Construction Costs

[131] Galveston Bay Foundation. Living Shorelines: A natural approach to erosion control, Table 3 includes estimates for installed cost of limestone rock ranging from $125-$200/linear foot for offshore/nearshore breakwaters

[132] DEA Report, page 15 estimated cost of limestone material at ~$1M but did not include delivery/installation and made no guarantees with regard to cost estimates for the described project

[133] National Fish and Wildlife Foundation. Gulf Environmental Benefit Fund: Virginia Point Shoreline Protection and Estuarine Restoration Announcement identifies a 10,000 ft rock breakwater and marsh planting at cost of $3,800,000 or $380/ft total cost

[134] National Fish and Wildlife Foundation. Gulf Environmental Benefit Fund: Galveston Island State Park Marsh Restoration and Protection in Carancahua Cove identifies a 5,400 ft rock breakwater and dredge and fill activities at cost of $3,234,500 or $599/ft total cost

[135] Texas Trustee Implementation Group Final 2017 Restoration Plan/Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; and Oysters. 2017, page 40-41 identifies a 2,800 linear foot breakwater project for $2,199,000, or $785/ft

[136] Plan, pages 49-50

determine whether the project goals and objectives are achieved or whether corrective actions are required to meet the goals and objectives.[137] NOAA will develop the specific performance measures and the monitoring program prior to implementation of the project. Although NOAA defers design of the monitoring program, the budget included with the Claim provides greater detail regarding the scope of intended monitoring. [138] The monitoring budget anticipates annual surveys of both structural and functional restoration components for five years following the "as built" post construction survey. Survey parameters include topobathy slope profile and breakwater elevation; vegetation survival, percent cover, and biomass; and oyster spat settlement, abundance, and survival. NOAA states that the construction bid package will be developed such that the contractor is required to perform corrective actions as indicated by the performance reports reflected in the monitoring budget.[139]

The NPFC will pay monitoring costs necessary to accomplish the activities for which a claim is paid[140,141] - monitoring which informs the installation of stable breakwaters and the planting of marsh grasses (i.e., the activities identified by NOAA in their Claim). Structural and functional performance monitoring for the purpose of documenting service values generated are not compensable from the Fund except as such data would inform the cessation of a restoration activity. NOAA provided additional information[142] explaining the relationship between, and the purposes of, the "As Built" survey and the five years of structural and functional monitoring. NOAA clarified that a portion of the construction budget will be retained over the course of the monitoring period to ensure performance of corrective actions relevant for structural/functional project performance. However, NOAA also states in their budget that, "Structural and functional monitoring parameters identified in the budget relate directly to and allow NOAA to document compensation through restoration of the benthic production ecosystem service lost as a result of the DBL 152 oil spill."[143] NOAA does not distinguish between monitoring activities that inform anticipated corrective actions vice monitoring activities for documenting service values generated. Similarly, though NOAA cites the 5-year monitoring horizon as an industry standard, it is unclear whether that standard is based on the historical time period associated with necessary adaptive maintenance/corrective actions, the time period associated with evaluating project success to release an RP or permittee from additional liability, or for providing longterm performance data to inform future restoration opportunities. Given the number of similar projects conducted in the area, there are ample reference projects to inform a successful design. The NPFC finds five years of annual monitoring excessive for evaluating whether the restoration activities (installation of riprap sill and vegetation plantings) are complete, however the NPFC recognizes that there is some risk involved with vegetation planting therefore the NPFC approves two monitoring events to evaluate whether the riprap structure is stable and the vegetation survives the planting process.

[137] Plan, page 50
[138] Claim, Appendix 19, Monitoring Tab
[139] Claim, Appendix 19, Planning Tab, notes
[140] 33 CFR §136.211(b)
[141] Monitoring which NPFC will approve generally includes monitoring to meet regulatory permitting requirements, performance standards to release a construction contractor from additional liability, and monitoring to inform anticipated corrective actions or management activities that are included as a component of the restoration activity and are based on specified performance metrics
[142] Additional information received November 25, 2019
[143] Claim, Appendix 19 Projected Restoration Costs, Monitoring Tab

Past Assessment Costs

NOAA claimed $306,465.91 in past costs for labor and indirect costs ($302,010.04), travel ($4,397.38), and purchases ($58.49) that were incurred by NOAA from January 7, 2007 through July 23, 2016 for the purpose of assessing natural resource damages. Labor costs were supported by agency timesheets and descriptions of labor for each employee, indirect costs were supported by documentation of indirect cost calculation methods, purchases were supported by receipts, and travel was supported by signed travel vouchers.

The Plan and associated claim materials document that NOAA's past costs were incurred for: (1) legal support for assessment and restoration planning activities, review of the Plan, NEPA compliance, and issuing of the Federal Register Notice of Final Plan (2) compilation and evaluation of assessment information, (3) development of HEA and restoration scaling, (4) response to public comments, (5) development and evaluation of restoration options, and (6) compilation of cost documentation.

The NPFC determines that NOAA provided sufficient evidence to warrant proceeding with a natural resource damage assessment.[144] The NPFC further finds that the associated costs are for appropriate assessment activities,[145] the associated costs were reasonable, and that NOAA's costs were properly documented.

Final Analysis and Determination

Based on the above, the NPFC determines that the $306,465.91 in past assessment costs are compensable in accordance with 33 C.F.R. §136.211(a).

With regard to Damages, in its request for reconsideration, NOAA specifically requests payment of the full value of the presented claim, or, in the alternative, payment of equitable compensation to fund natural resource restoration. The NPFC acknowledges that data collected during the response and long term monitoring, support some level of injury. Similarly, the NPFC acknowledges that NOAA's shoreline protection and salt marsh project has a high certainty of success based on long-term documented use of the technique[146] and that the project has the potential to compensate for ecosystem services lost from the *DBL 152* incident. As described above, the NPFC finds that the information available supports certain inputs to the HEA that alter the scale of the project. NOAA did not provide any specific information regarding the scalability of the project and associated costs, however many of the component costs are scaled to distance or area and similarly scaled projects exist in the geographic area.

Based on data submitted by NOAA and information independently reviewed by the NPFC, the NPFC offers $4,532,941.59 in restoration costs. This offer is outlined below.

<u>ADJUSTED HEA INPUTS RELATIVE TO THOSE IN THE 2019 HEA</u>

[144] 15 C.F.R. §990.44
[145] 15 C.F.R. 990 Subpart E
[146] Plan, page 51

The NPFC dtetermines that the data support injury quantification and restoration scaling metrics as follows:

Length of Time of 100% Injury - 2 months in lieu of 8 months
Scaling offshore benthic to marsh habitat - 10:1 in lieu of 4.51:1
Scaling offshore benthic to protecte marsh habitat - 10:1 in lieu of 4.51:1
Scaling offshore benthic to constructed riprap - 1:1 in lieu of 0.45:1

These adjustments reduce the calculated discounted service acre years (DSAYs) of injured benthic offshore habitat from 1436 DSAYs to 1106 DSAYs and reduce the project distance that produces the equivalent DSAYs from 4.23 miles to 1.47 miles (34.8% of NOAA's assessed project).

REVISED DAMAGES CALCULATION

The project involves placement of riprap along a shoreline and planting *Spartina* at a particular density. As such much of the cost, and certainly the most expensive components associated with the restoration, are scaled to the size of the project.[147] Though the NPFC recognizes that some costs may not be directly scalable, the NPFC applied the 34.8% project size uniformly to the budget, while accounting for certain denied monitoring and associated administrative costs.

	Request	Total following certain denied costs	Total applying 34.8% scaling
Planning	895,021.82	895,021.82	311,467.60
Construction	11,433,904.75	11,433,904.75	3,978,998.85
Monitoring	208,758.72	76,496.49[148]	26,620.78
Admin and Oversight	626,884.26	620,271.15[149]	215,854.36
Total	**$ 13,164,569.56**	**$ 13,025,694.22**	**$ 4,532,941.59**

TIMING OF NPFC INPUT

NOAA asserts that "even if NOAA agreed with the NPFC's suggested productivity ratio, we could not have made a change in our claim."[150] The NPFC issued its determination in June 2020 only after multiple requests and discussions related to scaling. There is sufficient precedent in NPFC claims adjudication to support that the NPFC accommodates adjustments to claimed damages in light of new information or revised interpretation of information discovered during the adjudication process. Similarly, as provided in the Claims Regulations, 33 C.F.R. Part 136, NOAA was provided an opportunity to request reconsideration of the claim *for the relief requested* providing any additional support. NOAA was not prevented from, or advised against, adjusting the total of the *relief requested*. The NPFC finds that the NPFC provided ample notice and opportunity for NOAA to adjust their claim.

[147] The primary expense, limestone delivery, is budgeted at $500/ft, engineering and design is a formula dependent on the construction cost (though not quite linear), and Admin and Oversight is a straight 5% of Planning, Construction, and Monitoring
[148] Costs associated with the first two proposed monitoring events
[149] 5% of the total of Planning, Construction, and Monitoring
[150] Request for Reconsideration. September 25, 2020. 6 pp.

Summary and Final Decision

The NPFC has reviewed the Claim submitted by NOAA for past assessment costs and future costs to implement its compensatory restoration project for the *DBL 152* incident in the context of NOAA's request for reconsideration and in accordance with OPA (33 U.S.C. §2701 et seq.) and associated OSLTF Claims Regulations (33 C.F.R. Part 136). Through this determination, the NPFC approves past assessment costs of $306,465.91 incurred by NOAA and $4,532,941.59 in damages for future restoration, for a total of $4,839,407.50. The NPFC denies claimed damages of $8,631,627.96. This written decision is final. By accepting the NPFC's settlement offer of $4,839,407.50, NOAA affirms that restoration of the type and scale associated with the offer is reasonably viable. The Trustees should refer to the included transmission memorandum regarding requirements associated with acceptance terms and conditions.