



U.S. Environmental Protection Agency Geographic Response Plan - 2021 Penobscot River (PR-04) Testing Exercise

After Action Report June 29-30, 2021

The After-Action Report/Improvement Plan (AAR/IP) aligns exercise objectives with preparedness doctrine to include the National Preparedness Goal and related frameworks and guidance. Exercise information required for preparedness reporting and trend analysis is included; users are encouraged to add additional sections as needed to support their own organizational needs.

EXERCISE OVERVIEW

Exercise Name	2021 Penobscot River (PR-04) Exercise
Exercise Date	June 29-30, 2021
Scope	These exercises were Full-Scale Exercises, conducted over a two-day time period in Old Town and Indian Island, ME, and upon the waters of the Penobscot River. Exercise play was limited to the Penobscot River and the adjacent shoreline in the vicinity of the Old Town Boat Ramp in Old Town, ME and the northern shoreline of Indian Island.
Mission Area(s)	Response
Core Capabilities	Environmental Response/Health and Safety, Operational Coordination, Operational Communications.
Objectives	<p>Objective 1: Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.</p> <p>Objective 2: Test and evaluate existing Penobscot River GRP (PR-04) tactics and identify any changes or modifications necessary to achieve goal of protecting sensitive resources following an oil spill that impacts the Penobscot River and the surrounding area. Test and evaluate personnel and vessel access to key areas of the Penobscot River for boom deployment and other protection measures.</p>
Threat or Hazard	Discharge of oil into a navigable waterway.
Scenario	An oil spill has occurred that threatens the Penobscot River downstream of Mattawamkeag, ME and the surrounding area. The Maine DEP, Penobscot Nation, Milford Fire Department, EPA Region 1, and the U.S. Coast Guard Atlantic Strike Team will utilize standard GRP booming tactics to protect sensitive resources in the vicinity of Indian Island and the surrounding area.
Sponsor	U.S. Environmental Protection Agency.
Participating Organizations	<p>Participating organizations included:</p> <ul style="list-style-type: none">• Penobscot Nation Department of Natural Resources• Milford Fire Department• Old Town Fire Department• Maine Department of Environmental Protection (ME DEP)

- U.S. Coast Guard (USCG)
- U.S. Environmental Protection Agency (EPA)
- Nuka Research and Planning Group, LLC (Nuka Research)

Note: See Appendix B for participant count.

**Point of
Contact**

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USCG Atlantic Strike Team and ME DEP personnel
conduct basic boom/anchoring training prior to field
deployments



Personnel prepare and deploy ME DEP oil spill response
equipment at Old Town boat ramp



Photos courtesy of EPA Region 1

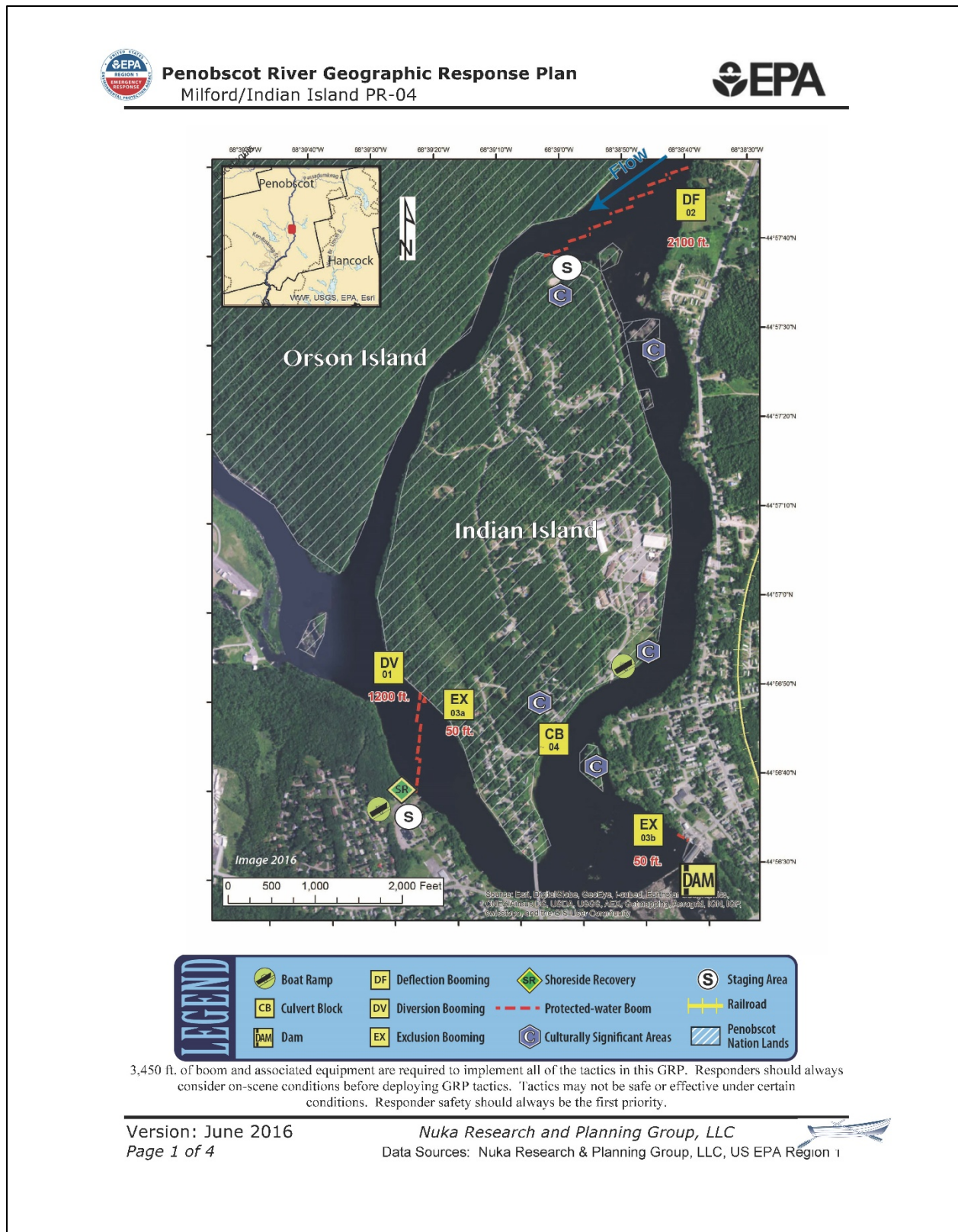


Figure 1. Milford/Indian Island PR-04 GRP

ANALYSIS OF CORE CAPABILITIES

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the evaluation team. Table 2 includes compiled data from the Exercise Evaluation Guide (EEG) including the organizational capability targets, associated critical tasks, and observations as observed during the exercise and determined by the evaluation team.

Objective	Core Capability	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.	Environmental Response/ Health and Safety		S (Days 1 & 2)		
Test and evaluate existing Penobscot River GRP (PR-04) tactics and identify any changes or modifications necessary to achieve goal of protecting sensitive resources following an oil spill that impacts the Penobscot River and the surrounding area. Test and evaluate personnel and vessel access to key areas of the Penobscot River for boom deployment and other protection measures.	Natural and Cultural Resources	P (Day 1)	S (Day 2)		
Ratings Definitions: <ul style="list-style-type: none"> Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified. Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws. Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s). 					

Table 1. Summary of Core Capability Performance

Note: Two boom deployments were conducted over two consecutive days testing two different strategies on the PR-04 (Milford/Indian Island) GRP (see Figure 1 above). DV-01 was deployed and tested on June 29, 2021 (Day 1), and DF-02 on June 30th (Day 2). Table 2 below incorporates observations made during both days deployment activities. Observations/Notes that are specific to either Day 1 (D1) or Day 2 (D2) are annotated as such.

Core Capability	Organizational Capability Target	Associated Critical Tasks	Observation Notes
Environmental Response/ Health and Safety	Basic Booming Operations	<ul style="list-style-type: none"> Transport and tow boom. Anchoring and Connecting boom to shore Safe vessel and crew operations. (Refer to ICS-208 in the Exercise Plan) 	<ul style="list-style-type: none"> Performed without Challenges (P) All operations conducted in a safe manner. ME DEP clearly demonstrated their preparedness as evidenced by their robust equipment capabilities and experience in small boat operations and boom deployment. ME DEP equipment was readily available and easy to deploy. ME DEP maintains palletized boom (900 ft per aluminum frame pallet) as well as anchor system totes with each tote containing a Fortress Danforth anchor, 25' of anchor line, 10' trip line, and buoys. Both ME DEP and Penobscot Nation vessels proved to be capable assets during boom towing, positioning and anchoring to achieve the desired cascade configuration for tactic DV-01. Extraordinary skill was demonstrated in towing sections of boom, especially with strong downstream current and a northerly (downstream) breeze. While boom towing, tending, and deployment were carried out successfully and safely during both deployments, boat operators and crew indicated that the addition of cleats on skiffs would make towing/deployment easier. Recommendation: For all vessels without them, recommend installation of standard or cam cleats (if vessel design allows) to make towing, tending, and deployment easier and safer. Shore operations including shoreline anchor set-up, and boom and anchor system prep and delivery to deployment vessels was performed safely and expeditiously. Boom recovery and especially towing/transfer of boom from the location of DV-01 to the north end of Indian Island to stage for Day 2 deployment was conducted efficiently and safely by Penobscot Nation skiffs. These skiffs, equipped with jet drives, were the only suitable vessels that could transit the portion of the river on the west side of Indian Island due to shallows and rocky bottoms. On both days, anchoring, even with Fortress anchors, was a challenge due to bottom type/ledging, causing several anchors to drag and require resetting. In some cases, additional anchors were added at some anchor points. On Day 2, participants noted that some close-to-shore boom sections that were anchored with marine anchors at both ends could have been anchored

			to shore (from the shoreward end) due to their close proximity to the shoreline and more substantial shoreside anchor points.
	Implement Tactics in GRP	<ul style="list-style-type: none"> • Deploy Diversion Boom -DV-01 (Day 1) • Deploy Deflection Boom - DF-02 (Day 2) • Evaluate logistics of using staging areas/boat ramps • ID areas where permanent shoreline anchor attachments may be installed. • Feasibility of pre-identified collection points 	<p>to shore (from the shoreward end) due to their close proximity to the shoreline and more substantial shoreside anchor points.</p> <ul style="list-style-type: none"> • Performed with Some Challenges (S) • <u>Day 1</u>: The first boom section deployed was 400 ft long and due to the prevailing current speed and prevailing wind blowing from almost directly upstream, vessels had difficulty towing this length of boom. The ME DEP Incident Commander quickly made the decision to reduce boom sections from 400 to 200 ft. This became the norm for both deployments and is cited in some GRP documents as a “standard” boom length for towing. • <u>Day 1</u>: 1,000ft boom deployed in total (1-400ft and 3-200ft sections). Did not extend all the way to Indian Island shoreline. Decision made to cease at 1,000 ft due to difficult conditions and because this configuration/length was adequate to test efficacy of strategy using surrogate. • The use of trip/tag lines allowed for easy adjustment of several anchors used for the for the diversion booming tactic. • Buoys were effectively used to mark the beginning point of a new section of cascade boom and each anchor trip line, making boom section and anchor adjustment much easier. • Site surveyed by PN & ME DEP for future installation of permanent anchor points. • Old Town Boat Ramp - Nominal staging area and boat ramp/floating dock. Heavy public use (boats and swimmers) in summer. Need to manage this for response purposes. • <u>Day 2</u>: Decision made prior to deployment to modify DF-02 configuration and deploy a 1,000 ft multi-leg deflection array at a shallower angle and only part way west toward Orson Island rather than deploying the 2,100 ft array as depicted on the current GRP. This decision was based on lessons learned from the previous days’ deployment and from observations at the north end of Indian Island which indicated that the predominant flow is from east to west making it likely that a partial deflection strategy should work to deflect oil around the west side of Indian Island as intended. Ultimately, 5-200 ft boom sections were deployed in a cascade array as planned. • <u>Day 2</u>: Boom deployment at the site of DF-02 requires launching from OT BR. River on west side of Indian Island and area north of Indian Island is shallow. PN jet boats are ideal platform for this area. • <u>Day 2</u>: Current stronger in this area (compared to DV-01 site). Moving from east to west along north side of island. • While vessel crews were able to deploy the DV and DF arrays effectively, it was noted that it was at times difficult to determine proper boom angle/placement from vessel crews vantage points. The available drone (and drones in general) could have been an effective tool in more effectively and expeditiously deploying boom, especially cascade and chevron arrays. While having drone footage available following boom deployment was helpful, a recommendation was made to share drone images via smartphone (drone

			operator to vessel crew) during deployment to aid vessel crews in boom section placement/deployment.
Natural and Cultural Resources	Protect Natural and Cultural Resources	<ul style="list-style-type: none"> Following actions carried out under Capability 1 above and the application of an oil surrogate, test and verify the efficacy of prescribed booming strategies. 	<ul style="list-style-type: none"> Performed with Some Challenges (S) <u>Day 1</u>: Strategy as deployed and under conditions encountered on this date proved effective at diverting surrogate shoreward. Following surrogate deployment, the prevailing current drove the surrogate downstream along the length of the DV-01a tactic. However, surrogate did not make it all the way to shoreline recovery point because the wind shifted (from north most of the day to west) which kept surrogate from making it all the way to the shoreline. <u>Day 2</u>: With a southwest breeze blowing (against the current), the surrogate remained virtually stationary in the water after release. Because of this the test of this particular strategy was ultimately unsuccessful and the GRP will not be changed.

Table 2. Summary of Organizational Capability Targets and Associated Critical Tasks

ME DEP and Penobscot Nation personnel deploy the DV-01 strategy on June 29, 2021



Photo courtesy of EPA Region 1

ME DEP and Penobscot Nation personnel prepare boom and anchor systems for the DF-02 deployment on June 30, 2021



Photo courtesy of EPA Region 1

The following sections provide an overview of the performance related to each exercise objective and associated core capability, highlighting strengths and areas for improvement.

Objective 1: Demonstrate the ability to deploy oil spill equipment utilizing common Geographic Response Plan (GRP) tactics.

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

Core Capability 1: Environmental Response/Health and Safety

Strengths

The full capability level can be attributed to the following strengths:

Strength 1: Participation by exercise participants from federal, state, tribal, and local agencies (EPA, USCG, Penobscot Nation, ME DEP, Milford FD) was excellent and they all worked well together. All exercise participants were extremely engaged and actively involved. Vessel and shoreside Strike Teams were well organized and effectively carried out assigned tasks.

Strength 2: ME DEP clearly demonstrated their experience and preparedness as evidenced by their robust equipment capabilities and overall experience in small boat operations and boom deployment.

Strength 3: While some participants did indicate that vessel-to-shore communications were difficult at times due to the small vessel crews and the need to multi-task (i.e., vessel operation, equipment transfer, equipment deployment) under challenging environmental conditions (river flow rate/current and wind), both vessel-to-shore and inter-vessel communications was excellent over the course of both days deployments. ME DEP's field response expertise was clearly demonstrated through the ease with which they communicated amongst their own personnel and the way they seamlessly integrated Penobscot Nation and local first responders into their verbal and radio communications.

Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 1: For all vessels without them, and if vessel design allows, recommend installation of standard or cam cleats to make towing, tending, and deployment easier and safer.

Reference: N/A.

Analysis: While boom towing, tending, and deployment were carried out successfully and safely during both deployments, boat operators and crew indicated that the addition of cleats on skiffs would make towing/deployment easier.

Area for Improvement 2: ME DEP, Penobscot Nation, and other first responders should consider obtaining drones for use in oil spill response operations.

Reference: N/A.

Analysis: While vessel crews were able to deploy the DV and DF arrays effectively, it was noted that it was at times difficult to determine proper boom angle/placement from vessel crews vantage points. The available drone (and drones in general) could have been an effective tool in more effectively and expeditiously deploying boom, especially cascade and chevron arrays. While having drone footage available following boom deployment was helpful, a recommendation was made to share drone images via smartphone (drone operator to vessel crews) during deployment to aid crews in boom section placement/deployment.

Area for Improvement 3: Make revisions to the Milford/Indian Island (PR-04) GRP.

Reference: EPA Region 1 Geographic Response Plan for Milford/Indian Island (PR-04)

Analysis: Based on the results of field testing, the following changes will be made to the PR-04 GRP and are reflected below in Appendix A:

- Based on this deployment, DV-01 will be modified and lengthened from 1,200 ft to 1,600-1,800 ft (8-9 200ft sections), creating a steeper angle and extending eastern (Indian Island) shore anchor point farther north.
- Add Dewitt Field - Old Town Municipal Airport graphics and labeling to GRP map including location of Seaplane landing area on river itself. DV-01 is located directly within this seaplane landing area.
- Update Special Considerations to include seaplane landing area info.
- Update contact list to include airport contact info. (207) 827-7175 and (207) 852-1916.

Objective 2: Test and evaluate existing Penobscot River GRP (PR-04) tactics and identify any changes or modifications necessary to achieve goal of protecting sensitive resources following an oil spill that impacts the Penobscot River and the surrounding area. Test and evaluate personnel and vessel access to key areas of the Penobscot River for boom deployment and other protection measures.

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

Core Capability 2: Natural and Cultural Resources

Strengths

The full capability level can be attributed to the following strengths:

Strength 1: Penobscot Nation personnel, though having no significant training or experience in oil spill response, were actively and effectively engaged in all aspects of these deployments, and their local knowledge and vessel capabilities were instrumental in the successful completion of

both deployments. Throughout the entire exercise planning process and during both field deployments they demonstrated complete commitment to protecting their natural and cultural resources and enhancing their working relationships with EPA Region 1, ME DEP, and the U.S. Coast Guard.

Strength 2: Penobscot Nation personnel conducted pre-deployment site surveys to determine boom shoreline anchor points for the purposes of undertaking the DV-01 and DF-02 deployments while also surveying shoreline areas for future permanent anchor points.

Strength 3: At the conclusion of both deployments, ME DEP and Penobscot Nation personnel began discussions and are considering staging ME DEP boom pallets on Indian Island so that spill response equipment is readily available for use by Penobscot Nation personnel.

Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 1: In the absence of detailed bottom contour information for the Penobscot River, recommend that all vessels conducting future boom deployment in and around Indian Island (and other areas of the Penobscot River for that matter) keep extra line readily available to adjust anchor line length when ledge areas are discovered or generally when anchor lines need to be lengthened.

Reference: N/A

Analysis: On both days, anchoring, even with Fortress anchors, was a challenge due to bottom type/ledging, causing several anchors to drag and require resetting. In some cases, additional anchors were added at some anchor points.

DV-01 booming strategy (and peat moss as an oil surrogate) successfully deployed between Old Town Boat Ramp and Indian Island. View looking northeast. (Note peat moss on water surface in lower portion of photo)



Photo courtesy of Nuka Research & Planning Group

DF-02 variant deployed north of Indian Island on June 30, 2021. View looking upriver towards the north-northeast



Photo courtesy of Nuka Research & Planning Group

APPENDIX A: IMPROVEMENT PLAN

This IP has been developed specifically for the exercise participants of this Geographic Response Plan (GRP) Exercise conducted on June 29-30, 2021.

Core Capability	Issue/Area for Improvement	Corrective Action	Capability Element ¹	Primary Responsible Organization	Organization POC	Start Date	Completion Date
Core Capability 1: Environmental Response/Health and Safety	Lack of cleats on skiffs made towing, tending, deploying boom and anchor systems difficult at times	For all vessels without them, and if vessel design allows, recommend installation of standard or cam cleats to make towing, tending, and deployment easier and safer.	Equipment	ME DEP or Penobscot Nation	Robert Shannon or Dan Kusnierz	Agency discretion	Agency discretion
	Difficult for boat crews to determine proper boom angle/placement.	ME DEP, Penobscot Nation, and other first responders should consider obtaining drones for use in oil spill response operations. With on-scene drone, images of boom position can be shared via smartphone (drone operator to vessel crews) during deployment to aid crews in boom section	Equipment	ME DEP or Penobscot Nation	Robert Shannon or Dan Kusnierz	Agency discretion	Agency discretion
	Revise PR-04 GRP	DV-01 will be modified and lengthened from 1,200 ft to 1,600-1,800 ft (8-9 200ft sections), creating a steeper angle and extending eastern (Indian Island) shore anchor point farther north.	Planning	Nuka Research	Mike Popovich	07/24/21	09/12/21
	Revise PR-04 GRP	Add Dewitt Field - Old Town Municipal Airport graphics and labeling to GRP map including location of	Planning	Nuka Research	Mike Popovich	07/24/21	09/12/21

¹ Capability Elements are: Planning, Organization, Equipment, Training, or Exercise.

		Seaplane landing area on river itself. DV-01 is located directly within this seaplane landing area.					
	Revise PR-04 GRP	Update Special Considerations to include seaplane landing area info.	Planning	Nuka Research	Mike Popovich	07/24/21	09/12/21
	Revise PR-04 GRP	Update contact list to include Dewitt Field and Brookfield (dam) contact info.	Planning	Nuka Research	Mike Popovich	07/24/21	09/12/21
Core Capability 2: Natural and Cultural Resources	Unsuccessful surrogate test for DF-02 due to opposing wind/current conditions	Recommend small scale surrogate test by Penobscot Nation or ME DEP (with or without boom) to determine general flow pattern and/or deflection strategy efficacy.	Exercise	ME DEP or Penobscot Nation	Robert Shannon or Dan Kusnierz	Agency discretion	Agency discretion
	Lack of available oil spill response equipment on Indian Island	Following both deployments, ME DEP and Penobscot Nation personnel informally discussed the possibility of staging some ME DEP oil spill response equipment on Indian Island for immediate use by tribal members.	Equipment	ME DEP and Penobscot Nation	Robert Shannon and Dan Kusnierz	Agency discretion	Agency discretion

APPENDIX B: EXERCISE PARTICIPANTS

Participating Organizations – June 29, 2021	
Penobscot Nation	
Penobscot Nation Department of Natural Resources	5
Town of Milford, ME	
Milford Fire Department	2
Federal	
United States Environmental Protection Agency (EPA)	2
United States Coast Guard (USCG)	3
Nuka Research and Planning Group, LLC (contractor for US EPA)	2
State	
Maine Department of Environmental Protection (DEP)	6
TOTAL	20

Participating Organizations – June 30, 2021	
Penobscot Nation	
Penobscot Nation Natural Resources	5
Federal	
United States Environmental Protection Agency (EPA)	2
United States Coast Guard (USCG)	4
Nuka Research and Planning Group, LLC (contractor for US EPA)	2
State	
Maine Department of Environmental Protection (DEP)	4
TOTAL	17

70% of participants reported having previous GRP exercise/boom deployment experience.