A Guide for Preparing Geographic Response Plans and Strategies for Marine Incidents in the MaPP Region

Prepared for Marine Plan Partnership for the North Pacific Coast (MaPP)
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Acronyms

AoC	Area(s) of Concern
BC	British Columbia
CCIRA	Central Coast Indigenous Resource Alliance
CFN	Coastal First Nations
CHN	Council of the Haida Nation
CRIMS	Coastal Resource Information Management System
GBI	Great Bear Initiative
GPS	Global Positioning System
GRP	Geographic Response Plan
GRS	Geographic Response Strategy
ICP	Incident Command Post
ICS	Incident Command System
MaPP	Marine Plan Partnership for the North Pacific Coast
MPIAC	Marine Plan Implementation Advisory Committee
NCSFNSS	North Coast-Skeena First Nations Stewardship Society
POR	Place of Refuge
PORCP	Places of Refuge Contingency Plan
RAF	Regional Action Framework
RMAC	Regional Marine Advisory Committee
STAR	Spill Tactics for Alaska Responders
US	United States

Key Terms and Concepts

Area(s) of Concern (AoC) - is a discrete coastal area(s) or facility such as a cove, bay, marina, estuary, aquaculture facility that has been determined by a community - such as First Nations - to be of social, cultural, ecological, or commercial value. An Area of Concern is designated for GRS development if operationally feasible. Areas of Concern are typically sensitive and vulnerable to pollution impacts (*e.g.,* oil, cargos, wreckage). An Area of Concern is identified and referenced on coastal maps.

Geographic Response Plan (GRP) - is a geographic-specific plan for marine incidents that identifies notifications, logistical needs, protection sites, and response strategies to facilitate decision-making and field response in the event of a marine incident. A GRP can be a document, database, interactive map, or combinations thereof. It also provides an umbrella for multiple site-specific geographic response strategies (GRS) within a region.

Geographic Response Strategy (GRS) - is a pre-established tactical plan tailored to protect an Area of Concern during a marine incident if operationally feasible. GRS provide tactical (operational) information to protect areas of concern (AoC), and include practical and logistical information to facilitate quick deployment during an incident. There can be more than on GRS within an Area of Concern. A GRS is a two or three page document with maps, pictures, diagrams, and instructions used by operational field personnel.

Incident Command Post (ICP) **-** a temporary facility used by an Incident Management Team functioning under the ICS to deliver command, management and tactical direction.

Incident Command System (ICS) - is a standardized on-site management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

Marine Incident - any incident involving a vessel, railway, pipeline, vehicle, or facility, or natural event such as a seismic event, landslide or severe storm, that results in marine pollution or the threat of pollution - such as a spill, debris, wreckage - and/or that poses a threat to coastal people and/or their communities.

Place of Refuge (POR) - is a location where a vessel needing assistance can be temporarily directed, and where actions can then be taken to stabilize the vessel, protect human life, reduce a hazard to navigation, and/or protect coastal resources. A "potential" POR is identified and referenced on coastal maps, and may be included in GRP. It is best practice to develop PORs, GRP, and GRS through a harmonized and coordinated process.

Unified Command - is an authority structure under the Incident Command System (ICS) in which the role of incident commander is shared by two or more individuals who have authority in a responding agency or jurisdiction. Under Unified Command, responding agencies and/or jurisdictions with responsibility for the incident work together to manage the incident response.

During a marine incident, local, provincial, and federal government, as well as First Nations may assign a representative to Unified Command. In the event of a vessel incident, the shipowner (Responsible Party) may also be represented in Unified Command

About MaPP

Marine Plan Partnership for the North Pacific Coast (MaPP) is a collaborative planning and plan implementation process for Central and North coastal areas of British Columbia. It is a partnership between the Province of British Columbia, the Coastal First Nations-Great Bear Initiative (CFN-GBI), the North Coast-Skeena First Nations Stewardship Society (NCSFNSS), the Central Coast Indigenous Resource Alliance (CCIRA), the Council of the Haida Nation (CHN) and the Nanwakolas Council. Collectively, MaPP's Partners includes seventeen member First Nations. MaPP's study area is divided into four sub-regions: Haida Gwaii, North Coast, Central Coast and North Vancouver Island. Website: http://mappocean.org

About EnviroEmerg

EnviroEmerg Consulting (Duncan, BC) focuses on emerging regional, national and international environmental issues related to oil and hazardous material spill risk, prevention, preparedness and response. Sectors include transportation (vessel, rail, road, pipeline) and industrial (manufacturing, storage). Clients include: government, companies, First Nations, and non-governmental organizations.

Stafford Reid (Guide Author) - principal of EnviroEmerg Consulting - has over 40 years experience in environmental management. Over the last 27 years, work has focused on marine vessel risk and spill response preparedness. Website: EnviroEmerg.ca

About Nuka Research and Planning Group

Nuka Research and Planning Group, LLC (Plymouth, Massachusetts / Seldovia, Alaska USA) is an environmental consulting firm that offers services to support policy development, planning, training, outreach and facilitation for industry, government, indigenous and non-profit sectors related to oil and gas and marine transportation projects.

Elise DeCola (Guide Author) - General Manager and co-owner - has over 20 years of experience spanning natural resource management, oil spill contingency planning, environmental assessment, disaster preparedness, regulatory compliance, emergency response, fisheries management, environmental outreach, policy analysis, and legislative affairs. Website: http://www.nukaresearch.com

Executive Summary

This document outlines a process for developing Geographic Response Plans (GRP) and Geographic Response Strategies (GRS) within BC's *Marine Plan Partnership for the North Pacific Coast* (MaPP) region. The approach recommended here aligns with the marine incident planning, preparedness, and response principles outlined in the MaPP's 2017 *Regional Strategy for Marine Incident Response: Planning and Preparedness* and represents a workable consensus-based approach that would advance preparedness for marine emergencies throughout the region.

The MaPP Regional Action Framework (RAF), developed by partners from First Nations and the Province of BC, recognized there are insufficient planning, preparedness and response measures and capacity in place to address marine incidents that pose a risk to life, the environment and communities. The development of GRP and GRS for the MaPP region through a government-to-government collaboration will fill some of the gaps in marine incident response planning and preparedness. This approach follows the recent successful example of Places of Refuge (POR) planning in the Haida Gwaii sub-region.

This guide is a primer on why, when, where, and how to prepare GRP and GRS. The guide explains important concepts, approaches, and elements to ensure consistency and relevance through out the MaPP region. It reflects international best practice for consensus-based geographic response planning founded on successful models from the United States (US) and Australia. This collaborative approach strongly focuses on First Nations leadership and knowledge-holders, and creates a framework for collaboration across local, First Nation, provincial, and federal governments. While specific to the MaPP region, this approach could be applied in other regions of BC or Canada.

The hierarchical planning process described in this guide will create four GRP for the MaPP region – one for each MaPP sub-region. The GRP will include information on incident notifications, logistics, response capabilities, and highly sensitive or vulnerable Areas of Concern (AoC). Each GRP will include a number of GRS, which are site-specific tactical plans developed within AoC. They are intended for use during the initial response phase of marine incidents to mitigate potential impacts to high value resources and facilities. GRP and GRS fit together and provide strategies for local first responders to take prevention and mitigation action. Because the plans are developed through a collaborative process away from the stress and urgency of an incident, they allow for measured input and consideration from local stakeholders, First Nations, and federal and provincial agencies. The GRS are developed with technical expertise on spill response and salvage to ensure that tactics are realistic, feasible, and safe.

The process of developing GRP and GRS provides an opportunity to assess local marine incident response capabilities in First Nation communities, and provides a foundation for future efforts to train and equip local stakeholders to take a proactive role in marine incident response.

Table of Contents

A Guide for Preparing Geographic Response Plans and Strategies for Marine Incidents

1. INTRODUCTION

This guide on developing Geographic Response Plans (GRP) and Geographic Response Strategies (GRS) reflects the intention and direction of 2017 *Marine Plan Partnership for the North Pacific Coast's* (MaPP) *Regional Strategy for Marine Incident Response Planning and Preparedness.* This guide is a primer on why, when, where, and how to prepare GRP and GRS.

This guide explains important concepts, approaches, and elements to ensure consistency and relevance throughout the MaPP region. It reflects international best practice for consensus-based geographic response planning based on successful models from the United States (US) and Australia. It also reflects commitments of First Nations, British Columbia, and Canada to work together in government-to-government relationships, and to combine First Nations traditional knowledge with other scientific approaches. This collaborative approach is consistent with principles of the MaPP partnership and policies outlined in Canada's *Oceans Protection Plan*. While a similar approach may be applied in other regions of BC and Canada, this guide focuses specifically on the MaPP region.

A New Paradigm for Coastal Emergency Planning and Preparedness

"The Government of Canada needs the traditional knowledge and expertise of Canada's Indigenous peoples and coastal communities to protect its coasts and waterways more efficiently. They have been safeguarding Canada's waters for years. They are often the first to respond to marine emergencies and can be the most affected when a marine pollution incident occurs. They have valuable insights and expertise to contribute to more effective response and protection of our coasts. Their partnership in the Oceans Protection Plan is a critical element of Canada's marine transportation system."

Prime Minister of Canada's announcement of Oceans Protection Plan, November 7, 2016

Key Concepts

This guide outlines a process that aims to be clear, transparent, and easily replicable. The approach differs from industry-led GRP development projects in British Columbia; it is more consistent with First Nations rights, title, and interests. It supports a collaborative approach envisioned by the 2016 *Oceans Protection Plan*.

Key components and benefits of this process are:

Components

- GRP and GRS objectives establish a coherent and replicable planning process that aligns with MaPP's *Regional Strategy for Marine Incident Response Planning and Preparedness* (hereafter, MaPP's Marine Incident Strategy).
- Clear and consistent terminology applies throughout all documents.
- A GRP boundary follows MaPP sub-regional designations for consistent marine planning.
- GRP and GRS focus addresses a range of hazards from marine vessels, fixed facilities, and natural events (*e.g.,* seismic, severe storm).
- Both GRP and GRS follow a consistent format for printing as electronic documents to enable incorporation into geographic information systems across platforms.

Benefits

- GRP and GRS development empowers coastal communities – often on the front lines of marine incidents -- to foster resilience and recovery.
- GRP and GRS preparation is a collaborative process led by First Nations, federal, and provincial agencies with meaningful involvement from local governments, industry, and response contractors.
- First Nation coastal communities become better equipped to deliver effective first strike (Tier 1) response capacity.
- GRP and GRS products help inform future efforts to enhance local response capacity within each sub-region.

MaPP and the Marine Incident Strategy

The *Marine Plan Partnership for the North Pacific Coast* (MaPP) is a co-led, government-to-government process between the Province of British Columbia, the Coastal First Nations-Great Bear Initiative (CFN-GBI), North Coast Skeena First Nations Stewardship Society (NCSFNSS), Central Coast Indigenous Resource Alliance (CCIRA), Council of the Haida Nation (CHN), and Nanwakolas Council. Collectively, these MaPP partners have developed plans for marine uses on the North Pacific Coast. Figure 1 shows the MaPP study area (Referred to as "MaPP region"). Marine plans were developed for the coastal and marine areas of four sub-regions within the MaPP region: Haida Gwaii, North Coast, Central Coast, and North Vancouver Island. These sub-regional marine plans set out objectives and strategies for achieving healthier oceans, stronger marine economies and improved cultural and social outcomes. A Regional Action Framework (RAF) was published in 2016 to establish regional MaPP actions that the provincial and First Nation governments have identified as being most appropriately implemented at a regional scale and that are consistent with, and support, sub-regional marine plan recommendations.

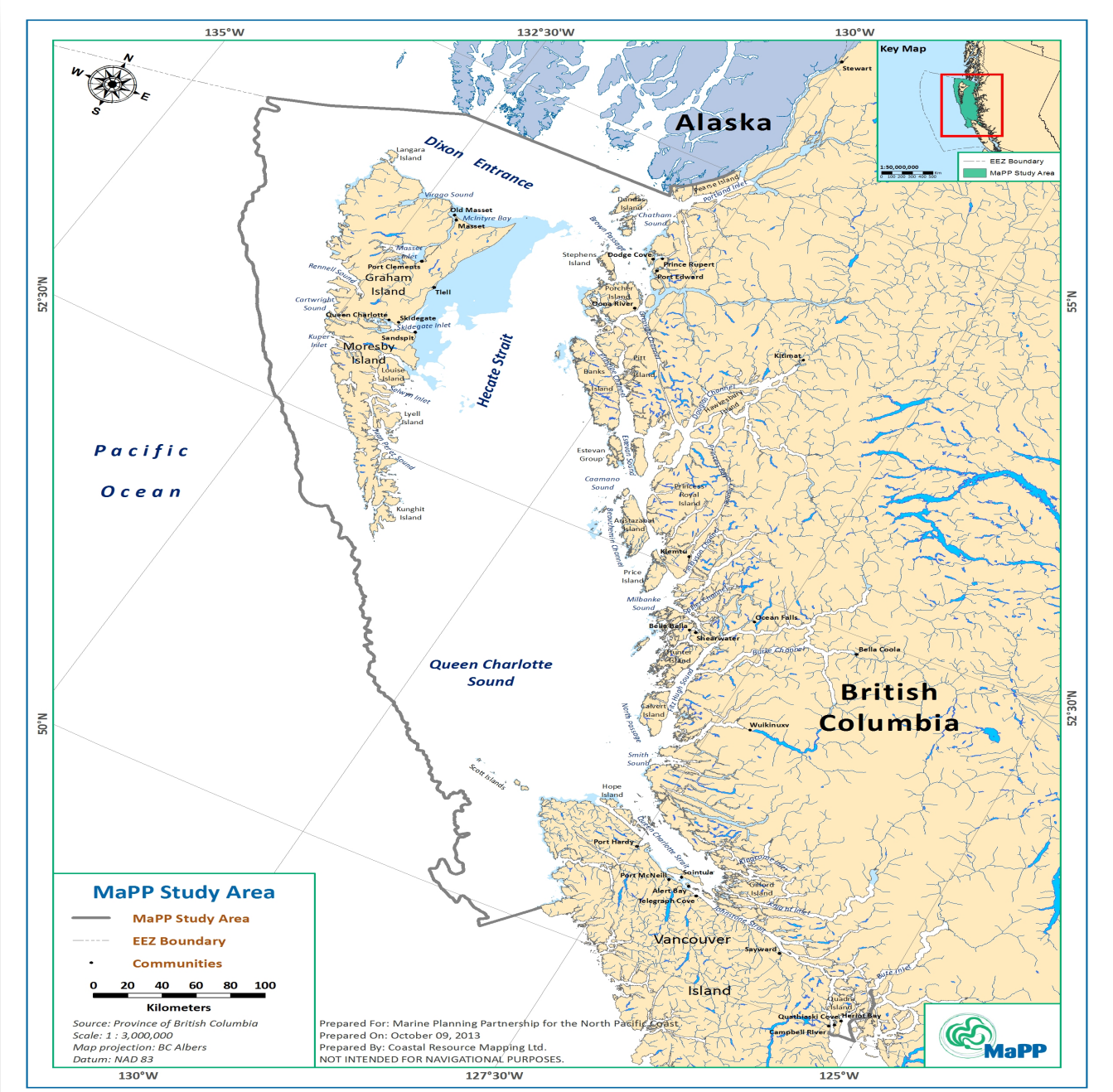


Figure 1: *MaPP Study Area (Region)*

Having GRP for marine incidents is recognized as part of MaPP's mission, reflecting the intention and direction of its 2017 MaPP Marine Incident Strategy. The MaPP Marine Incident Strategy incorporates many key concepts identified in this guide, such as: understanding marine vessel

casualty issues and solutions for improvement; building local response capacity with training and equipment; developing GRP and GRS; establishing Places of Refuge (POR) for potential use by a major vessel needing assistance, and more.

Geographic Response Plans and Strategies

Pre-planning for vulnerable and sensitive coastal areas saves time during the critical first hours of a marine incident, such as an oil spill. In the United States (US), GRP and GRS are an established approach to marine incident response planning - though some US terminology varies slightly from the approach described in this guide. Extensive GRP have been developed in States like Alaska and Washington that share many of the ecological and cultural attributes of BC's coast. This work provides a model for GRP development within the MaPP region.

This guide offers a process for developing GRP for each MaPP sub-region, and for developing site-specific GRS within so as to advance coastal protection in accordance with the MaPP Marine Incident Strategy. A collaborative process that recognizes the key role played by coastal community members as first responders in this region is essential to their successful development and implementation.

Building GRP based on MaPP Sub-regions

The MaPP Marine Incident Strategy envisions GRP and GRS development. Furthermore, it provides a geographical and hierarchical framework for marine incident planning that can readily incorporate GRP and GRS. The MaPP region is defined in the RAF, which identifies four sub-regions- as shown in Figure 2. Each sub-region has its own marine plan, and the process through which MaPP partners developed their marine plans supports GRP and GRS development.

Establishing GRP Boundaries

When establishing a GRP boundary, factors that should be taken into consideration:

- Harmonizing with established boundaries of local governments, and First Nation's territorial interests;
- Accounting for common risk factors, such as marine vessel transportation, pipelines, and facilities; and
- Embracing established resource management planning areas.

As described in the "Key Terms and Concepts" section of this guide, GRP are developed for a region or sub-region to provide critical incident response information such as notification, logistics, and resource sensitivity. A GRP should be developed for each of the four MaPP sub-regions (Haida Gwaii, the North Coast, the Central Coast, and North Vancouver Island) to capture common approaches to marine incident preparedness and response. These meet the criteria for establishing GRP boundaries (See: Text Box). They also maximize First Nation's management direction expressed within each of their sub-regional marine plans.

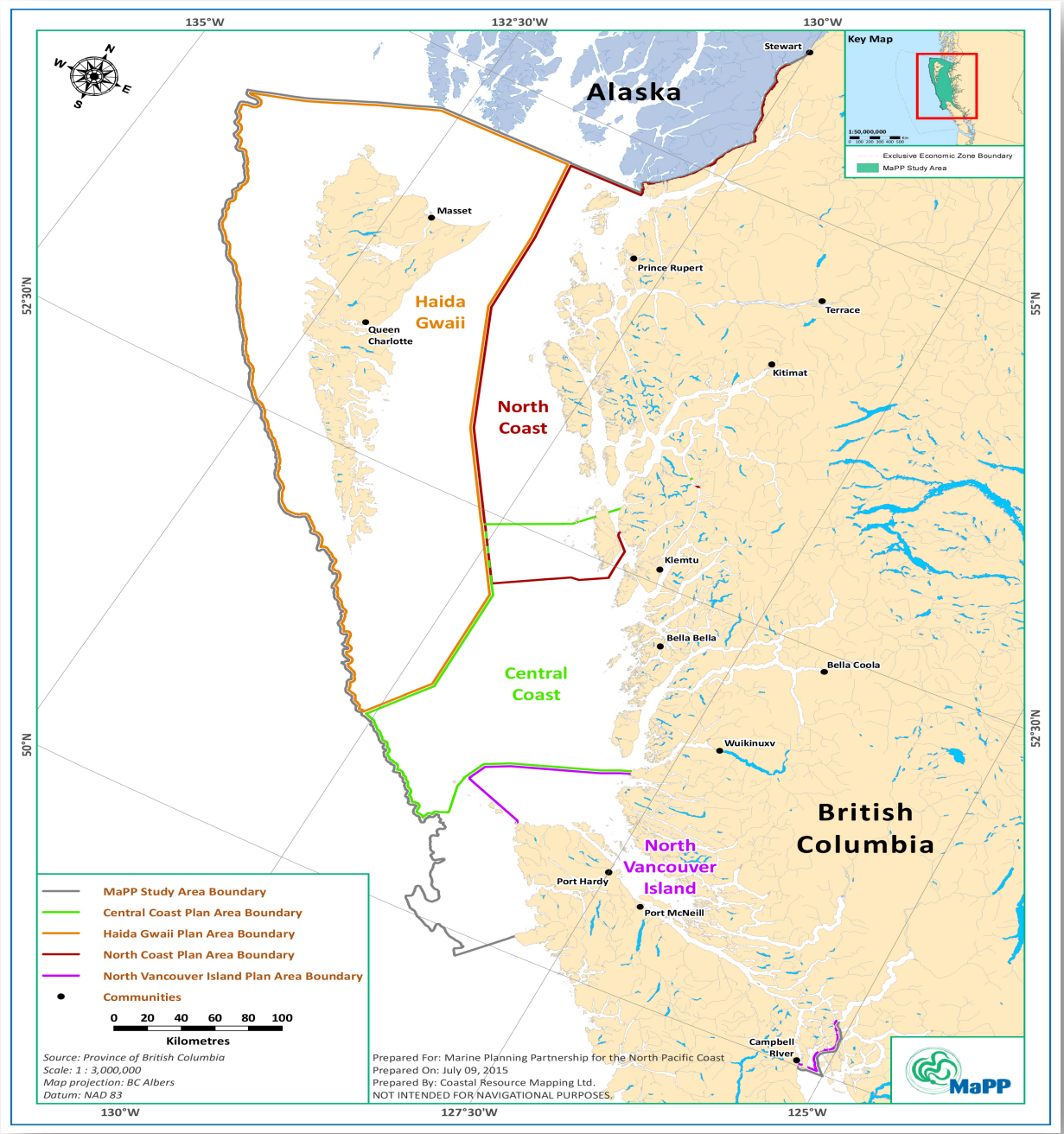


Figure 2: *MaPP Sub-regions*

Within each MaPP/GRP sub-region, a set of site-specific GRS would be developed. These identify field-ready deployment strategies and tactics for responders to protect Areas of Concern (AoC), which are sites and facilities with high values, vulnerabilities, and sensitivities. A GRS document include site-specific detail, including but not limited to: where and how to access the site; deploy protection strategies; and stage spill and salvage equipment.

Utilizing MaPP sub-regions to develop GRP also aligns with the approach taken by Transport Canada in revising its *Pacific Places of Refuge Contingency Plan* (PORCP), which includes a Haida Gwaii sub-regional annex, potentially a template for BC's coast. Places of Refuge plans identify potential sites for vessels needing assistance such as safe haven from a storm, needing repairs, or needing to mitigate a potential pollution incident.

MaPP partners within each GRP area (MaPP sub-region) can help to address key GRP planning issues, such as who will participate in incident notifications, the equipment under First Nation's management control that will be used for response, the AoCs that need to be protected, and the sites that would be prioritized for GRS development. The fact that the MaPP partnership already exists and is organized on a sub-regional basis should enable GRP/GRS processes to be implemented swiftly without compromising opportunities for local and First Nations participation and input. MaPP partners will work closely with federal agencies, and the GRP process will also allow for input and participation from other responders including local governments and response contractors.

Collaborative Process Led by Coastal Communities

MaPP also provides a framework to enable development of GRS for AoC within a GRP area, such as coves, bays, estuaries, marinas, aquaculture facilities, *etc.* The GRS development process involves First Nation and coastal community leadership and technical specialists conducting field assessments to:

1. Confirm social, cultural, ecological, and commercial resources at risk as the result of a marine incident;
2. Determine potential response strategies and tactics to protect and/or mitigate harm to resources at risk during a marine incident; and
3. Evaluate field logistics, such as site access, staging areas, support services, *etc.*, to support the deployment of response strategies and tactics.

GRP Process Facilitates Engagement

Preparing a GRP facilitates engagement amongst coastal communities, agencies, and industry. The *Assembly of First Nations* proposed three initiatives to build Crown-Aboriginal relationships and avoid lost opportunities:

- Empower Aboriginal communities through capacity support, socio-economic measures, and access to capital;
- Engage in environmental planning that incorporates Aboriginal knowledge and principles; and
- Facilitate shared decision-making that is inclusive and accountable.

(Source: November 2013: *Forging Partnerships, Building Relationships: Aboriginal Canadians and Energy Development*, by Douglas R. Eyford

At the site-specific (GRS) level, the people engaged in the process may include those with local knowledge and technical spill response experience, such as fishermen, marine spill responders, salvage experts, guardians, stewardship technicians, and others.

Preparing and responding to environmental emergencies stemming from a marine incident involves recognizing, respecting, and balancing social, cultural, ecological, and commercial values. A collaborative, government-to-government GRP and GRS development process has essential value to all participants and to stakeholders they represent. The GRP and GRS planning process provides an opportunity to consider inevitable trade-offs that occur during a marine incident, so that if a spill or other incident does occur, there is an appreciation for what is and is not feasible in terms of protecting AoCs from impacts. Including emergency responders in the process helps them to appreciate the resource sensitivities and concerns of local communities. Field surveys provide an opportunity to consider logistics and practical concerns, which can facilitate rapid deployment at the time of an incident. The process of inventorying local resources will also enhance opportunities to evaluate and build local incident response capacity among coastal communities.

All-Hazards Planning Scope

GRP in other jurisdictions typically focus on oil spill incidents as a single hazard. The proposed approach for GRP and GRS development in the MaPP region expands the planning beyond oil spills, which are one potential impact of a marine vessel incident, but not the only one. Other consequences are debris from its cargo (*e.g.,* chemicals, containers, lumber, bulk goods, ores, *etc.*) and the wreckage itself, should the vessel ground or sink. While this guide addresses in detail the vulnerability and sensitivity of coastal areas to potential spills of oil carried as cargo (*e.g.,* from tankers or barges) and/or as bunkers (*e.g.,* from ship's fuel tanks), it also addresses other types of marine incidents as described in MaPP's Marine Incident Strategy:

> *A marine incident is not restricted to one resulting in an oil spill; instead, it is defined herein as any incident involving a vessel, railway, pipeline, vehicle, or facility, or natural event such as a seismic event, landslide or severe storm, that results in marine pollution (e.g., spill, debris, wreckage) and/or that poses a threat to coastal people and/or their communities.*

This broad focus allows coastal communities to identify sites and facilities to develop appropriate response strategies for AoC from an all-hazards perspective.

Focus on First Strike Response by Coastal Communities

Geographic response planning was originally conceived in the US as an approach to fill the void during the initial hours of an incident when chaos and uncertainty can delay protection of high value resources. The process of identifying AoC and developing field-ready plans to deploy protective strategies enhances first strike capacity, and supports the concept of a tiered response (See Text Box).

In this guide, it is envisioned that properly trained and equipped local first responders (members or residents of nearby First Nations and other coastal communities hired to provide a critical first strike capacity) are most likely to deploy the GRS using local resources. This conforms to standard best practice of approaching spill preparedness and response using a three-tier system. "Tier 1" response – also referred to as first strike or initial response – typically describes the actions taken on-scene by an industrial facility, a local government, a port, or a First Nation.

Based on a tiered approach, both the GRP and GRS are part of a Tier 1 capacity. Therefore, to implement the GRS, a Tier 1 spill response capacity must be available. For the purpose of this guide,

Tiered Response Concept

Excerpts from 2015 IPIECA-OGP *Tiered preparedness and response: Good practice guidelines for Using the tiered preparedness and response framework:*

Tiered preparedness and response can provide further risk reduction by establishing the means to mitigate the potential environmental consequences associated with any spill scenario, from small localized releases through to more complex larger-scale events which potentially span national boundaries. One of the most powerful principles of tiered preparedness and response is the importance of cooperation and partnership between governments and the oil, ports and shipping industries to develop an integrated response capability. This single principle underpins the concept by allowing local, regional and global resources to combine in an effective and efficient manner to tackle a spill of any size and complexity.

Collectively these resources combine to establish response capability, and are categorized according to whether that capability is held locally, regionally or internationally (Table 1). This geographical distinction is at the core of the tiered model, and enables capability to be built around the potential severity of the incident and the time frame in which resources are needed on scene.

Table 1 *Geographical reach of each tier capability*

Capability	Geographical reach
Tier 1	Local
Tier 2	Regional or national
Tier 3	International

Tier 1 capacity describes First Nations and coastal communities, since they would provide the local capacity to implement GRS. While this capacity may not yet exist for all areas within the MaPP region, and the lack of presently available local resources should not be considered as a reason for not developing site-specific GRS. Instead, the GRS and GRP may be used to support future analyses of local response capacity, and informs future efforts to procure and stockpile equipment within each GRP area and to train and hire local community members as Tier 1 responders.

Format and Use of GRP and GRS

Four GRP will be developed for the MaPP region – one for each MaPP sub-region. They will generally follow a consistent format to make them easy to use and reference. The GRP will consolidate key information that Tier 1 initial response personnel would need at the time of a marine incident. A GRP will be designed to harmonize and support the management of a marine incident under the Incident Command System (ICS), but they will not repeat information about ICS or spill response that is captured in other contingency plans, operational guidelines, or training materials.

They may be cited or annexed by other marine incident response plans developed by industry or by federal or provincial government.

The number of site-specific GRS developed to protect AoC within each GRP area will be determined during the development process. Each GRS document will follow a consistent format that is similar to the 2-page POR plans developed for the Haida Gwaii sub-region.

Each GRP will be available as a collection of electronic (pdf) documents consisting of, but not limited to: sub-regional notification lists, maps (*e.g.,* ecological, shoreline type/oil sensitivity, communication coverage), logistical information, as well as compiled GRS and POR data and formatted documents. This format enables the GRP to be compiled and disseminated by: hard-copy (*e.g.,* binder); within computer folders; by a database; by a geospatial computer application; or combination thereof. Videos and images can also be components of the GRP to communicate coastal values and mitigation measures. All these components are intended to be sourced, posted, and referenced within an agencies and First Nations office or Incident Command Post (ICP) environment at the on-set of a marine incident.

2. GRP AND GRS DEVELOPMENT

A GRP is a tool used to recognize and to protect a community's social, cultural, commercial and ecological values during response to a marine incident and to any resulting pollution within a defined geographical area. GRS are site-specific tactical measures contained therein. This section describes the process used to develop a GRP and its GRS. The process described here aligns with the hierarchical approach to incident planning and preparedness outlined in MaPP *Regional Strategy for Marine Incident Response Planning and Preparedness* (see Figure 3).

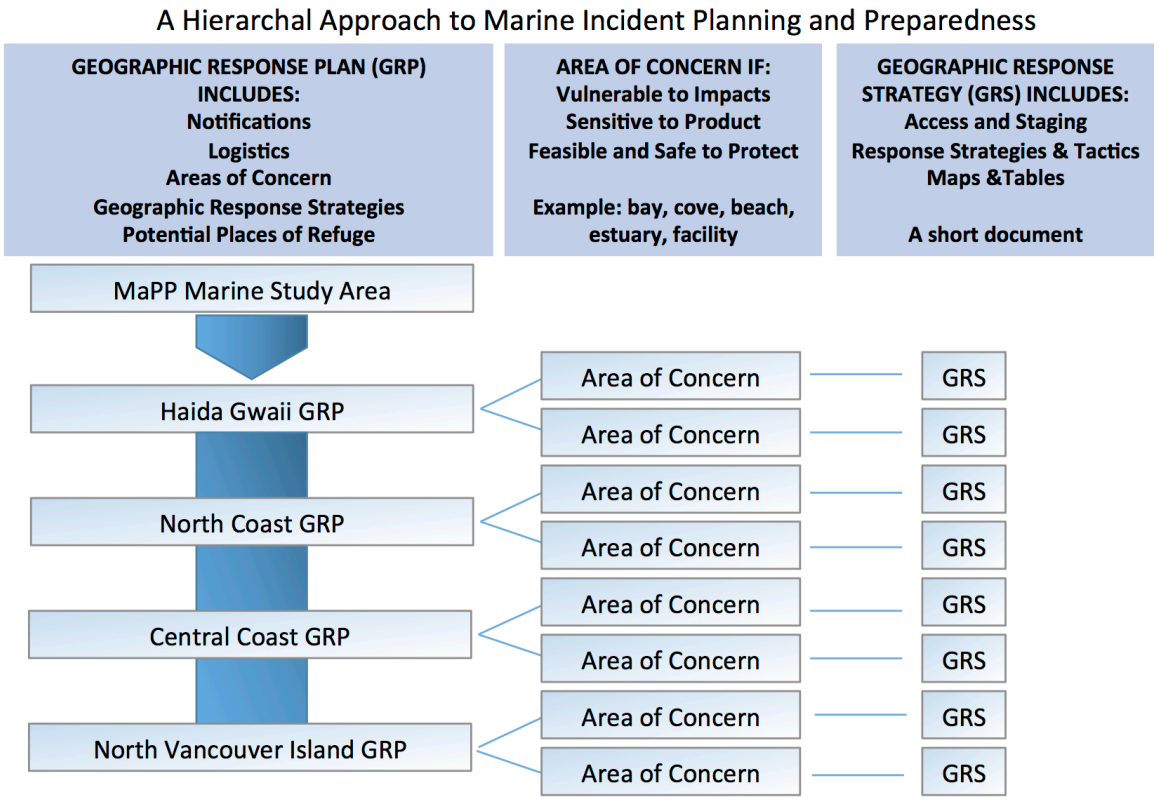


Figure 3: *Hierarchical Approach to Marine Incident Planning and Preparedness* (from MaPP *Regional Strategy for Marine Incident Response Planning and Preparedness*, 2017)

GRP Contents

As a sub-regional document, a GRP contains critical information about sub-regional characteristics related to marine incident preparedness and response. It identifies who should be notified in the event of marine incidents, and may provide or reference contact information. It captures information about resource values and activities, shoreline types and their sensitivity to oil or chemical spills or vessel cargo impacts, as well as harmful exposures to a seismic or a severe storm event. It also catalogues important logistics information, such as equipment inventories, local trained personnel,

site access (*e.g.,* road, water, or air), staging areas, and supporting local infrastructures/facilities (*e.g.,* hospitals, airports, marinas, docks).

A GRP integrates coastal community values into tactical planning by pre-identifying strategies to protect high-value resources and sites from adverse impacts. These strategies are compiled as GRS. They ensure initial incident response resources (*e.g.,* equipment, people) are deployed at the right place and time, to protect the highest priority coastal resources and facilities. A GRP listings of who to notify, consideration of logistics, and other preparedness factors help to ensure GRS implementation can be successfully undertaken.

Table 1 identifies key components of GRP. Some of this information already exists for the MaPP region, while some requires additional compilation and input from local knowledge holders. Collation of this information into a GRP significantly reduces the amount of information gathering time during a marine incident.

Table 1: Contents of a GRP

GRP Section	Description of Contents
Introduction	Purpose and scope of GRP, how it was developed, how it is intended to be used.
Notifications	Identify points of contact to be notified in the event of an incident within the GRP area.
Resource Values and Activities	Information about ecological, social, cultural, and commercial values and activities, such as: species at risk, aquaculture areas, roads, marine traffic, pilotage, harbour boundaries, and communications (*e.g.,* VHS, cellular).
Shoreline type and Oil Spill Sensitivity Maps	Relevant information from the *BC Coastal Resource Information System* (CRIMS) managed by GeoBC. BC shores have been segregated into shoreline units based on a shore's geomorphology (*e.g.,* sandy beach, rocky headland). Shoreline (representative) type maps provides information about the geomorphology of a shore unit. The oil sensitivity maps provide a ranking of each shoreline unit's sensitivity to oiling from a heavy product (represented by Bunker C) or a light one (represented by diesel oil).
Logistics	Logistics information will include inventories of equipment and personnel that may be used during a marine incident, such as: field responders, technical specialists, potential sites for command posts, communications and transportation infrastructure, staging areas, and resources to support response personnel (*e.g.,* lodging, food, *etc.*).
Geographic Response Strategies	An overview map showing GRS locations within the GRP area, and a full set of GRS.
Places of Refuge	An overview map showing potential POR locations within the GRP area, and a full set of PORs.

GRP and GRS Development Process

The process of developing a GRP and its GRS involves two concurrent activities, implemented by a technical working group. The process (shown in Figure 4) is generally sequential, but some of the steps may take place concurrently. Several steps involve multiple iterations of information development and review. Each step is described in detail in subsequent sub-sections of this guide.

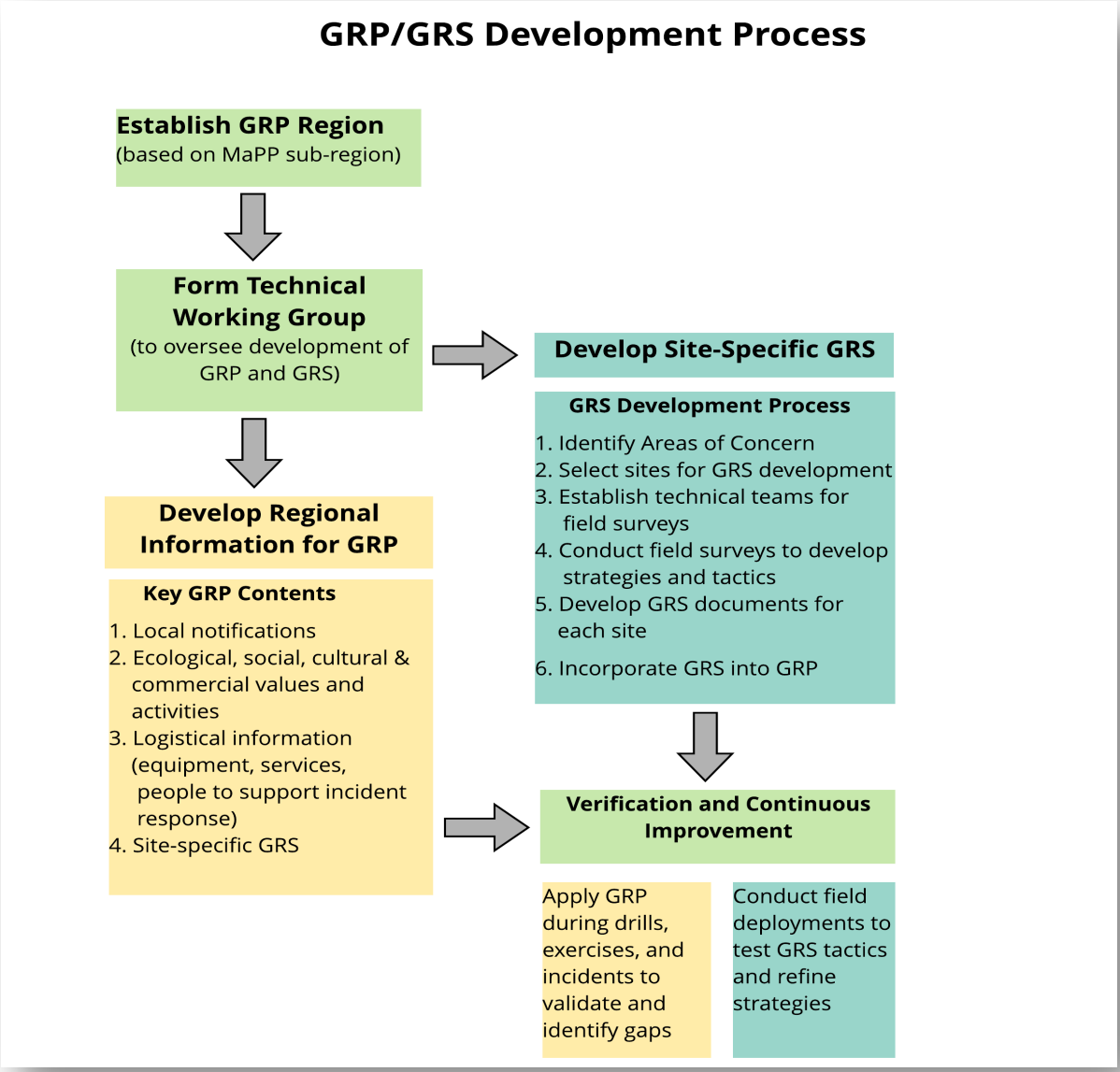


Figure 4: *GRP/GRS Development Process*

The establishment of potential POR fundamentally follows the steps of a GRS, but entails technical specialists to address vessel requirements, including access/egress feasibility, anchoring requirements (*e.g.,* substrate and swing distances), and docking facilities. Public and community safety also needs to be addressed (for example, in the event that a vessel needing assistance is on fire or carrying hazardous materials). GRP, GRS, and POR development projects may be combined, as has been done in the State of Alaska.

GRP Working Group

Role of Working Group

The GRP working group provides direction, oversight, and input. Because many of the steps involved in developing a GRP and its GRS require an understanding of community values and priorities, this working group must include knowledgeable representatives of communities within the GRP area. Stewards and owners of resources and facilities must also participate. This includes representative from local, federal, provincial and First Nation governments. The buy-in of GRP working group members into the process is critical to using the products during marine incident response.

Participation

A GRP working group should include a broad range of expertise, including local knowledge, stakeholder interests, government agencies with a role in planning for or responding to marine incidents, and response contractors. Within each MaPP sub-region, a steering committee will be appointed to identify participants in GRP development, AoC identification, and GRS preparation. The steering committee may take the lead in organizing and facilitating the working group, or may hire a facilitator to manage this process. Key players for each sub-region may vary based on risks, activities, uses, and other differences between sub-regions.

Meetings

The GRP working group should be convened periodically during its development process to provide input and review for draft and final work products. The working group should be convened two to three times during the GRP development process. At a minimum, the working group should meet to get everyone on the same page regarding scope and intent of the project and to identify key information sources and knowledge-holders. The working group should also meet at the project's conclusion, to review a final GRP and its AoC designations, and GRS data and documents. Interim meetings (either of the whole GRP working group or sub-groups) may be helpful at different points in the GRP development process, such as reviewing AoC or GRS site selection. Because GRP are sub-regional plans, these meetings will require that community members travel to a central location to participate.

Areas of Concern

Determining Areas of Concern

During a marine incident, it is rarely possible to mitigate all adverse impacts or to protect all at-risk resources. The planning and preparedness process allows for methodical consideration of the entire coastline within a GRP area for the purpose of prioritizing AoC for development of GRS. As shown in the text box, this process involves weighing a range of considerations, from resource values to vulnerability and sensitivity to pollution impacts, to feasibility of deploying protective measures. There is no prescribed methodology for this process, but models from other regions utilize ranking criteria similar to those considered in the POR risk assessment process described in the Pacific Places of Refuge Contingency Plan (PORCP).

Five Steps for Determining an Area of Concern

Determination of an Area of Concern for GRS development is a five part, inter-related decision process that addresses these questions:

1. Are there social, cultural, ecological, and/or commercial values of significance?
2. Are these values vulnerable to being exposed to pollution from a marine incident, such as oil, containers, other cargos, as well as from operational activities from cleanup/salvage?
3. Are the vulnerable resources or facilities, sensitive to the pollution so as to be subject to harm?
4. Is the harmed resources capability of natural recovery, recruitment or replacement?
5. Can the area/facility be protected in a practicable and safe manner?

All five decision-factors have to be considered and rationalized to assign an Area of Concern for GRS development.

A particular AoC may not be feasibly and/or safely protected with fixed shoreline booms (*e.g.,* protection, exclusion, and/or diversion) – for example, if it is too exposed to sea conditions (*e.g.,* waves and/or currents). Nevertheless, it is still documented and mapped for its values, and this information may be used during a response to direct other mitigation efforts (outside of the GRS), such as on-water recovery or enhanced surveillance or monitoring.

Compiling Information

The process of identifying AoC typically begins as a desktop compilation of available information. When establishing an AoC for GRS preparations, cultural, ecological, and commercial factors to take into consideration include, but not limited to:

- Threatened or Endangered Species/Habitats
- Subsistence Harvest Area
- Marsh/Wetland

- Eel Grass Beds
- Sheltered Tidal Flats
- Sheltered Rocky Shores
- Seal Haul outs
- Sea Rookeries
- Large Seabird Colonies
- Waterfowl / Shorebird Concentration Area
- Anadromous Fish Stream
- Intertidal Salmon Spawning Area
- Herring Spawning Area
- Designated Park
- Ecological Reserve/Conservation Area
- Cultural Resource Site
- Designated Archaeological Site
- High Use Commercial Fishing Area
- Marine Commercial Facility
- Aquaculture Facility
- High Use Recreational Area

Some of the tools to use for AoC scoping effort can include:

- MaPP sub-regional Marine Plan
- MaPP (Sea Sketch) Marine Plan Portal[1]
- Google Earth
- Provincial Coastal Resource Information System (CRIMS) pdf maps and aerial videos
- Other available geospatial data sets or atlases

First Nation and Stakeholder Review of Resource Information

Stakeholder input is critical to identify cultural, ecological and commercial factors listed in Table 2. The MaPP process has built-in mechanisms for stakeholder input through its *Regional Marine Advisory Committee* (RMAC) and sub-regional *Marine Plan Implementation Advisory Committees* (MIPAC). These standing committees should be involved in the AoC designation and scoping process, along with any additional stakeholders for each GRP area.

Once the first cut of AoC have been selected and considered feasible and safe to protect, it is worthwhile to bring other interested parties to the table for input and support. They can include: resource agencies from local, provincial, and federal governments; local industry and their

[1] The MaPP Marine Plan Portal, using the SeaSketch application, is a geospatial data visualization tool with more than 250 data layers for the MaPP study area including administrative boundaries, species, habitats and marine uses. Website: http://mappocean.org/resources/marine-planning-portal/

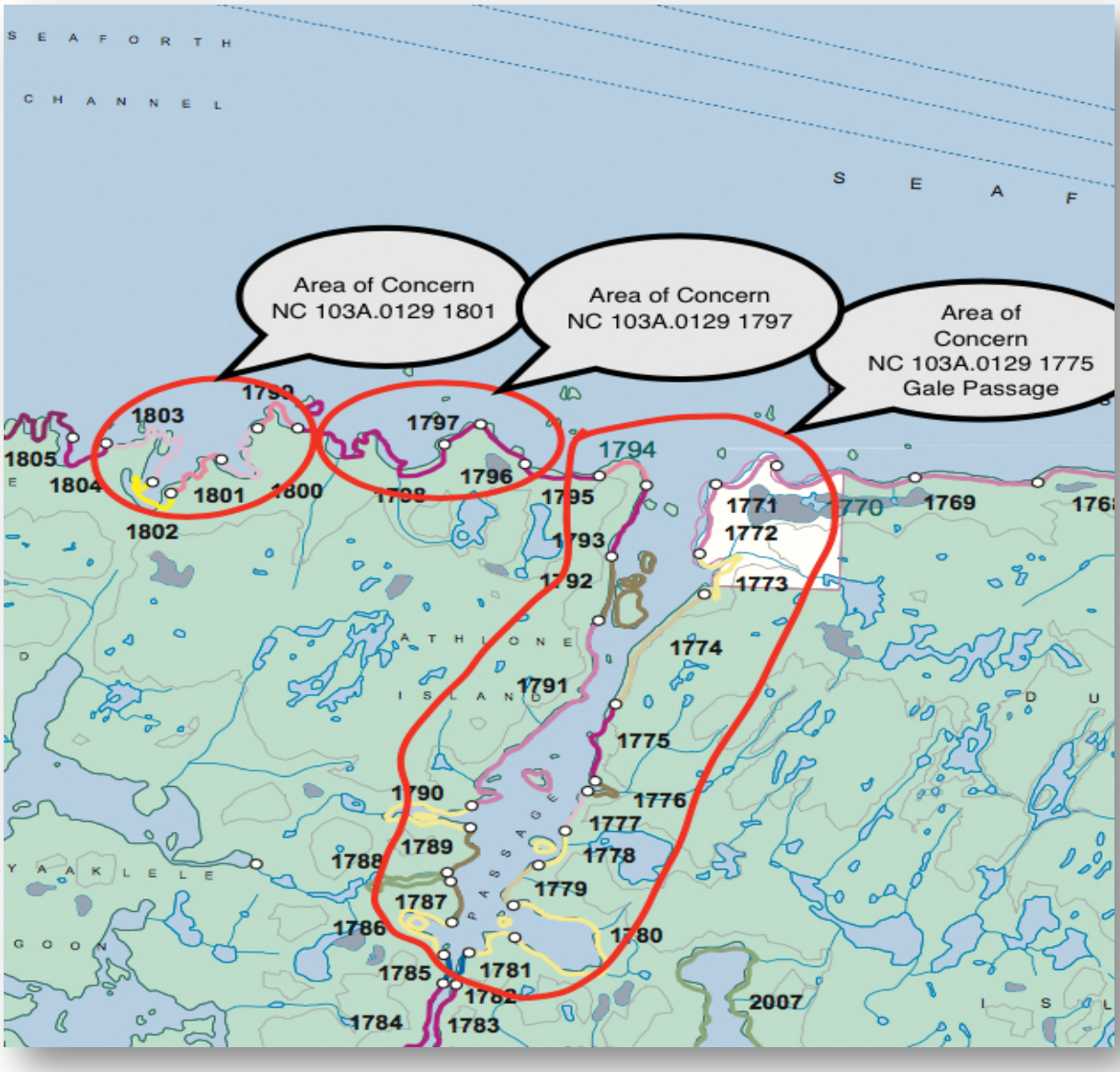


Figure 4*: Example of Areas of Concern Mapping from CRIMS*

contracted services for spill response and salvage operations. Figure 4 shows an example of a mapped AoC using a CRIMS pdf map.[2]

AoC that are identified through the planning process will serve to focus the GRS development. Prioritization of AoC by First Nations communities helps to focus initial GRS development efforts. GRS may or may not be developed within every AoC, based on a number of factors such as budget, staff time, and operational feasibility.

[2] Provincial Coastal Resource Information System (CRIMS) pdf maps or provided by GeoBC. There are about 2000 of them that covers BC's 29,000 kilometers of coast line as a "matrix".

Prioritizing AoC for Development of GRS

After AoC have been identified and vetted through First Nation and coastal community stakeholders, government, and technical experts, they are then prioritized for GRS development based on three general considerations:

- **Vulnerability** to marine incident impacts;
- **Sensitivity** to marine incident impacts; and
- **Feasibility** of protecting sites within the AoC with existing tactics, strategies, and technologies.

Figure 5 summarizes this process.

Vulnerability

The vulnerability of ecological, cultural, or commercial values within the AoC describes the likelihood that a marine incident would effect those values. The vulnerability of a site to marine incident impacts may be evaluated based on a number of factors, including the type and severity of marine incident risks. The location and exposure of a site, proximity to vessel traffic lanes or shore side facilities, and a range of other factors influence vulnerability. A formal or quantitative risk assessment is not necessary; the vulnerability assessment can be compiled through informal or qualitative techniques such as local knowledge or past-case studies. For marine spill risks, it is useful to understand prevailing winds, tides, and currents as these can be important drivers for floating pollution trajectories - whether oil, hazardous substances, shipping containers, or other cargo debris.

Sensitivity

Values that are vulnerable to marine incident impacts may vary in their sensitivity to those impacts. The sensitivity of the ecological, cultural, or commercial values associated with an AoC is determined by evaluating how severely a marine incident could damage or harm those values. In other words, certain types of marine incidents may be more or less damaging to the values within an AoC. If these values are highly vulnerable to marine incidents, but have a low sensitivity, then they may not be a high overall protection priority. Evaluating sensitivity requires a consideration of the potential consequences of various types of marine incidents. For example, there are many established methodologies for comparing the sensitivity of different shoreline types to adverse impacts from oil spills.

Feasibility

Once the sensitivity and vulnerability of cultural, ecological, and commercial values have been evaluated within an AoC, the next step is to consider whether it is operationally feasible and safe to enact protective measures aimed at mitigating adverse impacts. This process should take into consideration the operating environment - waves, currents, access points, communications

infrastructure, and more. This requires expertise from spill responders, marine salvage professionals, and other incident responders. Some of the tools for this feasibility analysis can include:

- Current maps
- Wind data
- Local knowledge on site access, navigational hazards, etc.
- Response equipment specifications on tolerances to wind and currents

Subject matter experts with experience in marine incident response and mitigation should be consulted, as well as local knowledge holders, to determine operational feasibility and limitations.

Prioritization Process

The prioritization process, like the initial designation of an AoC, must reflect both value judgments by First Nation and coastal community stakeholders along with practical considerations, such as available funding and timing. If for example, one hundred AoC are identified in a GRP area, but the project goals are to develop thirty GRS sites, there are several approaches to narrowing down the sites based on agreed-upon priorities. It is important to understand that ***just because an Area of Concern is not selected for GRS development, this does not mean that this site should not be protected in the event of a marine incident.*** Conversely, development of a GRS for a given AoC does not mean that it takes priority over non-GRS sites during an actual marine incident such as an oil spill. Establishing response priorities regarding which sites get protected is done during an incident based on the nature of pollution (*e.g.,* oil, cargo), its trajectory and exposures (See Section 3), and logistical needs. Lastly, it should be recognized that the protection measures (equipment, people) and the overall GRP preparedness (*e.g.,* notifications, logistics, *etc*.) serves the entire GRP area.

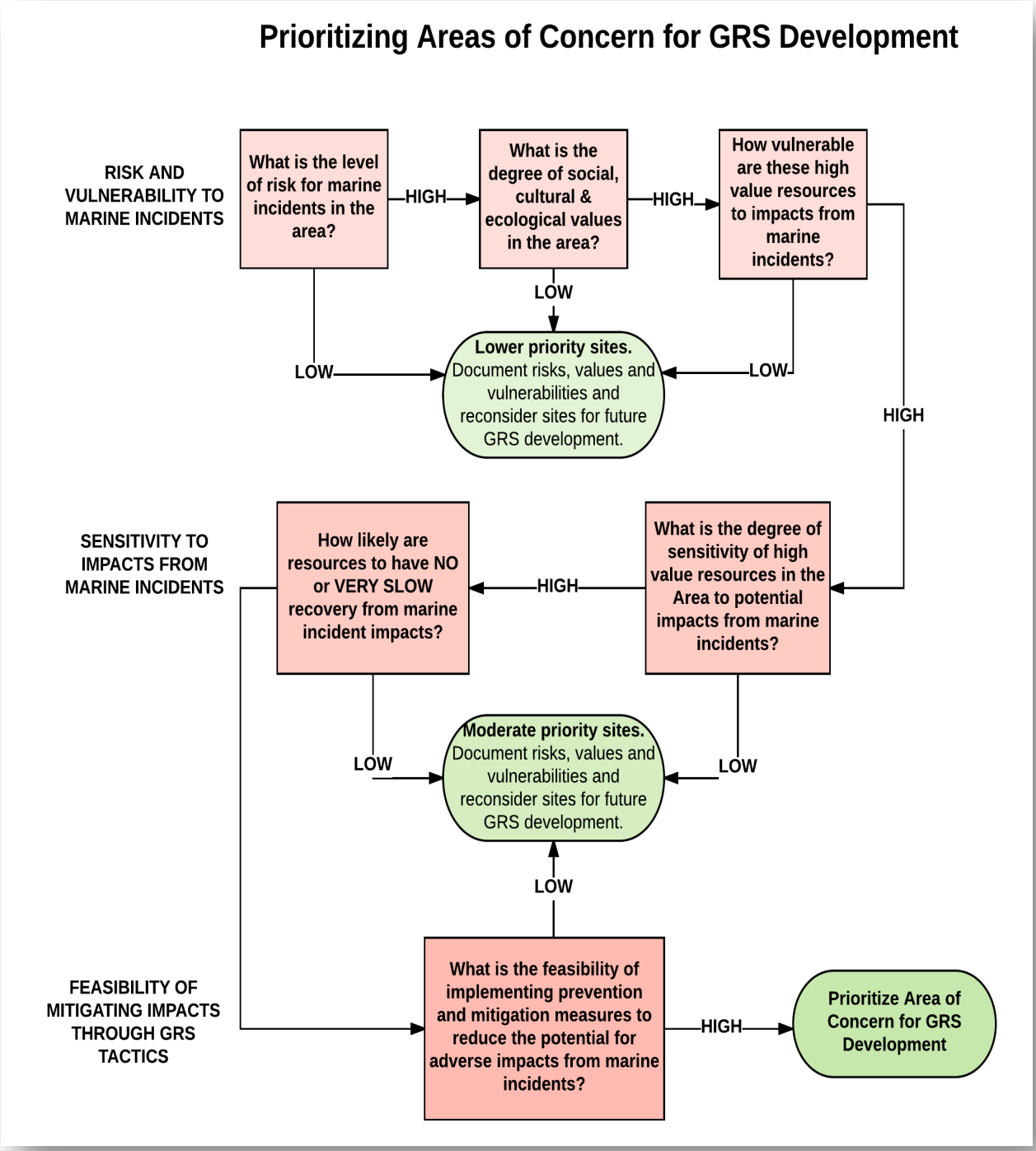


Figure 5: *Prioritizing Areas of Concern for GRS Development*

Field Surveys

Once prospective GRS sites have been identified, they should be field-surveyed to confirm information collected during the prioritization process, and to evaluate specific response tactics. Potential GRS sites are visited in the field to confirm information compiled through other sources, evaluate the logistics and practicality of site access, and identify potentially effective mitigation and response tactics. First Nation and coastal community participation is critical to provide local knowledge and validate values. Field surveys should also include qualified contractors with spill response, tactical planning, salvage, and other operational specialties.

Information gathered during field surveys includes: access and egress factors, equipment staging options, images and videos of shore substrates and geomorphology. Booming and salvage strategies are then developed and mapped as multiple operational tactics. GPS coordinates are collected, along with field sketches and detailed notes about the site and the conditions at the time of survey. It is important to consider tide cycle, predominant winds, and other environmental and oceanographic characteristics that might influence the selection of response tactics.

The evaluation of a GRS site should consider a range of environmental emergencies, including oil spills, marine incidents such as cargo loss (*e.g.,* containers, chemical, wood products), and other environmental or technological disasters that could harm coastal resources or communities (e.g., seismic and severe storm events).

Tools and resources that are used in the field for GRS development includes, but not limited to:

- Resource sensitivity maps and data compiled during AoC process.
- Nautical charts and topographic maps.
- Hazard maps such as for tsunami exposures.
- Measuring equipment such as range-finders, tape measurers, handheld GPS.
- Video and still-photo cameras, including those that can capture 360^{O} views.

Table 3 contains an example of a GRS site survey field data collection form.

Table 3: **Example of Field Data Collection Form for use in Developing GRS**

Field Team Briefing

1. Consider and discuss: hazards to the survey team; communication; survey plan and schedule.
2. Survey the site in one of two modes:
   a. Terrestrial survey – inspect terrain and adjacent water bodies, this involves walking along the intertidal and supralittoral zones while taking not to damage sensitive areas or disturb wildlife.
   b. Marine survey – inspect the water body and adjacent shoreline from the vessel while taking care not to damage sensitive areas or disturb wildlife.
3. Consider obstacles to site access and anchoring (e.g. reefs, wetlands, steep banks).
4. Identify, locate and map resources at risk
5. Identify likely spill trajectories that could impact the site.
6. Consider appropriate spill response tactical options.
7. Consider and map boom anchoring locations and measure boom array distances.
8. If current measurements are needed for developing fixed booming strategies, use GPS drogue to identify water circulation patterns, this involves dropping the gps drogue into the water and allowing it to collect current direction and speed for 20 to 30 minutes and then retrieving the drogue.
9. Consider hazards to spill responders and the public.
10. Identify preferred and alternate site access routes and modes of transportation.
11. Consider and map shoreside spill collection locations and debris accumulation locations.
12. Consider and map staging areas.
13. Collect geo-reference digital photography and fill out survey forms.

GRS Survey Field Data Collection Fields

Date: dd/mm/yyyy	Likely spill sources:	Tactic Name:	Response resources:
Time: hh:mm	Resources at risk:	Location (way points):	Boom type
Site name:	Communications check:	Response strategy:	Boom length
Survey crew:	Site access:	Implementation:	Anchors
Tidal height and stage:	Staging areas:		Vessels
Currents:	Restricted areas:		Vehicles
Water depths:	Debris accumulation:		Special considerations
Anchoring:			Photos

GRS Strategies and Tactics

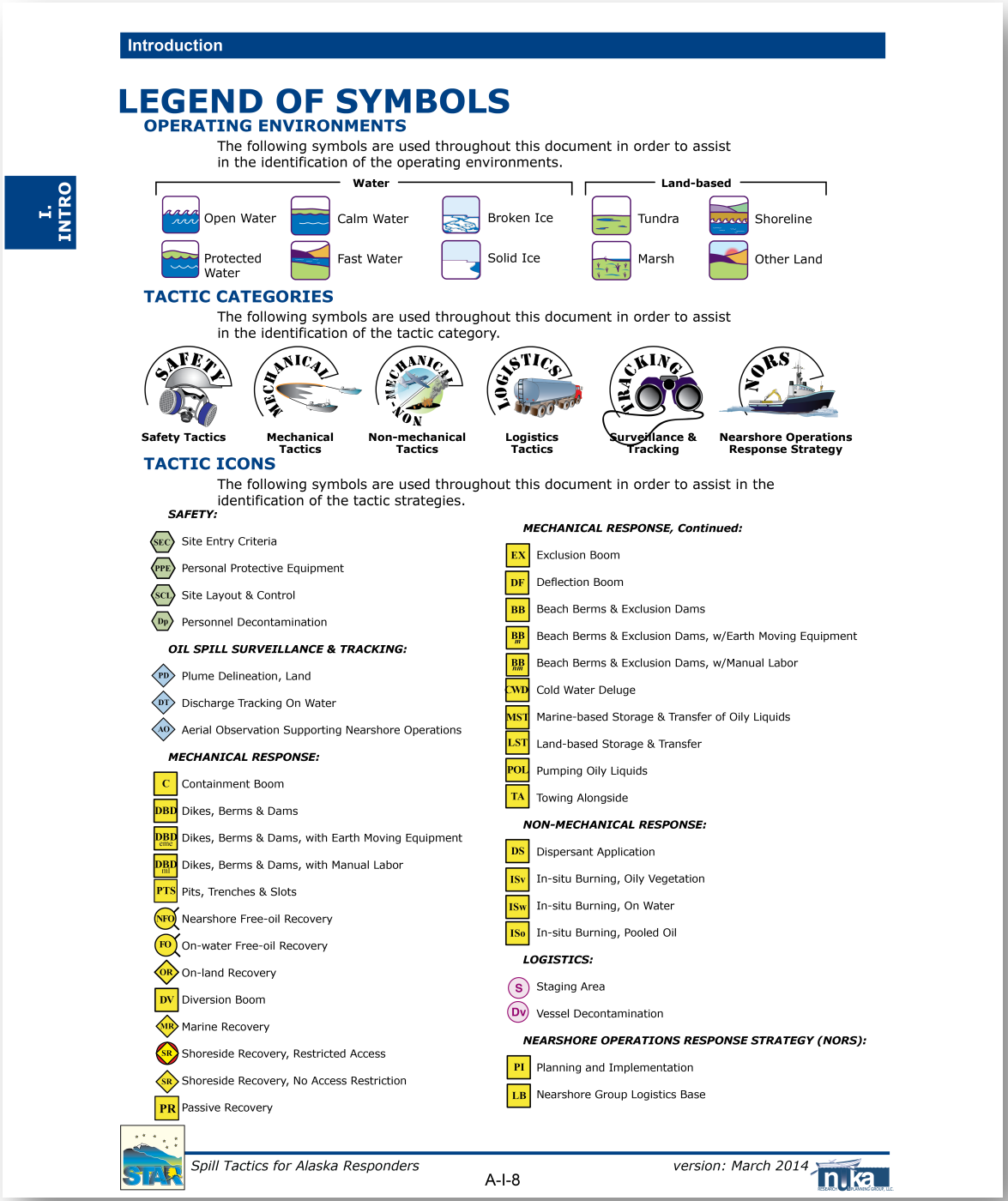
A GRS provides strategies (mitigation/prevention opportunities) which are a collection of tactics (mitigation/prevention measures), as well as other information designed to give responders guidance about why, what, and how to protected the value(s) identified. The objective is to mitigate impacts

to valued, sensitive, and vulnerable resources to the greatest extent in the first few hours following a marine incident. These can be actions to salvage, control, contain, redirect, or collect the released material (*e.g.,* oil, cargos) before they damage valuable resources or facilities. Prevention and mitigation tactics are specific to source, product, local environmental conditions, and what is being protected.

Tactics and Techniques

Before GRS are developed, it is useful to have a standard framework for the types of tactics, strategies, and equipment that are available an appropriate for the GRP area. Standard tactics guides are typically specific to oil spill response, but could be expanded to include other hazards. The most comprehensive tactics guide in the public domain is the *Spill Tactics for Alaska Responders* (STAR) manual, which contains tactics that span safety, logistics, and various types of cleanup options.[3] A series of companion videos have also been developed to train local first responders. Figure 6 shows the legend of symbols from the STAR Manual. Many of these icons are carried through to Alaska GRS, making it easy for planners and responders to refer back and forth on how to implement various tactics and plan for resource needs, both in GRS and during response. Figure 7 shows an example of a tactics description and how to use the information.

[3] http://dec.alaska.gov/spar/ppr/star/docs.htm



Introduction

I. INTRO

LEGEND OF SYMBOLS

OPERATING ENVIRONMENTS

The following symbols are used throughout this document in order to assist in the identification of the operating environments.

Water

- Open Water
- Calm Water
- Broken Ice
- Protected Water
- Fast Water
- Solid Ice

Land-based

- Tundra
- Shoreline
- Marsh
- Other Land

TACTIC CATEGORIES

The following symbols are used throughout this document in order to assist in the identification of the tactic category.

Safety Tactics | Mechanical Tactics | Non-mechanical Tactics | Logistics Tactics | Surveillance & Tracking | Nearshore Operations Response Strategy

TACTIC ICONS

The following symbols are used throughout this document in order to assist in the identification of the tactic strategies.

SAFETY:

- SEC Site Entry Criteria
- PPE Personal Protective Equipment
- SCL Site Layout & Control
- Dp Personnel Decontamination

OIL SPILL SURVEILLANCE & TRACKING:

- PD Plume Delineation, Land
- DT Discharge Tracking On Water
- AO Aerial Observation Supporting Nearshore Operations

MECHANICAL RESPONSE:

- C Containment Boom
- DBD Dikes, Berms & Dams
- DBD ctec Dikes, Berms & Dams, with Earth Moving Equipment
- DBD m Dikes, Berms & Dams, with Manual Labor
- PTS Pits, Trenches & Slots
- NFO Nearshore Free-oil Recovery
- FO On-water Free-oil Recovery
- OR On-land Recovery
- DV Diversion Boom
- MR Marine Recovery
- SR Shoreside Recovery, Restricted Access
- SR Shoreside Recovery, No Access Restriction
- PR Passive Recovery

MECHANICAL RESPONSE, Continued:

- EX Exclusion Boom
- DF Deflection Boom
- BB Beach Berms & Exclusion Dams
- BB ctec Beach Berms & Exclusion Dams, w/Earth Moving Equipment
- BB m Beach Berms & Exclusion Dams, w/Manual Labor
- CWD Cold Water Deluge
- MST Marine-based Storage & Transfer of Oily Liquids
- LST Land-based Storage & Transfer
- POL Pumping Oily Liquids
- TA Towing Alongside

NON-MECHANICAL RESPONSE:

- DS Dispersant Application
- ISv In-situ Burning, Oily Vegetation
- ISw In-situ Burning, On Water
- ISo In-situ Burning, Pooled Oil

LOGISTICS:

- S Staging Area
- Dv Vessel Decontamination

NEARSHORE OPERATIONS RESPONSE STRATEGY (NORS):

- PI Planning and Implementation
- LB Nearshore Group Logistics Base

Figure 6. *Example of Legend of Symbols from Alaska Spill Tactics Manual*

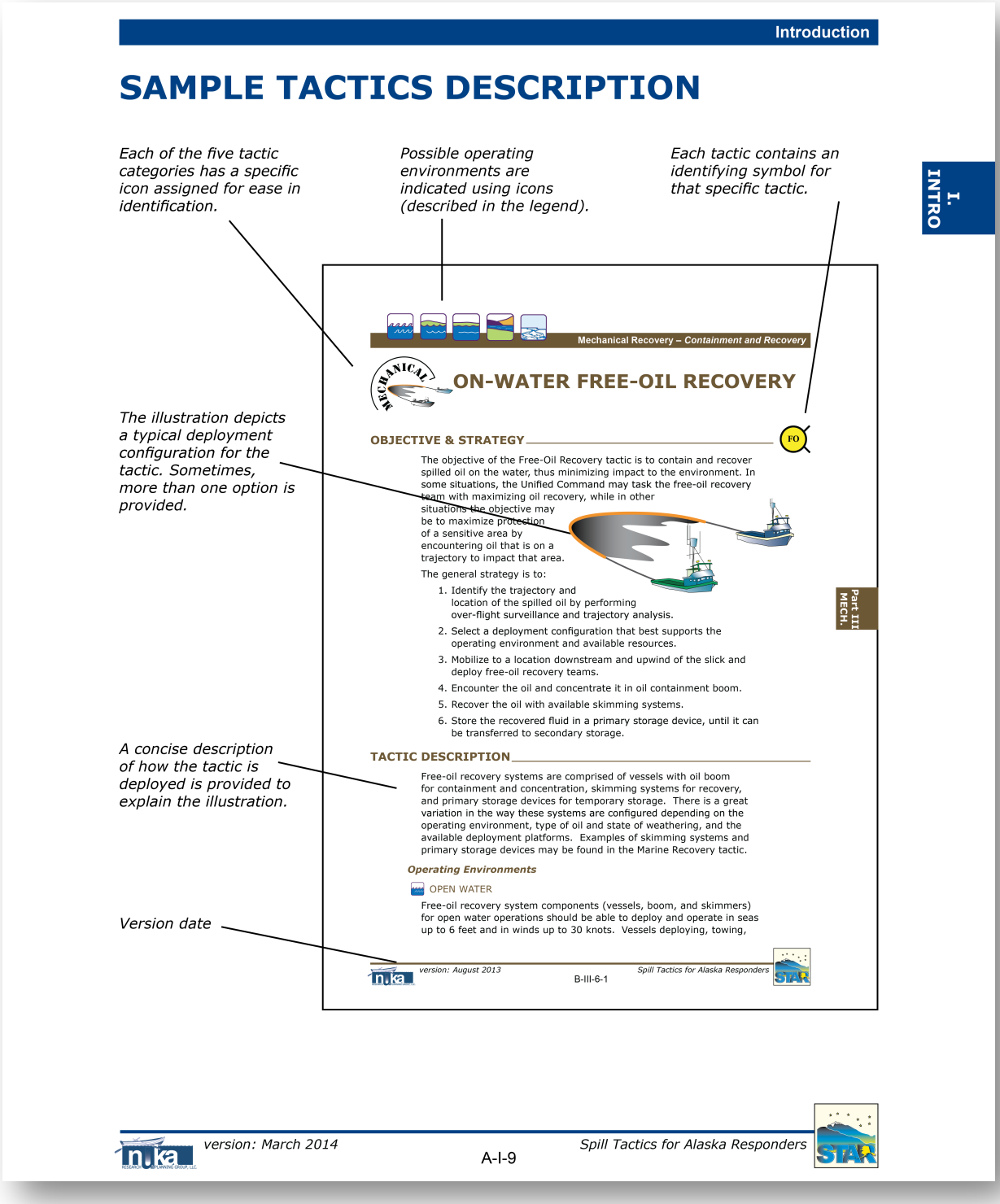


Figure 7. *Example of Tactics Description from Alaska Spill Tactics Manual*

Applying Tactics to GRS Sites

During the GRS site surveys, survey team members will discuss potential tactics and techniques to achieve the protection goals for each site. This process is the first step in drafting the GRS tactics. In the field, this is often done with sketches on base maps, although it can also be done using computer mapping programs or other tools. It is less important how the information is captured, and more important that the tactics developed represent sound, feasible techniques that fit the working environment (*e.g.,* water depths, bathymetry, wave exposures, currents, hazards, *etc.*).

The field survey notes and sketches are brought back to an office setting, and used to create the first draft of a GRS document. Once a GRS has been compiled, there is typically a review process that includes, at a minimum, First Nations, the GRP working group, and the site survey team. In some US jurisdictions, draft GRS are published for public review. A dedicated GRP/GRS website helps with the outreach process to by providing mapped AoC and associated draft and final GRS for comment and consideration.

GRP/GRS Approval Process for MaPP Region

Since this is the first collaborative GRP/GRS project to be undertaken in BC, it will be critical to ensure a robust and transparent review process of final documents. A key aim of this approach is to ensure that all project participants and their constituents understand and buy into designated AoC and their final GRS. This is fundamentally different than the approach that has been taken to develop GRP and GRS in BC to date, which has been industry-led with minimal stakeholder participation or buy-in. Through their active role in the GRP/GRS development process, coastal communities, provincial and federal agencies, and stakeholders share ownership of the final plans and products, and should be able to assure their members and organizations that these are consistent with their social, cultural, ecological, commercial and other coastal values.

The GRS development process described here is collaborative and will require additional time and resources to develop, but experience from other jurisdictions (and within Canada) has shown that marine incident response and protection plans that are developed without First Nations and coastal communities as partners in the development process can be met with suspicion or distrust at the time of a marine incident. By comparison, plans and products that are conceived and developed from the ground up may be viewed positively as supporting First Nations in their roles as steward of natural resources and cultural heritage.

The GRS development process used to create the site-specific plans is necessarily iterative, and will provide several opportunities for project participants to review and comment on draft work products. The partners steering the work group process will sign-off on final plans, which will then be incorporated as appropriate into local, First Nation, provincial, and federal marine incident response frameworks.

Format and Publication of GRS

GRS Structure and Content

A completed GRS document typically includes a map or chart illustrating the site location, protective tactics, access and staging information, and other geographic information. In addition to the map or illustration, there is typically a text table with additional information about deployment considerations, safety, access, logistics, resource sets, and notifications. The text is succinct to guide responders in the field. Site photographs from various angles can help to orient responders to the site.

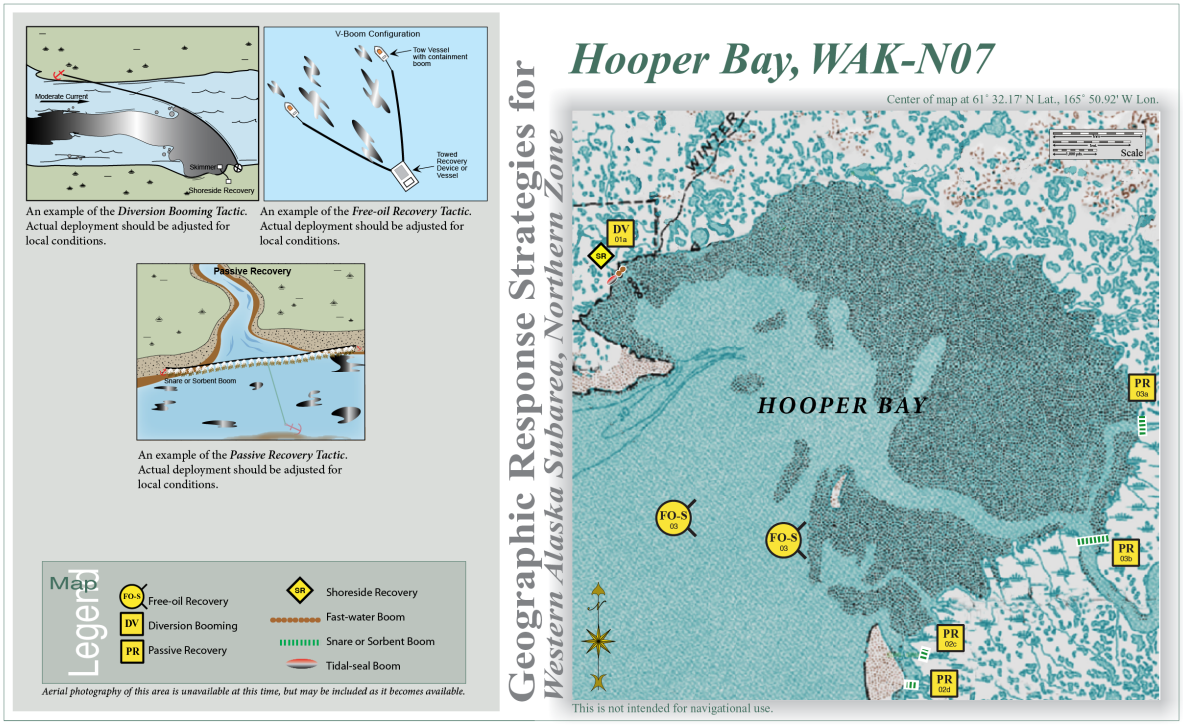
Additional information may be captured during the GRS field-work such as videos and images that are not part of the hard-copy (pdf) GRS document. These may be reviewed by operations and planners at the on-set of a marine incident and prior to field-deployments so as to create a thorough "operational picture" - a picture is worth a thousand words, a video even more.

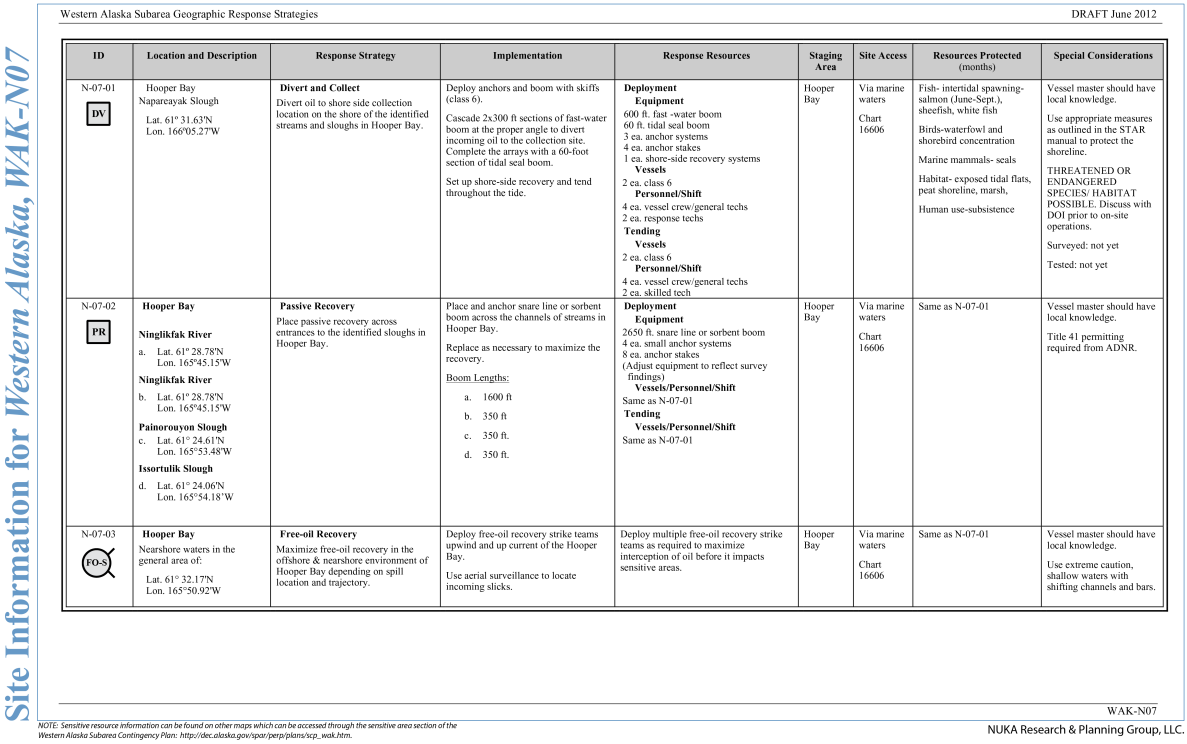
While an effective GRS can take many forms, it is important to develop a standardized approach or template that will be consistently applied across the region. There are several examples of GRS formatting approaches from other jurisdictions in the US and worldwide. The recommended approach for the MaPP region is to use a format similar to the Pacific Places of Refuge (POR) plans, which are a two-page document formatted on ledger/tabloid-size (432 x 279 mm /11 x 17-inch) paper. An example of an Alaska GRS is shown in Figure 8.[4] The specific categories of information to be included in the MaPP GRS may vary based on differences between the US and Canadian context, and the local response capabilities and considerations in the MaPP region.

In addition to a static GRS document (which may be printed on paper from a PDF document), there is can also be geospatial data developed using a GIS tool such as ArcGIS or Google Earth. These data include attributes for tactics and strategies, field-generated products such as notes, forms, videos and images, and logistics or infrastructure data (*i.e.,* boat ramps, roadways, access points, staging areas, *etc).*

If GRS information in presented geospatially, it can be viewed, displayed, or manipulated in both the planning and response context. For example, in Massachusetts, GRS information can be viewed through the state's online mapping tool by "turning on" data layers for booms, tactics, staging areas, and other points. The screen shot in Figure 9 shows how multiple GRS tactics in Boston Harbor can be displayed by zooming and panning. At a certain zoom level, individual tactics become visible. The "T" icons indicate pre-positioned spill response trailers. Figure 10 shows the corresponding GRS (called "GRP" due to different nomenclature) for a single site within Winthrop Harbor, shown on the inset indicator map as site BH-01. This is an example of the static version of a GRS that contains additional information to be used in the field by responders

[4] Full resolution version available for download at: https://dec.alaska.gov/spar/ppr/grs/wa/WAK_N07HB.pdf





Site Information for Western Alaska, WAK-N07

Western Alaska Subarea Geographic Response Strategies — DRAFT June 2012

ID	Location and Description	Response Strategy	Implementation	Response Resources	Staging Area	Site Access	Resources Protected (months)	Special Considerations
N-07-01 DV	Hooper Bay Napareayak Slough Lat. 61° 31.63'N Lon. 166°05.27'W	**Divert and Collect** Divert oil to shore side collection location on the shore of the identified streams and sloughs in Hooper Bay.	Deploy anchors and boom with skiffs (class 6). Cascade 2x300 ft sections of fast-water boom at the proper angle to divert incoming oil to the collection site. Complete the arrays with a 60-foot section of tidal seal boom. Set up shore-side recovery and tend throughout the tide.	**Deployment** **Equipment** 600 ft. fast -water boom 60 ft. tidal seal boom 3 ea. anchor systems 4 ea. anchor stakes 1 ea. shore-side recovery systems **Vessels** 2 ea. class 6 **Personnel/Shift** 4 ea. vessel crew/general techs 2 ea. response techs **Tending** **Vessels** 2 ea. class 6 **Personnel/Shift** 4 ea. vessel crew/general techs 2 ea. skilled tech	Hooper Bay	Via marine waters Chart 16606	Fish- intertidal spawning-salmon (June-Sept.), sheefish, white fish Birds-waterfowl and shorebird concentration Marine mammals- seals Habitat- exposed tidal flats, peat shoreline, marsh, Human use-subsistence	Vessel master should have local knowledge. Use appropriate measures as outlined in the STAR manual to protect the shoreline. THREATENED OR ENDANGERED SPECIES/ HABITAT POSSIBLE. Discuss with DOI prior to on-site operations. Surveyed: not yet Tested: not yet
N-07-02 PR	**Hooper Bay** **Ninglikfak River** a. Lat. 61° 28.78'N Lon. 165°45.15'W **Ninglikfak River** b. Lat. 61° 28.78'N Lon. 165°45.15'W **Painorouyon Slough** c. Lat. 61° 24.61'N Lon. 165°53.48'W **Issortulik Slough** d. Lat. 61° 24.06'N Lon. 165°54.18'W	**Passive Recovery** Place passive recovery across entrances to the identified sloughs in Hooper Bay.	Place and anchor snare line or sorbent boom across the channels of streams in Hooper Bay. Replace as necessary to maximize the recovery. Boom Lengths: a. 1600 ft b. 350 ft c. 350 ft. d. 350 ft.	**Deployment** **Equipment** 2650 ft. snare line or sorbent boom 4 ea. small anchor systems 8 ea. anchor stakes (Adjust equipment to reflect survey findings) **Vessels/Personnel/Shift** Same as N-07-01 **Tending** **Vessels/Personnel/Shift** Same as N-07-01	Hooper Bay	Via marine waters Chart 16606	Same as N-07-01	Vessel master should have local knowledge. Title 41 permitting required from ADNR.
N-07-03 FO-S	**Hooper Bay** Nearshore waters in the general area of: Lat. 61° 32.17'N Lon. 165°50.92'W	**Free-oil Recovery** Maximize free-oil recovery in the offshore & nearshore environment of Hooper Bay depending on spill location and trajectory.	Deploy free-oil recovery strike teams upwind and up current of the Hooper Bay. Use aerial surveillance to locate incoming slicks.	Deploy multiple free-oil recovery strike teams as required to maximize interception of oil before it impacts sensitive areas.	Hooper Bay	Via marine waters Chart 16606	Same as N-07-01	Vessel master should have local knowledge. Use extreme caution, shallow waters with shifting channels and bars.

WAK-N07

NOTE: Sensitive resource information can be found on other maps which can be accessed through the sensitive area section of the Western Alaska Subarea Contingency Plan: http://dec.alaska.gov/spar/perp/plans/scp_wak.htm.

NUKA Research & Planning Group, LLC.

Figure 8. *Example of GRS from Alaska*

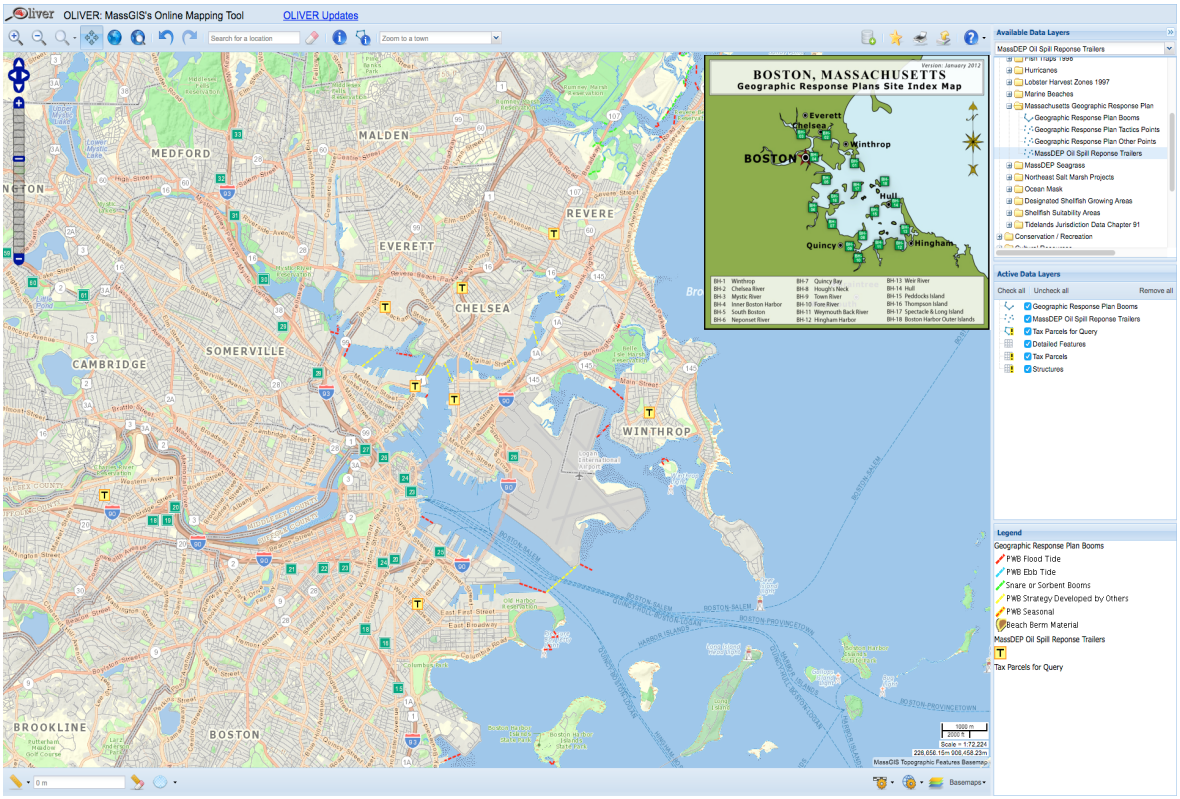


Figure 9. *Example of Online GRS viewer from Massachusetts*

Figure 10. *Example of Static (Paper) form of same Massachusetts GRS site as shown in online viewer in Figure 9*

3. INTEGRATING GRP/GRS INTO MARINE INCIDENT PLANNING IN THE MAPP REGION

Applying GRP During Marine Incidents

GRP and GRS are primarily used in the "emergency" phase of an escalating marine incident, as the plans focus on pre-impact activities rather than post-impact cleanup or response. The GRP – which includes regional information along with site-specific GRS – guides initial responders and response managers in the first day or two of a major marine incident. Depending upon the nature and severity of the incident, local responders and resources may eventually be replaced when additional resources and responders arrive from outside the region or country.

While GRP focus on the early stages of an incident, information in a GRP continues to be useful as the response progresses. For example, information about resource sensitivities in a coastal area may be useful post-impact during the shoreline cleanup and assessment process. This information can also be used to manage workforce impacts to certain sites during cleanup operations, and to support field crew logistics and site access.

GRP components can be printed and posted for quick reference in the office or an ICP. GRP maps and imagery may contribute to situational awareness.

While the GRS development process involves a prioritization of sites within AoC for development of plans, it is important to distinguish this prioritization process – which is carried out during the planning process – with the prioritization process that occurs during an incident response. The text box below explains how prioritization is managed within an incident response.

Establishing GRS Priorities for Protection

Priorities for coastal resource protection during a marine incident - such as a vessel casualty - are established during the event. Under the Incident Command System, it is the mission of the Planning Section's Environmental Unit to assess the situation (*e.g.,* pollution source and type, its trajectory and exposures) and then to list coastal areas in order of priority for protection undertaken by the Operations Section. These can be areas of concern to First Nations, companies (aquaculture farms, marinas), other resource management agencies. These recommended priorities are provided to Unified Command - with First Nations and other government representation - for approval. Once approved, they are incorporated in an Incident Action Plan that has work assignments.

Pre-established Areas of Concern expedites the priority list for operations. Their GRS guide how and want can be done to prevent or mitigate impacts. However, not all Areas of Concern may be addressed at once, as there may not be enough response equipment and people. As such, those with the highest priority are given first attention. For Areas of Concern with no GRS, more focus is given to on-water operations to contain and remove oil or other contaminates from reaching this site.

Alignment with Ongoing Marine Planning Initiatives

The GRP/GRS process described in this guide builds from the substantial marine use planning that has already been completed through MaPP. However, there are other planning initiatives that relate to GRP/GRS development, and the approach proposed in this guide can be integrated with BC's Spill Response Initiative and Canada's commitment to area response planning. The GRP/GRS sub-regions already align with the sub-regional planning boundaries for Places of Refuge planning in BC.

Testing and Exercises

Best practice for GRS development holds that no strategy or tactic is final until it has been tested and verified under real-world conditions. In practice, most GRS in other jurisdictions are periodically revised based on the outcome of deployment drills, exercises, or actual events. This process also has a substantial training value, in that GRS deployments can be used to build competence among local responders.

Developing GRS is time consuming and labour intense and can be a multi-year or phased endeavor that incorporates early field verification of certain sites to inform the process.

Capacity Building and Buy-in

The GRP and GRS development process includes cataloguing local capacity, such as equipment, vessels, infrastructure, and trained personnel. Once the GRS are developed, they can be used to evaluate local response capacity by considering where resources to deploy the tactics are stored and how quickly they can be deployed on scene. GRP and GRS also provide an important opportunity to ground truth local capacity building, and contribute to plans for training and for investments in equipment or infrastructure. Collaborative GRP development also creates local buy-in to the process, because the plans reflect their input and provide a pathway for local community members to be proactive in protecting their high value resources from marine emergencies.

4. REFERENCES AND ADDITIONAL RESOURCES

References

2017 (MaPP) *Regional Strategy for Marine Incident Response Planning and Preparedness.* Prepared by Marine Plan Partnership for the North Pacific Coast

2015 IPIECA-OGP *Tiered preparedness and response: Good practice guidelines for using the tiered preparedness and response framework*

Websites from Other Jurisdictions with GRP/GRS

State of Alaska (Department of Environmental Conservation):

- Geographic Response Plans: http://dec.alaska.gov/spar/PPR/plans/scp_al.htm
- Geographic Response Strategies: http://dec.alaska.gov/spar/ppr/grs/home.htm
- Potential Places of Refuge: http://dec.alaska.gov/spar/ppr/ppor/home.htm
- GRP/GRS Internet-base (User interactive) map viewer (Cook Inlet Response Tool): http://portal.aoos.org/cirt
- Spill Tactics for Alaska Responders manual and spill response videos for rural communities: http://dec.alaska.gov/spar/ppr/star/docs.htm

State of Washington (Department of Ecology):

- Geographic Response Plans with Geographic Response Strategies: http://www.ecy.wa.gov/programs/spills/preparedness/GRP/
- GRP/GRS Internet-base (User interactive) map viewer (Spill Map): https://fortress.wa.gov/ecy/coastalatlas/storymaps/spills/spills_sm.html

State of California (Office of Oil Spill Prevention and Response):
Geographic Response Plans: https://www.wildlife.ca.gov/OSPR/Contingency

State of Massachusetts (Office of Energy and Environmental Affairs):

- Geographic Response Plan: http://www.mass.gov/eea/agencies/massdep/cleanup/marine/massachUSetts-geographic-response-plan.html
- Internet-base (User interactive) GRP Map viewer: http://maps.massgis.state.ma.US/images/dep/omv/grpviewer.htm
- OLIVER online mapping tool with GRP data (under Coastal and Marine Features): http://maps.massgis.state.ma.US/map_ol/oliver.php

Centre of Documentation, Research and Experimentation on Accidental Water Pollution (CEDRE) is a is a not-for-profit association created in the aftermath of the Amoco Cadiz oil spill. It provides a wide-

variety of documents on both oil and chemical spills as: operational guides, manuals, guidelines, chemical response guides, technical datasheets, learning guides *etc*.

IPIECA-OPG has a number of publications that summarizes current views on good practice for a range of oil spill preparedness and response topics:
http://www.oilspillresponseproject.org

International Maritime Organization (IMO) supports an extensive programme that includes manuals, guidelines and courses on the prevention and response to marine incidents pertaining to vessels such as conventions on salvage, marine pollution, places of refuge.
http://www.imo.org/en/Pages/Default.aspx

International Tanker Owners Pollution Federation (ITOPF) has a set of 17 technical information papers and a video series related to oil pollution.

- Homepage: http://www.itopf.com
- Technical Information Papers: http://www.itopf.com/knowledge-resources/documents-guides/technical-information-papers/
- Documents and Guides: http://www.itopf.com/knowledge-resources/documents-guides/

Oil Spill Preparedness and Response Videos: http://www.itopf.com/knowledge-resources/library/video-library/

Oils Spill Response Ltd (OSRL) is an international industry-funded cooperative to respond to oil spills by providing preparedness, response and intervention services. OSRL has a series of field guides on oil spill response.

- Homepage: https://www.oilspillresponse.com
- Field Guides: https://www.oilspillresponse.com/technical-library/?tag=Field Guides
- Emergency Preparedness: https://www.oilspillresponse.com/technical-library/?tag=Information Sheets

Preparedness for Oil-polluted Shoreline Clean-up and Oiled Wildlife interventions (POSOW) provides technical manuals, posters and more:

- Homepage: http://www.posow.org
- Posters: http://www.posow.org/documentation/posters-1
- Presentations: http://www.posow.org/documentation/presentations
- Volunteer Management: http://www.posow.org/themes-1/volunteer-management

2013 West Coast Spill Response Studies prepared for the Province by Nuka Planning and Research provides key elements for a world-class system that includes spill prevention, preparedness, response and recovery:

- *Volume 1 Assessment of British Columbia Marine Oil Spill Prevention & Response Regime* (PDF 7.98MB) – An initial assessment and gap analysis of the existing marine spill prevention and response regime in place for BC
- *Volume 2 Vessel Traffic Study* (PDF 5.81MB) – A vessel traffic study assessing the current and potential levels of shipping on the west coast of Canada, and the current volume of hydrocarbons being shipped or used as fuel.
- *Volume 3 World-Class Oil Spill Prevention, Preparedness, Response & Recovery System* (PDF 4.98MB) – An analysis to identify international best practices and elements required for establishing a world class marine spill preparedness and response regime, which is one of BC's five conditions for considering heavy oil transport.

2015 *Marine Oil Spill Prevention, Preparedness, Response & Recovery - World-leading Approaches from Selected Jurisdictions* by Nuka Planning and Research provides examples of specific laws, regulations, policies and practices in place across the globe that stand out among world-class approaches to oil spill prevention, preparedness, response, and recovery.

Ministry of Environment's Spill Response Engagement References:
http://www2.gov.BC.ca/gov/content/environment/air-land-water/spills-environmental-emergencies/spill-preparedness-and-response-BC/spill-response-engagement/engagement-materials