DRAFT GREEN RIVER SUB-AREA CONTINGENCY PLAN

December 22, 2015

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GREEN RIVER SUB-AREA CONTINGENCY PLAN

1.0 INTRODUCTION

The three levels of contingency plans under the Federal National Response System are the National Contingency Plan (NCP), Regional Contingency Plan (RCP), and Area Contingency Plan (ACP). ACPs were most recently required by the Oil Pollution Act of 1990 (OPA 90). Following OPA, most EPA regions, including Region 8, added various ACP requirements into their Regional Plans, resulting in combined RCP/ACP plans. However, the area covered by the combined plans (RCP/ACP) was regional in scope and lacked localized geographic details necessary for oil spill response planning and coordination.

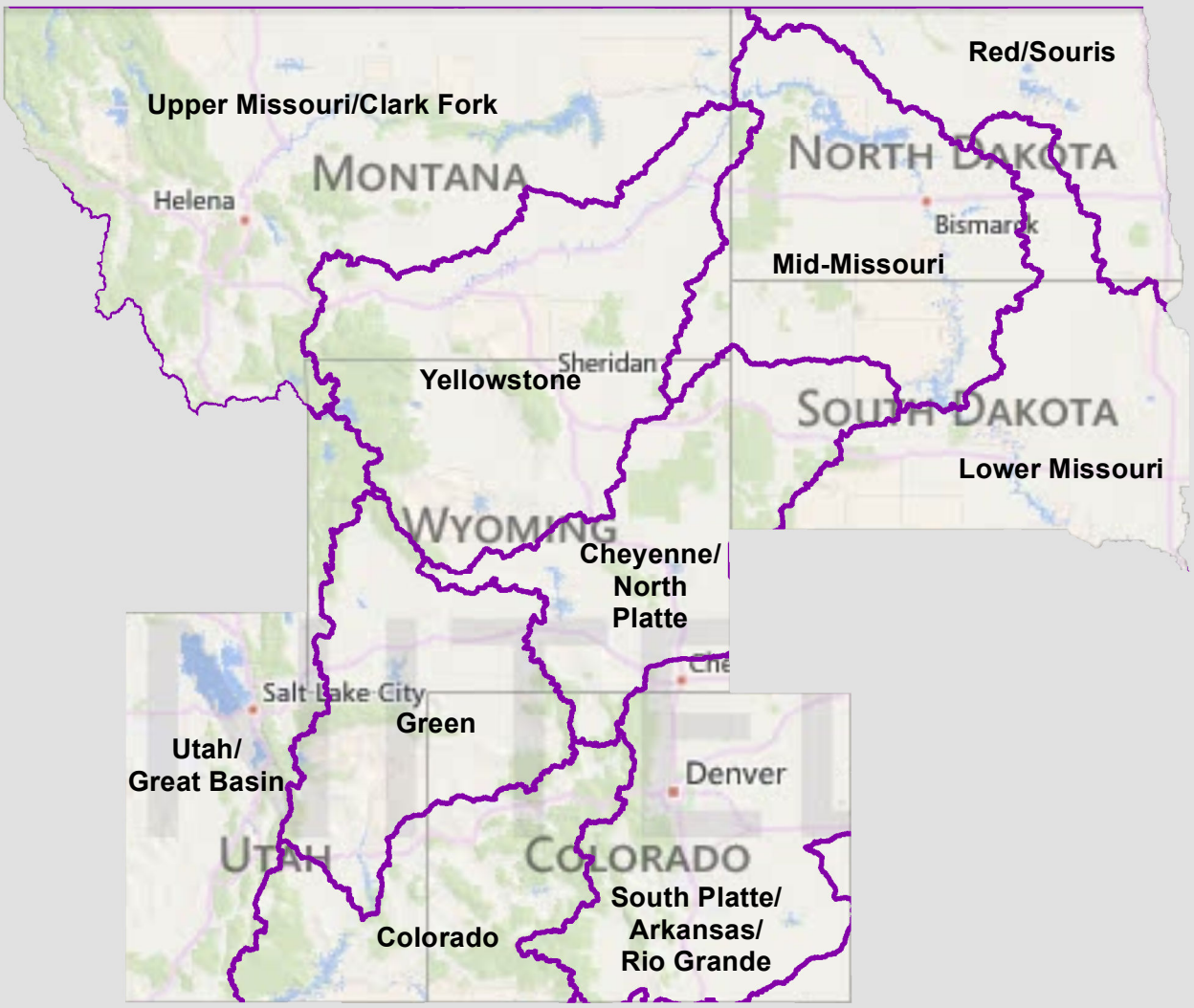
To conduct planning in localized areas, Region 8 designated 10 smaller sub-areas based on watershed boundaries for oil spill planning (Figure 1). The Sub-Area Contingency Plans (SACP) provide a greater level of tactical response planning to guide initial actions in response to major discharges of oil that threaten waters of the United States. These planning efforts focus on areas most vulnerable to oil spills. For additional detail on the area planning strategy, refer to the EPA Region 8 RCP, dated December 30, 2014. The area planning development strategy was approved by the Region 8 Regional Response Team (RRT) in August 2013. This SACP, in conjunction with the RCP, will constitute Region 8's ACP for the Green River Sub-Area. This SACP was developed via a collaborative effort of federal, tribal, state, and local agencies, as well as industry groups.

1.1 PURPOSE

OPA 90 defined the purpose of area planning as follows: "*The Area Contingency Plan shall, when implemented with the National Contingency Plan, be adequate to remove a worst-case discharge and to mitigate or prevent a substantial threat of such a discharge from a vessel, offshore facility or onshore facility operating in or near the area.*"

FIGURE 1
EPA REGION 8
SUB-AREA CONTINGENCY PLANS

TERA 2015



1.2 SCOPE

OPA 90 required that several elements be met in developing ACPs, which were later codified into the Clean Water Act (CWA) 311 (j)(4)(c) and subsequently into the NCP at 40 *Code of Federal Regulations* (CFR) Section 300.210 (c). The requirements of CWA Section 311 (j)(4)(C) are as follows:

(i) When implemented in conjunction with the National Contingency Plan, be adequate to remove a worst-case discharge[of oil] and to mitigate or prevent a substantial threat of such a discharge from a vessel, offshore facility, or onshore facility operation in or near the area;

(ii) Describe the area covered by the plan, including the areas of special economic or environmental importance that might be damaged by a discharge;

(iii) Describe in detail the responsibilities of an owner or operator and of federal, state, and local agencies in removing a discharge, and in mitigating or preventing a substantial threat of a discharge;

(iv) List the equipment (including firefighting equipment), dispersants or other mitigating substances and devices, and personnel available to an owner or operator and federal, state and local agencies to ensure an effective and immediate removal of a discharge and to ensure mitigation or prevention of a substantial threat of a discharge;

(v) Describe the procedures to be followed for obtaining an expedited decision regarding the use of dispersants;

(vi) Describe in detail how the plan is integrated into other Area Contingency Plans and vessel, offshore facility, and onshore facility response plans approved under this subsection, and into operating procedures of the National Response Unit;

(vii) Include any other information the President requires; and

(viii) Be updated periodically by the Area Committee.

Additionally, NCP Section 300.210(c)(4)(i) calls for Area Plans to incorporate a detailed annex containing a Fish and Wildlife and Sensitive Environments Plan that is consistent with Regional Plans. The EPA Region 8's Fish and Wildlife Sensitive Environments Plan is included as Annex III of the Region 8 RCP and provides information for the Federal On-Scene Coordinator (OSC) and other responders for protection of threatened and endangered species and their habitats during a response.

Within a particular geographic watershed boundary, each SACP will assess threats from facilities that could cause substantial harm to the environment by discharging into or on the navigable waters and or adjoining shorelines. Section 300.211 of the NCP identifies those facilities that "could cause substantial harm to the environment" and that must submit a Facility Response Plan (FRP) for responding to a worst-case discharge and to a substantial threat of such a discharge. Requirements for FRPs for

non-transportation related onshore facilities are specified at 40 CFR Section 112.20, and pertain to those facilities with total storage capacity exceeding one million gallons and that meet certain criteria. These facilities are regulated by the EPA and are referred to as FRP facilities. Requirements for pipeline (transportation) FRPs are specified at 49 CFR Part 194 and are regulated by the Department of Transportation (DOT). While these higher threat facilities are the focus of this planning effort, spills from smaller and more prevalent sources and facilities, such as railroads, production facilities, trucking operations, etc., could also be addressed by response strategies developed as part of this SACP. Discharges from these other potential sources may constitute a "Major Discharge" as defined in the NCP for inland waters. The SACP response strategies are expected to assist in responding to such discharges that may be more prevalent.

Although this SACP focuses on oil spill response, the successful development of this plan (and the web-based response tool discussed in this document), along with planned updates to the RCP will prepare and enhance the Region's ability to respond to both oil discharges and hazardous substance releases. This SACP and associated response strategies do not relieve operators of requirements for FRPs or other applicable regulatory compliance.

1.3 STATUTORY AUTHORITY

This SACP was prepared under the NCP, 40 CFR Part 300 and Section 311(j) of the CWA, as amended by OPA 90, 33 *United States Code* (U.S.C.) 1251 et seq.

2.0 DESCRIPTION OF SUB-AREA

This section describes the sub-area, its sensitive environments and critical infrastructure (sensitive resources), and the planning approach developed for protection of these.

2.1 WATERSHED AND CLIMATE

The Green River Basin sub-area is comprised of three watersheds: Great Divide-Upper Green, White-Yampa, and Lower Green watersheds (Figure 2). The listed watersheds are classified as Hydrologic Unit Code (HUC) 4. The sub-area encompasses central Wyoming, eastern Utah, and western Colorado. The Green River is the principal drainage system within the sub-area and the Flaming Gorge Reservoir is the largest surface water body. The Green River is dammed in Dutch John, Utah, creating the Flaming Gorge Reservoir which extends to just south of Green River, Wyoming. The Flaming Gorge Reservoir covers approximately 65 square miles and has approximately 350 miles of shoreline. Major tributaries to the Green River and Flaming Gorge Reservoir are the Blacks Fork River, Hams Fork, and Muddy Creek. Major tributaries to the Green River below the dam include the Yampa, White, Duchesne, Price, and San Rafael Rivers.

The Upper Green watershed encompasses central Wyoming, northeast Utah, and northwest Colorado. The watershed encompasses an area of 20,756 square miles. The Green and Blacks Fork Rivers, and Hams Fork Creek are the major rivers in the watershed.

The White-Yampa watershed encompasses northwest Colorado and portions of southern Wyoming and eastern Utah. The watershed covers an area of 13,259 square miles. The Yampa and White Rivers are the two major rivers in the watershed. The Little Snake River flows out of Wyoming into the Yampa River in Colorado.

The Lower Green watershed encompasses eastern Utah and a sliver of western Colorado. The watershed covers an area of 14,556 square miles. The Green River is the major river in the watershed. Tributaries within the sub-area include, the White, Duchesne, Price, San Rafael, Strawberry, and Lake Fork rivers.

There are three distinct seasons of water flow within the Green River Basin sub-area. Those are: 1) winter; 2) spring runoff or peak/high flow; and 3) base flow. The winter season is primarily from November through March when the rivers of the sub-area are covered by ice. Spring runoff, or peak/high flow, generally starts late April to early May and continues through late May to June. The period of peak flow varies year to year; however, May is generally the primary month that peak flow occurs. Base flow occurs following peak flow which is usually June/July up to the winter season.

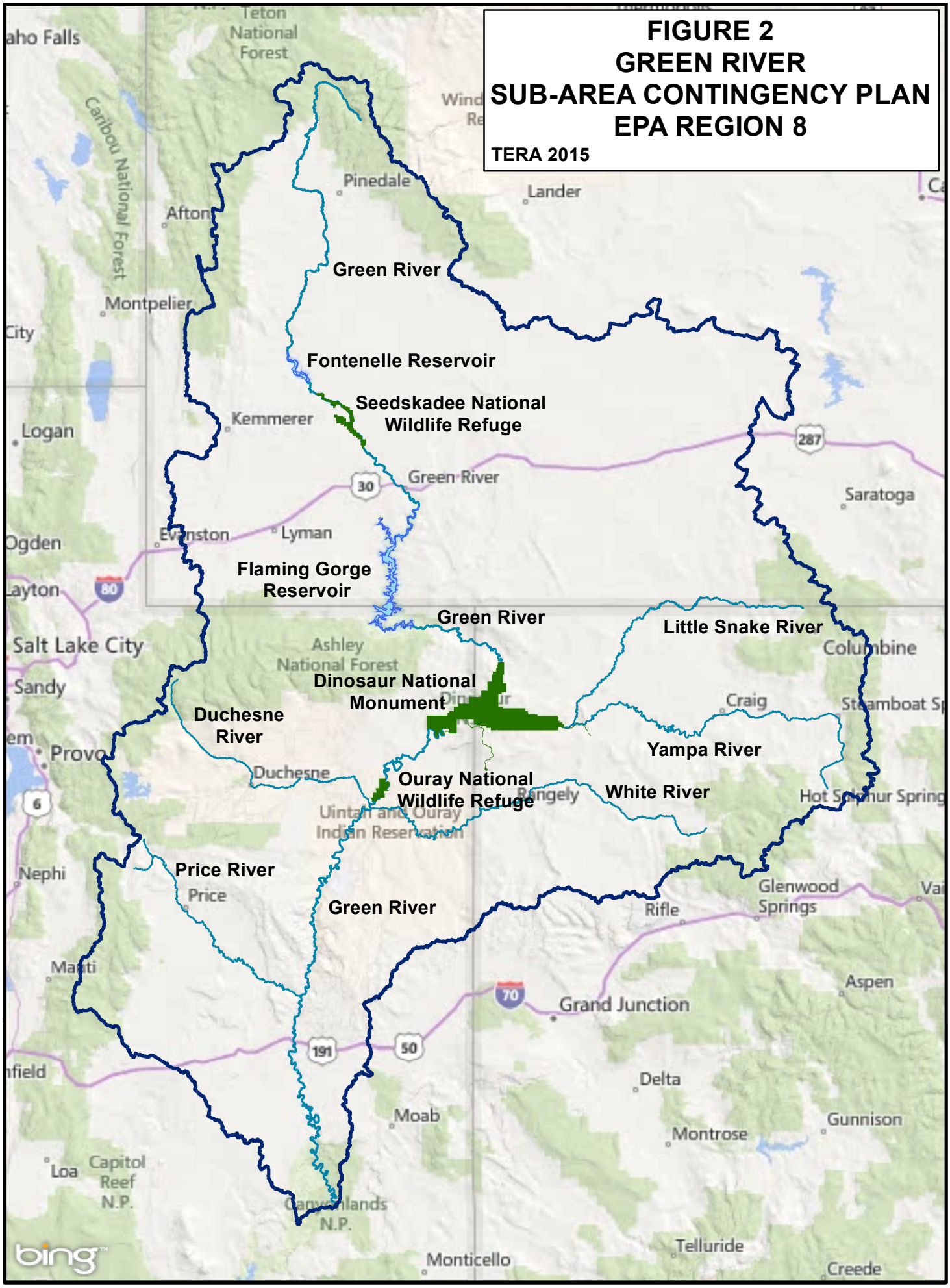


FIGURE 2
GREEN RIVER
SUB-AREA CONTINGENCY PLAN
EPA REGION 8
TERA 2015
Green River
Fontenelle Reservoir
Seedskadee National Wildlife Refuge
Flaming Gorge Reservoir
Green River
Little Snake River
Dinosaur National Monument
Duchesne River
Yampa River
Ouray National Wildlife Refuge
White River
Price River
Green River
Green River
Pinedale
Lander
Afton
Montpelier
Kemmerer
Logan
Green River
Saratoga
Evanston
Lyman
Ogden
Salt Lake City
Sandy
Provo
Duchesne
Craig
Columbine
Steamboat Sp
Hot Sulphur Spring
Rangely
Uintah and Ouray Indian Reservation
Nephi
Price
Rifle
Glenwood Springs
Aspen
Grand Junction
Delta
Moab
Gunnison
Montrose
Capitol Reef N.P.
Canyonlands N.P.
Monticello
Telluride
Creede
Teton National Forest
Caribou National Forest
Ashley National Forest
287
30
80
6
70
191
50
bing

Topography within the sub-area ranges from mountainous to fairly flat terrain with many canyons. The elevation varies from a high of 13,500 feet along the crest of the Uinta Mountains to a low of 5,000 feet in the center of the basin. Climate of the sub-area is characterized as cold, semi-arid, with large seasonal fluctuations in temperature, long winters and warm summers with low relative humidity. Average annual precipitation varies across the sub-area from 18 inches in the northeast portion to less than 8 inches in the southern portion.

2.2 SENSITIVE AREAS

During the development of this SACP, sub-area committee discussions focused on the identification of sensitive environments and critical infrastructure that would require protection if threatened by an oil spill. The sub-area includes Dinosaur National Monument, Browns Park National Wildlife Refuge, Seedskadee National Wildlife Refuge, Ouray National Wildlife Refuge, Uintah and Ouray Indian Reservation, Ashley National Forest, and Flaming Gorge National Recreation Area. Given the semi-arid environment within the sub-area, the river system is an especially valuable resource. The river system provides water for domestic and irrigation purposes; provides critical habitat for threatened and endangered species; contains cultural and historically significant areas; and is economically important based on the recreational opportunities it offers.

The Green River Basin, in particular the rivers and riparian corridors, is of ecological importance based on the biological diversity it maintains. Of note, the Lower Green River Basin is designated by the U.S. Fish and Wildlife Service (USFWS) as critical habitat for four species of fish: Razorback Sucker, Colorado Pikeminnow, Bonytail Chub, and Humpback Chub. The four endangered fish are endemic to the Green River Basin (and larger Colorado River Basin) and are listed as endangered under the Endangered Species Act of 1973. The fish are threatened due to the cumulative effects of environmental impacts that have resulted in habitat loss (including alterations to natural flows and changes to temperatures and sediment regimes), proliferation of non-native fish, and other man-induced disturbances. In 1988, The Upper Colorado River Endangered Fish Recovery Program was established to help bring the four species of fish back from the brink of extinction.

US Fish and Wildlife and Utah Fish and Game field biologists provided the following seasonal protection strategies to protect the four species of fish during an oil spill. Appendix D contains additional information on the four species provided by the field biologists.

Spring/High Flow - Late April to Early June: The oil spill protection strategy would be to protect flood plains, wetlands, mouths of flooded tributaries, and secondary channels. This would protect the

Razorback Sucker as it spawns and larvae move into the wetland habitats for protection and to grow. This would involve implementing booming strategies to divert and/or exclude oil from entering these types of habitats. As flows decrease the floodplains and wetlands become disconnected from the main river channel and therefore mostly protected from spill impacts.

Base Flow - Late June to November: The oil spill protection strategy would be to protect backwaters and gravel spawning sites from potential exposure. This would protect the Colorado Pikeminnow (and larvae) following spawning. The plan would involve implementing booming strategies to divert and/or exclude oil from entering these types of habitats. As compared to wetlands and floodplains, the backwaters are part of the main river channels and therefore never become disconnected.

Threatened and Endangered Species: In addition to the endangered fish discussed above, Appendix C includes information about Federal and State threatened and endangered birds, reptiles, mammals, and plants that may be present in riparian corridors within the area plan. A full list of federal and state threatened and endangered species is included in the RCP (Annex III, Fish and Wildlife and Sensitive Environments). If threatened or endangered species or their habitat may be affected, the Federal OSC shall initiate emergency consultation with the USFWS in accordance with the Fish and Wildlife and Sensitive Environments Plan (Annex III to the Region VIII RCP) and the Endangered Species Act Memorandum of Understanding (Annex IV to the Region VIII RCP).

Cultural Resources: In general, identification of culturally sensitive sites in the vicinity of a spill can be accomplished by contacting the state historic preservation officer (SHPO). This individual is generally associated with the state historical preservation office or society. Additionally, response actions on tribal property should factor in the potential impacts on cultural resources. Proper consultation should be conducted to ensure the protection of all cultural sensitive resources.

If cultural, historic, or archaeological sites could be affected by response operations, the Federal OSC must consult the State Historic Preservation Officer (SHPO) and other appropriate entities as specified in the *Programmatic Agreement on Protection of Historic Properties During Emergency Response Under the NCP* (refer to Annex V of the Region 8 RCP). Additionally, response actions on tribal property should factor in the potential impacts on cultural resources. Identification of culturally, historically, or archaeologically sensitive sites in the vicinity of a spill can be accomplished by contacting the appropriate SHPO or land managing agency cultural resource specialist or other appropriate contact. This individual is generally associated with the State Historical Preservation Office or Society. Contacts for states associated with the sub-area are as follows:

Utah State Historic Preservation officer (Utah Historical Society) –
(801) 245-7225 or http://heritage.utah.gov/history/historical-society

Wyoming State Historic Preservation officer (Wyoming Historical Society) –
(307) 777-6421 or http://wyoshpo.state.wy.us/

Colorado State Historic Preservation Officer (Archaeology & Historic Preservation) –
(303) 447-8679 or http://www.historycolorado.org/

Note: The *Programmatic Agreement on Protection of Historic Properties During Emergency Response Under the NCP* applies to oil response actions pursuant to the CWA/OPA and to hazardous substance response actions pursuant to CERCLA. In accordance with the Programmatic Agreement, in 2014, Region 8 provided a public comment period for the Regional Contingency Plan. The State Historic Preservation Offices for each state as well the federal trustees were notified of this comment period and the regional approach for addressing cultural resources in the RCP and SACPs.

Advanced clearance at identified historic sites is not anticipated. However, if a land management agency, SHPO, tribal or other entity with knowledge of historic sites identifies cultural resources in the vicinity of a pre-established oil spill control point, evaluation of impacts to the cultural resource will be coordinated through the appropriate parties. Proper consultation with these and other appropriate entities should occur to ensure protection of all culturally sensitive resources. Otherwise, it is anticipated agencies with cultural resources responsibilities will be relied upon to identify and coordinate cultural resources during a response action with the lead response agency.

Additionally, EPA Region 8 has developed an interactive web-based tool (see Section 4.5 of this SACP for details concerning The Emergency Response Application [TERA]) that will identify some sensitive and/or critical features within the sub-area. The information may include, but is not limited to, critical habitat, threatened and endangered species, public use areas, cultural and historic areas, managed and protected areas, resources extraction areas, water supplies and water intakes.

3.0 OIL THREATS

This section discusses oil-related sources that pose a spill threat within the sub-area. Those threats include: (1) EPA-regulated storage facilities (those exceeding one million gallons in storage capacity) and DOT-regulated transport pipelines (six inches in diameter or greater), (2) other facilities including oil production wells and associated tank batteries, and (3) truck and rail transport activities. Regarding oil production wells, it should be noted that oil well technology advancements employing horizontal drilling and hydraulic fracturing have resulted in basins with significant well production rates. An uncontrolled discharge from a production site could pose a significant threat if occurring near water, but as previously discussed, the planning process for the SACPs places specific emphasis on large-scale discharges. The results of this planning process will also enhance capability to respond to smaller incidents.

3.1 EPA-REGULATED FRP (FIXED) FACILITY HAZARDS

EPA-regulated FRP facilities could cause substantial harm to the environment. These facilities within the sub-area have oil storage capacities exceeding 1,000,000 gallons. Each of these facilities is required to develop an approved FRP that documents, by contracts or other approved means, the resources capable of addressing a worst-case discharge at that facility. EPA Region 8 maintains current copies of all FRPs. FRP facilities within Region 8 are identified on the TERA Viewer under the “Facilities” layer. In addition, FRP facilities within the Green River Basin are shown in Figure 3.

3.2 TRANSPORTATION HAZARDS

Transportation threats include potential discharges from pipelines and along truck and rail transportation routes. Currently, the sub-area includes more than 2,000 miles of DOT-regulated pipelines (Figure 3). Additionally, thousands of miles of smaller diameter, non-regulated pipelines and oil field gathering lines are present within the sub-area. Small-diameter pipelines are not evaluated as worst-case threats. DOT-regulated pipelines within Region 8 are identified on the TERA Viewer under the “Energy” layer.

Truck and rail transportation of oil is another threat. Truck transport of oil is of concern because so much occurs within the sub-area, particularly within the Lower Green River Basin. Trucks transport oil from the Uintah Basin to Salt Lake City, Utah for refining. Oil may also be transported along rail lines in south-western Wyoming. Currently, approximately 200 miles of rail lines are present within the sub-area. Railroads within Region 8 are identified on the TERA Viewer under the “Infrastructure” layer.


FIGURE 3
EPA-REGULATED OIL STORAGE FACILITIES AND DOT-REGULATED PIPELINES
EPA REGION 8
TERA 2015
Green River
Fontenelle Reservoir
Seedskadee National Wildlife Refuge
Flaming Gorge Reservoir
Green River
Little Snake River
Dinosaur National Monument
Ouray National Wildlife Refuge
Yampa River
White River
Duchesne River
Green River
Price River
Legend
Storage Facilities >1 million gallons
Crude Oil Pipelines
Natural Gas Liquids Pipelines
Product Pipelines

3.3 OIL PRODUCTION FACILITIES

Oil and gas production wells throughout the sub-area pose a threat of release, although such facilities were not evaluated as worst-case threats based on their limited storage capacities. Over 40,000 oil and gas wells exist within the Green River Basin including the Uintah Basin in Utah; the Moxa Arch, Pinedale Anticline, Jonah, LaBarge and Continental-Divide fields in Wyoming; and the Piceance Basin in Colorado (Figure 4). Active energy wells (including oil and gas wells) within Region 8 are identified on the TERA Viewer under the "Energy" layer.

3.4 WORST-CASE DISCHARGES AND PROJECTIONS

As part of the planning process, worst-case discharge threats were identified from facilities that could cause substantial harm to the environment by discharging oil into or on the navigable waters and adjoining shorelines. To illustrate downstream extents of spills within the sub-area, oil spill projections were developed for eight FRP facilities and 11 pipeline crossings over water bodies. Spill response planning was conducted for these worst-case discharge threats. The planning process completed in preparation for a worst-case discharge from these facilities included, but was not limited to, identification/prioritization of key sensitive areas, identification of response equipment, and development of pre-planned response strategies.

3.4.1 FRP Spill Projections

EPA-regulated FRPs are required to calculate planning distances (spill projections) per regulation 40 CFR Part 112 Appendix C. The planning distance represents the estimated distance a discharged material would travel within the first 27 hours following a discharge. Planning distance calculations are required to account for adverse weather conditions.

Development of spill planning distances is not required for DOT-regulated pipelines per 40 CFR Part 194. Pipeline spill projections for this plan were developed by first identifying priority locations where pipeline spills could impact significant water bodies. These locations were primarily pipeline crossings over major rivers and primary tributaries. Within the sub-area, projections were created for pipeline crossings over water bodies considered stream order six or larger, as classified by the United States Geological Survey (USGS).

By use of the USGS National Hydrography Dataset (NHD) and the NHDPlus dataset, flow direction was determined within a watershed from a potential spill point. The NHDPlus dataset was utilized to provide mean velocity data for water bodies throughout the sub-area, and oil spill projections were developed

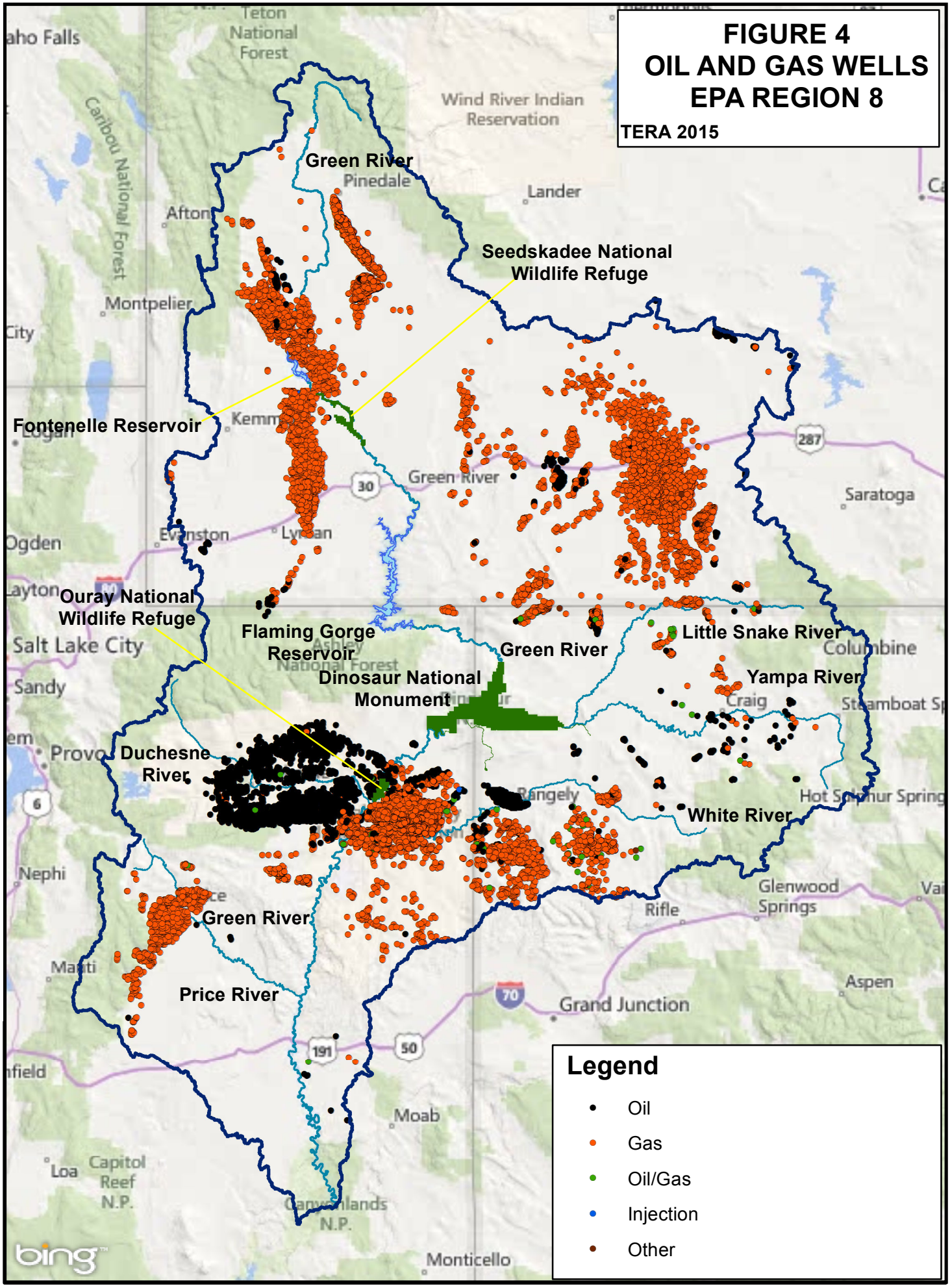


FIGURE 4
OIL AND GAS WELLS
EPA REGION 8
TERA 2015
Green River
Seedskadee National Wildlife Refuge
Fontenelle Reservoir
Ouray National Wildlife Refuge
Flaming Gorge Reservoir
Dinosaur National Monument
Green River
Little Snake River
Yampa River
White River
Duchesne River
Green River
Price River
Legend
Oil
Gas
Oil/Gas
Injection
Other

following a stream channel segment-by-segment approach. Stream segments have been established by USGS. Velocity data for each segment were used to plot the 27-hour projection. The velocity data are based on annual mean values that have been compiled over an approximate 30 year period; therefore, the projections are for average velocity conditions but do account for variable conditions, including periods of flooding and droughts.

3.4.2 FRP Worst-Case Discharges

Storage Facilities

For single-tank facilities, the worst-case discharge planning volume equals the capacity of the oil storage tank. For multiple-tank facilities, the worst-case discharge is based on the capacity of the largest oil storage tank within a common secondary containment area or the largest single oil storage tank within a secondary containment area, whichever is greater. For tanks with common piping operated as one unit, the worst-case discharge is based on the combined volume of all the tanks manifolded together.

Pipelines

DOT-regulated pipelines are required to determine the worst-case discharge for each of their response zones per 40 CFR Section 194.105. The worst-case discharge is calculated as the largest volume of one of the following:

- The pipeline's maximum release time in hours, plus the maximum shutdown response time in hours (based on historical data or operator's best estimate) multiplied by maximum flow rate, plus the largest line drainage volume after shutdown of the line section(s) in the response zone;

Or

- The largest foreseeable discharge for the line section based on the maximum historical discharge, if one exists, adjusted for any subsequent corrective or preventive action taken;

Or

- If the response zone contains one or more breakout tanks, the capacity of the single largest tank or battery of tanks within a single secondary containment system, adjusted for the capacity or size of the secondary containment system.

The maximum flow rate in a pipeline is based on the specific oil density and pipeline operating pressures. The operating range of pipeline velocities varies from three to 15 feet per second, with most operators likely running between six and 12 feet per second. The range of worst-case discharges using the calculation procedure listed above can vary significantly, depending on the operating velocities,

assumptions of release time, maximum shutdown time, and length of largest line. For a conservative estimate, the following worst-case discharges listed in the table below assume a release time of 0 minutes, a maximum shutdown time of 15 minutes, a lower end velocity of six feet per second, and a line section of 10 miles:

Pipe Size (inches)	**6**	**8**	**10**	**12**	**16**	**30**	**36**
Worst-Case Discharge (barrels [bbl])	2,000	3,600	5,600	8,100	14,400	50,800	73,000

4.0 RESPONSE OPERATIONS AND ROLES

This section describes response roles, notification procedures, control point and response strategies, equipment and resources, and the EPA-managed web-based tool TERA.

4.1 GENERAL PATTERN OF RESPONSE (OPERATIONS)

Subpart D of the NCP outlines the general pattern of response and expected response operations. This is defined in detail at 40 CFR Sections 300.300 through 300.315, and generally includes the following:

Phase I—Discovery or Notification

A discovery and reporting of a spill or discharge of oil may be communicated to the appropriate agencies through various sources including members of the public, governmental agencies, private companies, etc. Reporting requirements differ among counties and states. Critical aspects of reporting are timeliness and accuracy of information provided. Specific federal reporting requirements apply to the facilities from which a discharge of oil threatens waters, and the federal reporting requirements are not met by reporting to the state or local agencies. Federal reporting requirements are specified below:

"Any person in charge of a vessel or a facility shall, as soon as he or she has knowledge of any discharge from such vessel or facility in violation of Section 311(b)(3) of the CWA, immediately notify the NRC [National Response Center]. If direct reporting to the NRC is not practicable, reports may be made to the USCG [US Coast Guard] or EPA pre-designated OSC [On-Scene Coordinator] for the geographic area where the discharge occurs. **The EPA pre-designated OSC may also be contacted through the Regional 24-hour emergency response telephone number.** All such reports shall be promptly relayed to the NRC. In any event such person in charge of the vessel or facility shall notify the NRC as soon as possible." (40 CFR Section 300-300(b)).

The NRC is the national communications center for oil and hazardous substance spill reporting. The NRC acts as the single point of contact, at the federal level, for all incident reporting. Notice of an oil discharge or release of a hazardous substance in an amount equal to or greater than the reportable quantity must occur immediately in accordance with the CWA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) under 33 CFR Part 153, Subpart B, and 40 CFR Part 302, respectively. All notices of discharges or releases received at the NRC are relayed by telephone to the Region 8 Regional Response Center. The OSC receiving these notifications will ensure notification to the appropriate federal, state, or tribal agency affected by or reasonably expected to be affected by the

discharge or release. The NRC spill reports are also sent directly to the RRT agencies, including the states, and certain other agencies.

To notify the NRC Duty Officer, call (800) 424-8802.

To notify the Region 8 Regional Response Center, call (303) 293-1788.

The Department of Interior (DOI) Regional Environmental Officer, Office of Policy and Compliance (303-445-2500), should be notified and kept advised of any spills or releases on or potentially affecting DOI-administered lands or resources. The United States Department of Agriculture (USDA) should be kept advised of any spills or releases on USDA-administered lands. Additional notification protocols are further defined in the Region 8 RCP.

Appendix A of this SACP includes a list of Sub-Area Committee members, sub-area stakeholders, and industry contacts. The sub-area contact list is also available on TERA (discussed further in Section 4.5 of this SACP), on the Tool Bar in the "Documents" folder. The contact list available on TERA will be revised periodically as contact information changes. TERA Viewer is available at the following website: https://r8.ercloud.org/TERA_External/

Phase II—Preliminary Assessment and Initiation of Action

Following a report to the NRC and/or the EPA that an oil discharge has occurred which threatens surface water, a Federal OSC will initiate efforts to determine potential impacts from the oil and whether response actions are under way. The purpose of the assessment is to determine the magnitude and potential threats to the public using available information such as existing mapping tools, contacting the reporting party, contacting state and/or local officials on scene, and possibly deploying EPA personnel and contractors to directly assess conditions.

If a response action is under way or deemed necessary, the Federal OSC will assess whether to rely on personnel on scene or if a response by the EPA is necessary. Generally, any major discharge of oil that threatens waters (10,000 gallons or more to inland zone waters) will result in deployment of a Federal OSC from the Regional office to ensure implementation of an adequate response action. The standard incident management approach during a significant incident includes a Unified Command organization with appropriate agency and industry representatives. The following section from the NCP describes generally the protocol for evaluating a response and determining the level of federal involvement:

"Except in a case when the OSC is required to direct the response to a discharge that may pose a substantial threat to the public health or welfare of the United States (including but not limited to fish, shellfish, wildlife, other natural resources, and the public and private beaches and shorelines of the United States), the OSC may allow the responsible party to voluntarily and promptly perform removal actions, provided the OSC determines such actions will ensure an effective and immediate removal of the discharge or mitigation or prevention of a substantial threat of a discharge. If the responsible party does conduct the removal, the OSC shall ensure adequate surveillance over whatever actions are initiated. If effective actions are not being taken to eliminate the threat, or if removal is not being properly done, the OSC should, to the extent practicable under the circumstances, so advise the responsible party. If the responsible party does not respond properly the OSC shall take appropriate response actions and should notify the responsible party of the potential liability for federal response costs incurred by the OSC pursuant to the OPA and CWA. Where practicable, continuing efforts should be made to encourage response by responsible parties." (40 CFR Section 300.305(d))

In addition, the Federal OSC shall ensure that the natural resource trustees are promptly notified. The Federal OSC will coordinate with affected trustees regarding assessment, evaluations, investigations, and planning of appropriate removal actions as per 40 CFR Section 300.305(e).

Phase III—Containment, Countermeasures, Cleanup, and Disposal

The appropriate actions to implement to reduce impacts of an oil spill will vary significantly, depending on the physical environment, water flow conditions, access to the area, and potential threats to public safety and the environment. The NCP outlines basic guidelines for responding that include:

"(a) Defensive actions shall begin as soon as possible to prevent, minimize, or mitigate threat(s) to the public health or welfare of the United States or the environment. Actions may include but are not limited to: analyzing water samples to determine the source and spread of the oil; controlling the source of discharge; measuring and sampling; source and spread control or salvage operations; placement of physical barriers to deter the spread of the oil and to protect natural resources and sensitive ecosystems; control of the water discharged from upstream impoundment;….." (40 CFR Section 300.310(a))

"(b) As appropriate, actions shall be taken to recover the oil or mitigate its effects. Of the numerous chemical or physical methods that may be used, the chosen methods shall be the most consistent with protecting public health and welfare and the environment. Sinking agents shall not be used." (40 CFR Section 300.310 (b)).

Additional standards apply to use of chemical countermeasures such as dispersants, and these are addressed in the NCP and the RCP, and as discussed below in Section 5. In short, chemical agents may be used only if approved by the Federal OSC after consultation with and approval by the RRT.

Oil and contaminated materials recovered in cleanup operations shall be disposed of in accordance with applicable laws, regulations, or requirements. Any localized disposal requirements identified by Sub-Area Committees will be described in those SACPs. Disposal assistance may be obtained through the EPA RCRA National Hotline at 1-800-424-9346, the EPA Region 8 Hotline at 1-800-227-8917, or http://www2.epa.gov/region8/contact-region-8.

Additional authorities are available to the Federal OSC during response actions conducted under the NCP that address CWA regulations. For example, the Federal OSC has the authority to direct a discharge to water without a permit as specified in 40 CFR Section 122.3(d), and actions subject to CWA 404 permit requirements are authorized under Nationwide Permit 20.

Phase IV—Documentation and Cost Recovery

Agencies undertaking response actions funded by the Oil Spill Liability Trust Fund (OSLTF) must comply with reporting and documentation requirements to receive reimbursement and to allow for cost recovery from responsible parties. In addition, the information must be obtained during a response to an oil spill to accurately record the impacts, and that information must be available to trustees to assist in evaluating potential injuries to natural resources. For more information regarding the OSTLF, please refer to Sections 300.315 and 300.335 of the NCP.

4.2 RESPONSE ROLES

The NCP and the National Response System it created address response roles of many federal, state, local, and tribal organizations. More information about the National Response System is in Sections 300.100 through 300.185 of the NCP. The general assumption is that local and state authorities will be the first responders at the scene of an oil discharge, with federal resources to follow as needed. Some incidents may impact multiple jurisdictions. The NCP relays the expectation that responding entities will coordinate their efforts and, to the extent practicable, respond in a manner that considers each jurisdiction's priorities and concerns. This should be accomplished through a National Incident Management System Unified Command structure or some other appropriate means.

If an oil spill poses a threat to the public, the NCP describes in significant detail the role of lead agencies and other federal agencies during both planning activities and response actions. As a matter of general

practice and as conceived in the NCP, the intent is for the Responsible Party (RP) to conduct response actions. Also, the state and local agencies with such authority are part of the National Response System and will likely oversee most response actions. The federal government may respond to an incident in various ways depending on the nature and magnitude of the incident. Many oil spills are handled completely at the local and/or state level. During such incidents, the Federal OSC must assess the situation in coordination with the appropriate state and local officials.

In addition to the elements described in Section 4.1 above, Section 300.317 of the NCP identifies the response priorities to a discharge of oil regardless of who conducts the response action. The National Response Priorities are listed below.

(a) Safety of human life must be given top priority during every response action.

(b) Stabilizing the situation to preclude the event from worsening is the next priority. All efforts must be focused on measures to stabilize a situation involving a facility, pipeline, or other source of pollution. Stabilizing the situation includes securing the source of this spill and/or removing the remaining oil from the container (vessel, tank, or pipeline) to prevent additional oil spillage, to reduce the need for follow-up response actions, and to minimize adverse impact to the environment.

(c) The response must use all necessary containment and removal tactics in a coordinated manner to ensure a timely, effective response that minimizes adverse impact to the environment.

(d) All parts of this national response strategy should be addressed concurrently, but safety and stabilization are the highest priorities. The OSC should not delay containment and removal decisions unnecessarily and should take actions to minimize adverse impact to the environment that begins as soon as a discharge occurs, as well as actions to minimize further adverse environmental impact from additional discharges.

(e) The priorities set forth in this section are broad in nature, and should not be interpreted to preclude the consideration of other priorities that may arise on a site-specific basis.

The sections that follow highlight some of the major entities involved with a typical oil spill incident and their roles/responsibilities. This is not intended to be all inclusive. An agency's or jurisdiction's involvement may vary based on site-specific conditions and concerns.

4.2.1 Responsible Party Roles/Responsibilities

The Responsible Party (RP) is the individual, agency, or company owning or operating the vessel or facility that becomes the source of a discharge of oil into navigable waters or threatens to discharge thereto. As defined in OPA, each party responsible for oil discharged, or if there is substantial threat of a discharge, into or upon the navigable waters or adjoining shorelines, is liable for the removal costs and damages specified in Section 311(f) of CWA. Section 311(c)(3)(b) of CWA requires a facility owner or

operator participating in removal efforts to act in accordance with the NCP and the applicable response plan required under Section 311(j).

Any person in charge of a vessel or facility (as defined in Section 300.5 of the NCP) shall, as soon as he or she has knowledge of any discharge from such vessel or facility in violation of Section 311(b)(3) of the CWA, immediately notify the NRC, as described in the Emergency Notifications section above.

The RP shall immediately provide the Federal OSC and relevant authorities with information about the discharge and assist the Federal OSC with the preliminary assessment, including determining the magnitude and severity of the discharge and the threat to public health or welfare of the United States or the environment. As soon as practicable, the RP should assess the feasibility of removal and initiate response actions. Once established, the RP is expected to operate within a Unified Command with federal, state, and local authorities to achieve an effective and efficient response.

Permission to access private property to conduct the response action must be obtained from the property owner. The RP is expected to secure such access before or during response actions. Furthermore, restoration of private property damaged during the response is considered appropriate as part of the removal action.

If the RP is unknown, fails to respond, or responds in a manner considered inadequate, the local, state, or federal agency having jurisdiction must exercise its authority to assume control of the response effort. The RP shall provide all reasonable cooperation and assistance requested by the Federal OSC, consistent with the CWA (CWA Section 311(c)(3)(B)). Following termination of the emergency response, the RP is required by law to take steps to prevent recurrence of spills or releases. Corrective actions may include improved planning, increased inspections, or implementation of physical preventive measures.

4.2.2 Federal OSC Roles/Responsibilities

The CWA and OPA 90 direct the President to respond to, oversee, and ensure adequate removal of discharges of oil to waters of the United States. This authority and responsibility has been delegated to the Federal OSC. The primary duties of the OSC have been described in the above sections of this document. In summary, the Federal OSC, once notified of a discharge of oil that has entered or that threatens waters of the United States, must perform a preliminary assessment of the spill and ensure notification to the natural resource trustees. If a response is required to mitigate the threat from the oil, the Federal OSC must evaluate adequacy of the response by private, state, or local authorities. Not all

spills warrant that a Federal OSC perform on site oversight, and in many cases, the state and local agencies will assume that responsibility to monitor RP cleanup activities.

However, if the Federal OSC determines that EPA involvement is required, based on information available from the scene, the Federal OSC will request funding as needed from the National Pollution Fund Center to conduct a response. The Federal OSC will encourage and may allow the RP to voluntarily and promptly perform removal actions, provided the Federal OSC determines such actions will ensure an effective and immediate removal of the discharge or mitigation or prevention of a substantial threat of a discharge. When the RP does conduct the removal, the Federal OSC shall ensure adequate surveillance over whatever actions are initiated. If effective actions are not being taken to eliminate the threat, or if removal activity is not adequate, the Federal OSC should, to the extent practicable under the circumstances, so advise the RP. (40 CFR Section 300.305(d)).

If the RP does not respond adequately, the Federal OSC shall take appropriate response actions and should notify the RP of the potential liability for federal response costs incurred by the Federal OSC pursuant to the OPA and CWA. The Federal OSC has the responsibility and authority to respond and commit federal resources to implement the actions necessary to respond to a discharge of oil. Because no coastal zones are present within Region 8, EPA is the agency that will provide the Federal OSC for oil discharges in accordance with the CWA and OPA 90.

In carrying out a response under this section, the Federal OSC may:

- Remove or arrange for removal of a discharge, and mitigate or prevent a substantial threat of a discharge, at any time;
- Direct or monitor all federal, state, and private actions to remove a discharge; and
- Remove and, if necessary, destroy a vessel discharging, or threatening to discharge, by whatever means are available. (40 CFR Section 300.305 (d)(1)).

If the oil discharge results in a substantial threat to the public health or welfare of the United States (including, but not limited to fish, shellfish, wildlife, other natural resources, and the public and private beaches and shorelines of the United States), the Federal OSC must direct all response efforts, as provided in Section 300.322(b) of the NCP. The Federal OSC should declare as expeditiously as practicable to spill response participants that the federal government will direct the response. The Federal OSC may act without regard to any other provision of the law governing contracting procedures or employment of personnel by the federal government in removing or arranging for removal of such a discharge (refer to Subpart D of the NCP).

The Federal OSC shall ensure that the natural resource trustees are promptly notified, to the maximum extent practicable as provided in the Fish and Wildlife and Sensitive Environments Plan Annex to the RCP for the area in which the discharge occurs. The Federal OSC and the trustees shall coordinate assessments, evaluations, investigations, and planning with respect to appropriate removal actions. The Federal OSC shall consult with the affected trustees and natural and cultural resource managers on the appropriate removal action to be taken. This is required by Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act. National memoranda of understanding were developed to define how these consultations shall be performed during oil and hazardous substance emergencies. These memoranda are included as annexes to the RCP.

Natural resource damage assessment activities by the trustee agencies are separate from removal activities but should be coordinated to ensure greatest efficiency and protection. When circumstances permit, the Federal OSC shall share use of non-monetary response resources (i.e., personnel and equipment) with the trustees, provided trustee activities do not interfere with response actions. The lead administrative trustee facilitates effective and efficient communication between the Federal OSC and the other trustees during response operations and is responsible for applying to the Federal OSC for non-monetary federal response resources on behalf of all trustees. The lead administrative trustee is also responsible for applying to the National Pollution Funds Center to initiate funding for damage assessment pertaining to injuries to natural resources.

4.2.3 Federal Agency Roles/Responsibilities

The federal government may respond to an oil discharge in various ways depending on the nature and magnitude of the incident. Federal agencies have defined roles established in the NCP, and those agencies have responsibilities under delegated authorities. They may also have resources needed to assist during a response. If assistance is required, it will be coordinated through an incident-specific RRT (refer to Section 300.115 of the Region 8 RCP for further details concerning Incident-Specific RRTs). Federal agencies are expected to make facilities and resources available to the Federal OSC consistent with agency capabilities and authorities, as called for in the NCP (NCP Sections 300.170 and 175).

In any case, where a natural resource is injured or threatened, the natural resource trustees and natural and cultural resource managers (both federal and state) will provide additional assistance and provide advice regarding response priorities. These entities will provide timely advice concerning recommended actions regarding natural and cultural resources potentially affected. The natural resource trustees also will assure that the Federal OSC is informed of their activities in natural resource damage assessment that may

affect response operations. The trustees shall assure, through the lead administrative trustee, that all data from the natural resource damage assessment activities which may support more effective operational decisions are provided in a timely manner to the Federal OSC.

In the event of a worst-case discharge of oil, as described herein, the Federal OSC will respond and coordinate the response activities with local and state responders and the RP within a Unified Command system.

Generally, many federal agencies may have significant roles to fulfill during a response action. Departments and agencies having land management, cultural resource, and wildlife management duties may have resource concerns that must be factored into the response operations. It is the responsibility of the Federal OSC to coordinate with the appropriate trustees in the event a discharge of oil or hazardous substance release that impacts those resources.

Other federal agencies involved with the National Response System, such as the Department of Health and Human Services, Department of Energy, and the Federal Emergency Management Agency (FEMA), may be called upon to assist in accordance with their usual statutory roles.

4.2.4 State Government Roles/Responsibilities

The roles of the respective state agencies during an oil discharge are generally well established, and coordination with the EPA through the RRT occurs on regular basis. Each state is encouraged to actively participate in National Response System activities, and each Governor has designated lead state agencies for certain activities. These designations can be found in the RCP. These designees and other state entities are critical to oil spill response because of their authorities governing water quality, management of state lands, and other items.

The state RRT representative is responsible for ensuring the following actions are completed, as appropriate: notify downstream water users (municipal, industrial, and agricultural) of all discharges and releases that may pose a threat to the water supply; notify and coordinate with other state and local agencies, including other state natural resource trustees, as appropriate; take responsibility, in conjunction with the Federal OSC, for selection of disposal sites, arrangements for use of disposal sites, and selection of transportation routes to disposal sites; make arrangements with the State Emergency Response Commission to provide security for all on-scene forces and equipment; assist the EPA with the determination of the degree of hazard of the discharge; and operate a site, if necessary and when no RP or principal RP has been identified.

For incidents not subject to the National Response System organization (i.e., because these are not regulated by CERCLA or CWA), states are encouraged to undertake response actions themselves or to use their authorities to compel potential RP(s) to undertake response actions.

State Emergency Management Agencies

State Emergency Management Agencies are often heavily involved in maintaining situational awareness of local incidents occurring within each state. They are also responsible for coordinating with, resourcing, and mobilizing elements and agencies in the rest of state government for incident response and local support, as needed. Spill notifications and distribution of this information to other federal, state, and local agencies is critical to initiating response actions under this SACP.

State Environmental Regulatory Agencies

State environmental regulatory agencies typically have a role in overseeing response to oil and hazardous materials incidents, and often provide a representative to the Region 8 RRT. Generally, states have primary authority for enforcing standards related to water quality and permitting. In these capacities, the states play a key role in notification, monitoring, and approval of certain actions during an oil removal action. For example, if an in-situ burn is determined appropriate, a state emergency air permit may be required prior to commencing that burn. Also, if drinking water supplies are impacted, the state has a role in evaluating those impacted facilities and water supplies, if necessary.

State Resource Trustee Agencies

State resource trustees are typically technical resources for the Unified Command. State wildlife management agencies often serve as subject matter experts on local river access, wildlife habitat and behavior, and sensitive ecological resources. State land management agencies may be able to provide technical support and resources, including personnel and equipment to assist where appropriate. Consultation with state resource trustees is necessary to ensure proper measures are implemented to limit the effects of the response actions on natural resources and recreation facilities. For example, proper decontamination is necessary to prevent spread of aquatic invasive species into a state or their migration to multiple areas within a state. Support from the appropriate state agency to inspect response contractor equipment may be necessary during a large incident.

4.2.5 Tribal Government Roles/Responsibilities

The NCP also defines roles and responsibilities of tribal governments. Tribes act as trustees for the natural resources, including their supporting ecosystems, belonging to, managed by, controlled by, or appertaining to such Indian tribe, or held in trust for the benefit of such Indian tribe, or belonging to a member of such Indian tribe, if such resources are subject to a trust restriction on alienation. Designated tribal officials are assigned to act when there is injury to, destruction of, loss of, or threat to natural resources, including their supporting ecosystems.

In addition, tribal emergency management and environmental agencies have responsibilities similar to those described above for state agencies. Water and air quality program standards within reservations must be factored in during response actions. Representatives from these agencies should be consulted during response activities.

4.2.6 Local Jurisdictions/Agencies Roles/Responsibilities

Local Fire Departments, Law Enforcement, and Emergency Medical Services

Public safety organizations will generally be the first government representatives at the scene of a discharge or release. They are expected to initiate public safety measures necessary to protect public health and welfare and that are consistent with containment and cleanup requirements in the NCP. They are responsible for directing evacuations pursuant to existing state or local procedures. Local agencies may provide the initial incident command and establish a command post. The local agency may also establish a Unified Command with other government agencies, depending upon the extent of the incident. They will likely isolate the scene and restrict access, conduct appropriate initial notifications, and perform any other necessary life-safety functions including search and rescue, firefighting, or other defensive actions, emergency medical care, and decontamination of exposed persons. They may also provide emergency communications equipment, on-scene liaison with Unified Command, public information support to Unified Command, and protective action guidance to stakeholders.

Local Emergency Planning Committee (LEPC) and County Emergency Management

As specified in Sections 301 and 303 of the Superfund Amendments and Reauthorization Act (SARA) Title III, local emergency planning districts are designated by the State Emergency Response Commission (SERC) in order to facilitate preparation and implementation of emergency plans. Each LEPC is to prepare a local emergency response plan for the emergency planning district and establish procedures for receiving and processing requests from the public for information generated by SARA Title III reporting

requirements. The LEPC is to appoint a chair and establish rules for the LEPC. The LEPC is to designate an official to serve as coordinator for information, and designate in its plan a community emergency coordinator. In addition to meeting the requirements for local emergency plans under SARA Section 303, state and local government agencies are encouraged to include contingency planning in all emergency and disaster planning for responses, consistent with the NCP, RCP, and ACP.

Local Hazardous Material (HAZMAT) Response Teams

Local HAZMAT response teams perform specialized mitigation and response actions at incidents involving hazardous materials and petroleum. These resources are often a sub-set of the local fire departments in the largest cities and towns throughout each state. Generally, dispatch of local HAZMAT response teams outside of their local jurisdictions in support of neighboring communities within their designated regions must occur via the state emergency management agencies. Local HAZMAT teams may implement defensive measures in the initial response, and these agencies are critical to ensure public safety. However, most local HAZMAT teams are not equipped to perform oil containment and recovery on water.

4.3 RESPONSE STRATEGIES AND CONTROL POINTS

A key component of this sub-area oil spill response planning effort is development of pre-planned response strategies. Field reconnaissance activities were conducted to identify accessible control points along the rivers and large water bodies within the sub-area where response strategies could be implemented relatively quickly. Control points and response strategies were developed in relation to worst-case discharge spill projections and the general protection approach defined in Section 3.0 of this SACP. Control Points are identified on the TERA Viewer within the “Geographic Response Plans” layer. This layer also contains boat ramps, staging areas, booming strategies, and other response-related information. In addition, examples of the TERA map with control points and the corresponding response strategies are shown in Figures 5 and 6.

These control points were determined to be the best locations identified to contain/collect oil with the goal of protecting sensitive resources. Assumedly, these control points will be used during the initial 24 to 72-hour response period, when response equipment and resources are often limited.

Relative ease of access to the pre-identified control points was considered during the response planning. The majority of the control points are on public lands, so legal access (i.e., permission to enter the property) is expected to be granted. However, several control points are on, or require passing through,

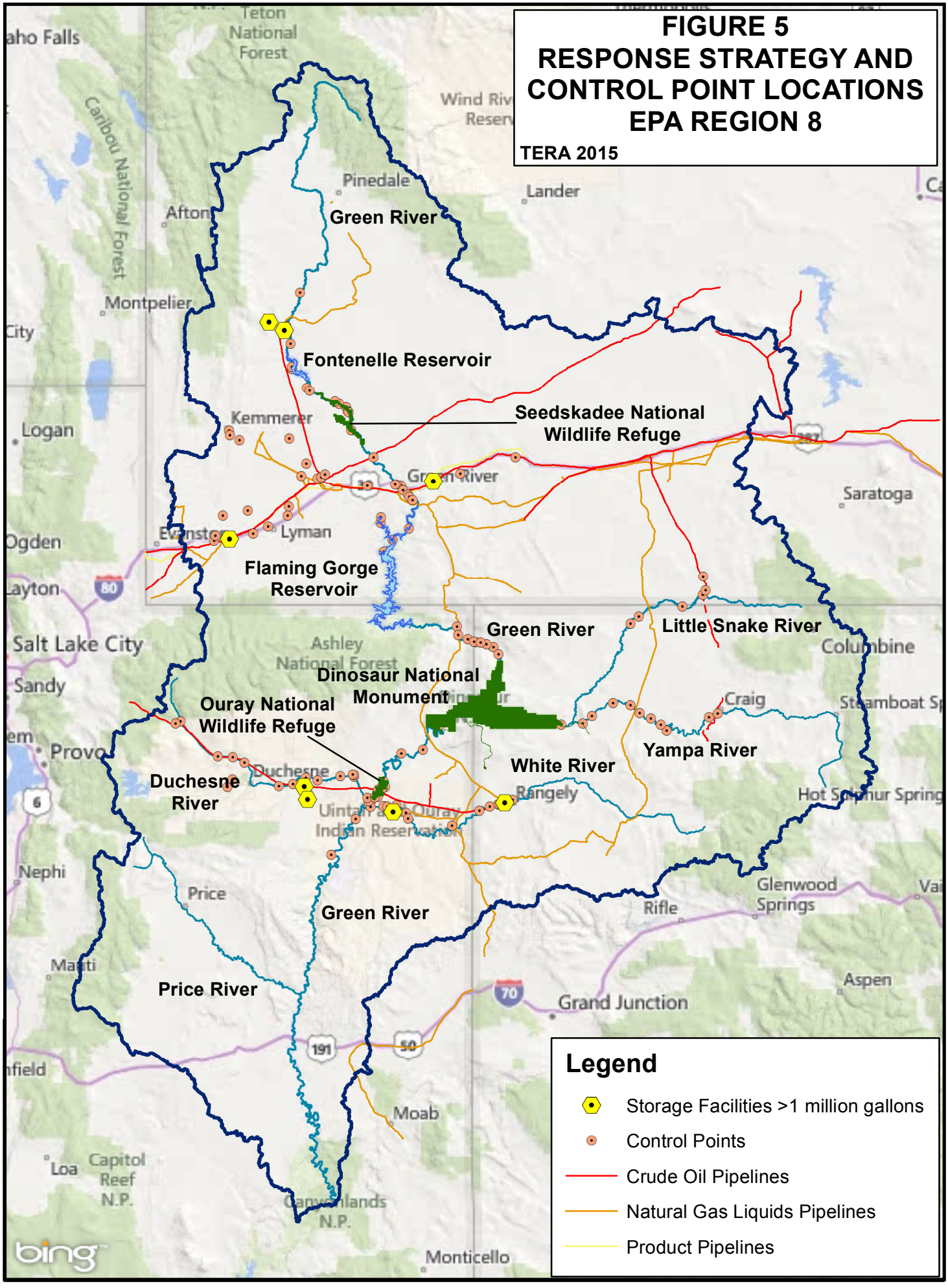
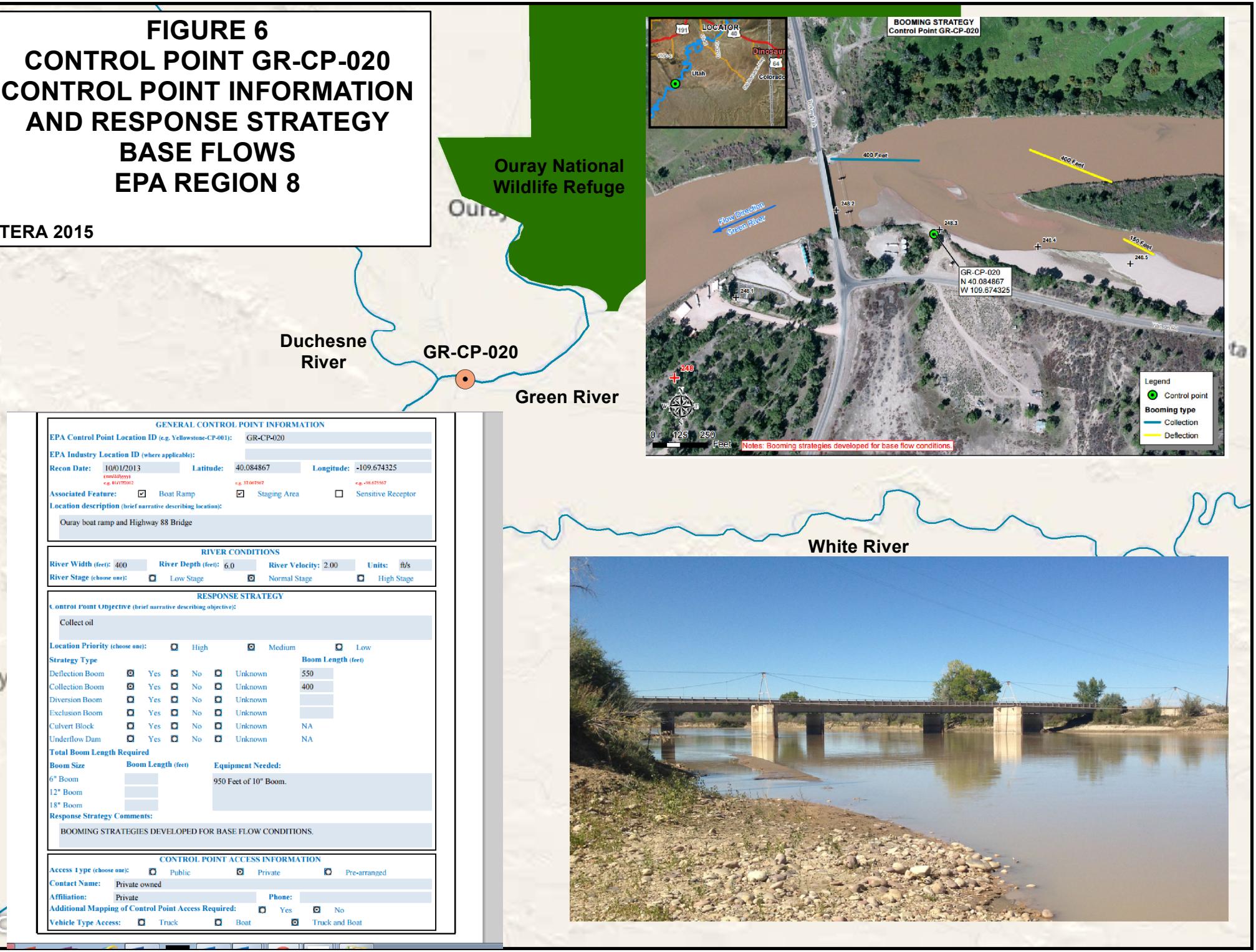


FIGURE 5
RESPONSE STRATEGY AND CONTROL POINT LOCATIONS
EPA REGION 8
TERA 2015
Green River
Fontenelle Reservoir
Seedskadee National Wildlife Refuge
Flaming Gorge Reservoir
Green River
Little Snake River
Dinosaur National Monument
Ouray National Wildlife Refuge
Duchesne River
White River
Yampa River
Green River
Price River
Legend
Storage Facilities >1 million gallons
Control Points
Crude Oil Pipelines
Natural Gas Liquids Pipelines
Product Pipelines

FIGURE 6
CONTROL POINT GR-CP-020
CONTROL POINT INFORMATION AND RESPONSE STRATEGY
BASE FLOWS
EPA REGION 8

TERA 2015



GENERAL CONTROL POINT INFORMATION

EPA Control Point Location ID (e.g. Yellowstone-CP-001):	GR-CP-020
EPA Industry Location ID (where applicable):	
Recon Date: (mm/dd/yyyy) e.g. 01/17/2012	10/01/2013
Latitude: e.g. 37.067567	40.084867
Longitude: e.g. -98.675567	-109.674325

Associated Feature: ☑ Boat Ramp ☑ Staging Area ☐ Sensitive Receptor

Location description (brief narrative describing location):

Ouray boat ramp and Highway 88 Bridge

RIVER CONDITIONS

River Width (feet):	400	River Depth (feet):	6.0	River Velocity: 2.00	Units: ft/s

River Stage (choose one): ☐ Low Stage ☑ Normal Stage ☐ High Stage

RESPONSE STRATEGY

Control Point Objective (brief narrative describing objective):

Collect oil

Location Priority (choose one): ☐ High ☑ Medium ☐ Low

Strategy Type					Boom Length (feet)
Deflection Boom	☑ Yes	☐ No	☐ Unknown		550
Collection Boom	☑ Yes	☐ No	☐ Unknown		400
Diversion Boom	☐ Yes	☐ No	☐ Unknown		
Exclusion Boom	☐ Yes	☐ No	☐ Unknown		
Culvert Block	☐ Yes	☐ No	☐ Unknown		NA
Underflow Dam	☐ Yes	☐ No	☐ Unknown		NA

Total Boom Length Required

Boom Size	Boom Length (feet)	Equipment Needed:
6" Boom		950 Feet of 10" Boom.
12" Boom		
18" Boom		

Response Strategy Comments:

BOOMING STRATEGIES DEVELOPED FOR BASE FLOW CONDITIONS.

CONTROL POINT ACCESS INFORMATION

Access Type (choose one): ☐ Public ☑ Private ☐ Pre-arranged

Contact Name: Private owned

Affiliation: Private Phone:

Additional Mapping of Control Point Access Required: ☐ Yes ☑ No

Vehicle Type Access: ☐ Truck ☐ Boat ☐ Truck and Boat

privately-owned property. To obtain entry on privately-owned property, access agreements, verbal or written, are required. Response strategies developed as part of this SACP are not the only activities required to contain and recover oil during a response. Defensive actions must be initiated as soon as possible to prevent, minimize, or mitigate threat(s) to the public health or the environment.

Response strategies to be implemented at each control point area were developed for certain conditions (flow, weather, etc.). A response strategy is the technique likely to be implemented at a particular control point (e.g., deflection boom deployed to move oil away from sensitive receptors/habitat). However, incident-specific or site-specific conditions, movement of oil, and time necessary to mobilize response resources to a control point must be considered during an incident. Response personnel must be knowledgeable and ready to modify the response strategies as needed to mitigate the threat, given specific environmental conditions during a response.

Implementation of the response strategies requires trained personnel. Facility owners or operators must ensure that all private response personnel they employ are trained to meet the Occupational Safety and Health Administration standards for emergency response operations promulgated in 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response regulations). These regulations were established to ensure the health and safety of personnel employed in hazardous substance response and cleanup operations. Additionally, response activities could involve boat operations and handling of oil response equipment. Trained personnel who may be available to assist during a response include those affiliated with private industry, response contractors, and federal/state/local agencies.

Additionally, Appendix B of this SACP is an oil spill response document that summarizes general oil spill response techniques that are relevant to the Green River Sub-Area. Response strategies and techniques discussed in this document are not site/location-specific and are intended for broad planning use.

4.4 RESOURCES AND EQUIPMENT

As previously discussed, owners of EPA-regulated FRP facilities and DOT-regulated pipelines are required to develop plans to address a worst-case discharge from their facilities or pipelines. These plans include notification procedures, identification of resources, and provisions for specific actions. The plans also include details on installation or construction of equipment or structures so that spills can be contained as soon as possible. This usually involves secondary containment systems, such as dikes, barriers, and diversionary flow paths. In general, industry planning is designed to contain spills at the source and at the facility. Downstream planning with a focus on protection of sensitive resources is often not included.

In addition, regulated facilities/pipelines have minimum equipment requirements to address a worst-case discharge (generally 1,000 feet of boom). Facility equipment and resources are often limited and used immediately at the time of a spill at the source or the nearest downstream location. Regulated FRP facilities and pipelines have contracts with Oil Spill Removal Organizations (OSROs) to respond to spills. Mobilization time for an OSRO can be lengthy depending on the location of the spill. The initial 24 to 72 hours following a spill are the most critical for containment and planning of upcoming response operations. The control points and response strategies discussed in Section 4.3 were primarily developed to provide guidelines for potential response measures designed to reduce downstream spread of an oil spill.

Available equipment and resources may be a limiting factor within the initial hours following a spill. The intent of the SACP planning effort is to include information regarding equipment cache locations, inventories, and contacts in this plan. Equipment cache information is available within the “Geographic Response Plan” layer, in the "Documents" folder on the Tool Bar.

4.5 THE EMERGENCY RESPONSE APPLICATION (TERA)

TERA is an EPA-developed and -managed web-based tool (referred to as a Viewer). TERA contains geospatial data from federal, state, and private sources. TERA was developed to assist in planning and response. TERA also provides the initial geospatial platform for the EPA during spill responses.

TERA was used in this plan to assess reaches of navigable waters and adjoining shoreline that would be impacted by a discharge of oil from an FRP. The 27-hour FRP spill projection data layer was used in conjunction with data layers where sensitive areas are identified. These areas include: critical habitat for threatened and endangered species, national wildlife refuges and wilderness areas as identified by USFWS; national parks and monuments as designated by the National Park Service; all of the state parks in Region 8; public drinking water facilities in the 6-state area, and other such critical resources as identified by the EPA. Representatives from federal and state trustees who manage these sensitive areas were contacted to attend area committee meetings and conduct field work with the Federal OSC to establish access locations (control points) for development of response strategies (see Section 4.3).

TERA is composed of mapping components and data layers including drinking water intakes, critical habitat information, sensitive species information, protected areas, bulk oil storage facilities, pipelines, tactical response strategies, equipment caches, and river access points (control points and/or boat ramps). Each component is organized and grouped in a layer structure and includes pertinent response information. The user can access and display critical response information, such as emergency contacts

and boom deployment strategies. TERA is an important tool in the initial stages of a response and provides readily-accessible information to OSCs, trustees, and state, tribal, and local emergency responders.

TERA will be the primary method of disseminating this SACP because it allows the Sub-Area Committee to readily maintain up-to-date information. TERA is available to the Sub-Area Committee, RRT, and responding governmental agencies and industry that is subject to oil spill and hazardous substances response planning requirements; however, a username and password must be obtained through EPA Region 8. TERA Viewer is available at the following website: https://r8.ercloud.org/TERA_External/ . A TERA User Guide is available on the TERA Viewer Tool Bar in the "Documents" folder.

5.0 CHEMICAL COUNTERMEASURES, IN-SITU BURNS, BIOREMEDIATION

A number of actions are possible to address oil discharges. Normal physical recovery methods of containment, pumping, sorbing, and digging are preferred in Region 8, but chemical countermeasures, in-situ burns, and bioremediation are also options. These techniques include use of various chemicals to emulsify, solidify, gel, or herd oil on water; chemicals to promote biodegradation of oil; and combustion of spilled oil to quickly reduce the volume of oil in the environment. Section 311(j)(4)(C)(v) of the CWA, as amended by OPA 90, requires that the Area Committee "describe the procedures to be followed for obtaining an expedited decision regarding the use of dispersants." General procedures are described in the following sections, and more detail is available in Annex IX of the Region 8 RCP.

5.1 CHEMICAL COUNTERMEASURES/SUBPART J AGENTS

Region 8 provides no pre-authorizations for use of chemical countermeasures. If subject to Subpart J regulations in the NCP, chemical countermeasure use must be reviewed and authorized by the incident-specific RRT. This includes use of surface collecting agents, dispersants, biological additives, burning agents, or miscellaneous oil spill control agents. "Sinking agents" are not allowed in EPA Region 8. The Federal OSC may request RRT approval to use chemicals on behalf of the RP for the spill. However, physical recovery and removal of oil is the preferred cleanup technique.

The EPA has compiled a list of dispersants and other chemicals that the Federal OSC or the party responding to the spill may consider for use during a spill emergency—the NCP Product Schedule (available at: http://www.epa.gov/emergencies/docs/oil/ncp/schedule.pdf). Listing of a product on the NCP Product Schedule does not authorize or pre-approve use of listed products, and products not listed may not be used.

The Federal OSC may authorize use of any chemical countermeasure agent without obtaining RRT authorization if it is immediately necessary to prevent or substantially reduce hazard to human life. In this event, the Federal OSC will inform the RRT and the RRT representative of the affected state as soon as practicable. In situations not involving immediate human hazard, the Federal OSC must notify and receive concurrence of the RRT Co-Chairs (EPA Region 8 and USCG) and the RRT representative of the affected state, and where practicable, will consult with the natural resource trustees.

5.2 IN-SITU BURNS

Under certain specific conditions, in-situ burning may offer a logistically simple, rapid, inexpensive, and relatively safe means of reducing impacts of an oil spill. Burning can reduce the need for collection,

storage, transport, and disposal of recovered material. In certain circumstances, such as in remote, difficult to access areas and or where ice has contained the oil, burning may be the more effective and preferred response technique. In-situ burning may have significant short-term impacts (e.g.,airborne release of particulate matter), but may actually produce the lowest long-term impact because it removes the oil quickly. In-situ burning should augment, not replace, other oil spill response techniques such as mechanical removal or chemical countermeasures. For the Green River Sub-Area, the use of in-situ oil burning will be considered as a means to avert potential oil spill impacts.

In accordance with the NCP, RCP, and ACPs, if an accelerant is used to promote sustained burning of oil, procedures described in Section 5.0 above and Subpart J of the NCP must be followed. Specifically, the RRT must authorize use of the accelerant for the in-situ burn. If no accelerant or other chemical countermeasure is used, the RP/Unified Command must consult with the affected state(s) and natural resource trustees to obtain appropriate permits (i.e., air quality permits) and other permissions for the burn.

5.3 BIOREMEDIATION

Bioremediation activities may be subject to the same regulations and authorizations described for chemical countermeasure use as defined in Section 5.1 above, depending on site-specific conditions and desired use of the bioremediation agent. Any entity wanting to use bioremediation agents during an incident should contact the Federal OSC for more information. Biotreatment cells or land-farming cells for contaminated soils are likely subject to other solid waste management requirements but not necessarily Subpart J standards.

6.0 OTHER CONTINGENCY PLANS

This SACP was prepared under Section 311(j) of the CWA, as amended by OPA 90. This plan is intended to be fully consistent with and supportive of other private, local, state, regional, and federal plans as described in this section. It also functions as a part of the RCP and ACP for Region 8.

Private-Sector Response Plans

Private-sector response plans, including those for FRP facilities and pipelines, are structured and written as self-contained documents that serve as a complete reference tool for their operators during a spill response. These plans must be consistent with local, state, and federal government contingency plans. They must identify response personnel and equipment to be used to mitigate a worst-case discharge. Environmental, economic, and cultural sensitivity data, as well as response resources and other information required as part of private-sector response plans, must be consistent with this sub-area plan.

State and Local Response Plans

In addition to meeting the requirements for local emergency plans under SARA Section 303, state and local government agencies are encouraged to include contingency planning for responses consistent with the NCP, RCP, and ACP in all emergency and disaster planning (NCP Section 300.180).

Federal Response Plans

The U.S. EPA Region 8 RRT developed the RCP to coordinate timely, effective responses by various state and federal agencies and other organizations to discharges of oil or releases of hazardous substances. When implemented in conjunction with other federal, state, and local contingency plans, the RCP and ACP are designed to effectively facilitate removal of a worst-case discharge from a facility or vessel operating in Region 8, which includes the states of Colorado, Utah, and Wyoming,

The RCP provides the organizational structure and objectives necessary to prepare for and respond to a discharge of oil or release of hazardous substances, pollutants, and contaminants. It provides for timely and effective coordination and direction of federal, state, and local response systems, and supports development of capability for the private sector to handle such incidents.

The Region 8 RCP fulfills the requirements of the NCP for both RCP and ACP, and includes references to relevant portions of the National Response Framework (NRF), particularly Emergency Support

Function (ESF) #10 Hazardous Materials. The RCP implements the NCP and the ESF #10 component of the NRF at the regional level and is the chief working document of the RRT.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP)

The NCP (40 CFR Part 300), referenced repeatedly herein, created the National Response System. This provides the organizational structure and procedures to prepare for and respond to discharges of oil and releases of hazardous substances, including specific responsibilities among government agencies, descriptions of resources available for response, a summary of state and local emergency planning requirements, and procedures for undertaking removal actions under the CWA. This is the mechanism for coordinating response actions by all levels of government in support of the local incident commander and/or state or Federal OSC.

National Response Framework

The National Response Framework (NRF) (http://www.fema.gov/emergency/nrf/) was developed under the Disaster Relief Act of 1974, as amended by the Stafford Disaster Relief Act of 1988. The NRF established a foundation for coordinating federal assistance to supplement state and local response efforts to save lives, protect public health and safety, and protect property in the event of a natural disaster, such as a catastrophic earthquake or other incident declared a major disaster by the President. Response actions under OPA/CWA to discharges of oil are not managed through the NRF or the Disaster Relief Act.

Under the NRF, federal assistance is delivered through 15 annexes, or Emergency Support Functions (ESFs), each of which describes a single functional area of response activity. The Hazardous Materials Annex, ESF #10, addresses releases of oil and hazardous substances that occur as a result of a natural disaster or catastrophic event, and incorporates preparedness and response actions carried out under the NCP. The EPA serves as the chair of ESF #10 and is responsible for overseeing all preparedness and response actions associated with ESF #10 activities. The National Response Team and RRT departments and agencies serve as support entities.

An oil discharge may occur during a natural disaster; however, response to such an incident will not likely be conducted within the structure of the NRF. Specifically, this means the EPA and others may respond without the state's request for assistance and without a mission assignment from FEMA. In such cases, the oil response actions will still be coordinated by and communicated to the state Emergency Operations

Center and/or FEMA's Joint Field Office and other response agencies. However, funding, incident action planning, and operations will be largely independent of FEMA and state actions.

APPENDIX A

SUB-AREA CONTACT LIST

CONTACT LIST			
GREEN RIVER SUB-AREA			
Agency	**Name**	**Phone Number**	**Email Address**
U.S. EPA Region 8	Joyel Dhieux Kerry Guy	303-312-6647 303-312-7288	dhieux.joyel@epa.gov guy.kerry@epa.gov
Department of Interior - RRT Representative	Robert F. Stewart	303-445-2500	robert_f_stewart@ios.doi.gov
Bureau of Land Management - Vernal Field Office - Price Field Office	 Jerry Kenczka Floyd Johnson	 435-781-4440 435-636-3650	 jkenczka@blm.gov fljohnso@blm.gov
National Park Service - Dinosaur National Monument - Dinosaur National Monument	Dave Anderson Tamara Naumann Lee Buschkowsky	240-305-3203 970-374-3051 970-629-8683	d_l_adnderson@nps.gov tamara_naumann@nps.gov lee_buschkowsky@nps.gov
U.S. Fish and Wildlife Service - Colorado River Fishery Project - Vernal - Ouray National Wildlife Refuge - Browns Park National Wildlife Refuge - Seedskadee National Wildlife Refuge	 Tildon Jones Dan Schaad Steve Barclay Tom Koerner	 435-789-0351 435-545-2522 970-365-3613 307-875-2187	 tildon_jones@fws.gov dan_schaad@fws.gov steve_barclay@fws.gov tom_koerner@fws.gov
U.S. Fish and Wildlife Service - Utah Ecological Service Field Offices: - Salt Lake - Contaminant Specialist - Denver - Contaminant Specialist - Grand Junction - Contaminant Specialist - Cheyenne - Contaminant Specialist	 Chris Cline Brian Sanchez Barb Osmundson Kim Dickerson	 801-975-3330 ext. 145 303-236-4752 970-243-2778 ext. 21 307-772-2374 ext. 230	 chris_cline@fws.gov brian_c_sanchez@fws.gov barb_osmundson@fws.gov kimberly_dickerson@fws.gov
U.S. Bureau of Reclamation - Regional Office - Salt Lake - Flaming Gorge Dam	 Heather Patno Steve Hulet	 801-524-3883 435-885-3106	 hpatno@usbr.gov chulet@usbr.gov
Bureau of Indian Affairs			

CONTACT LIST			
GREEN RIVER SUB-AREA			
Agency	**Name**	**Phone Number**	**Email Address**
Utah Department of Emergency Management - Bureau Chief - Response and Recovery - LEPC State Liason	 Patrick Reid Mechelle Miller	 385-222-0823 801-707-1631	 preid@utah.gov mmiller@utah.gov
Utah Department of Environmental Quality	Neil Taylor Mike Zucker Scott Hacking Brent Everett	801-536-4102 801-536-4143 435-559-3825 801-536-4100	nbtylor@utah.gov mzucker@utah.gov scotth@utah.gov beverett@utah.gov
Utah School and Institutional Trust Lands Administration	Sonja Wallace	801-538-5108	swallace@utah.gov
Utah Division of Oil, Gas and Mining	Lisha Cordova	801-538-5296	lishacordova@utah.gov
Utah Department of Natural Resources - Wildlife Resources - Northeast Regional Office - Vernal	 Matt Breen Vernal Office	 435-790-9785 435-781-9453	 mattbreen@utah.gov
Wyoming Department of Environmental Quality	Joe Hunter	307-777-5885 307-432-1108 (pager)	joe.hunter@wyo.gov
Wyoming Game and Fish Department	Green River Regional Office	307-875-3223	
Colorado Department of Public Health and Environmental	Greg Stasinos	303-692-3023	greg.stasinos@state.co.us

CONTACT LIST			
GREEN RIVER SUB-AREA			
Agency	**Name**	**Phone Number**	**Email Address**
Colorado Parks and Wildlife - Northwest Region (Area 6) - Meeker - Northwest Region (Area 10) - Steamboat Springs	 Meeker Office Steamboat Office	 970-878-6090 970-870-2197	

Emergency Managers - Tribal and County			
Tribal			
Ute Tribe	Eldora Perank Bart Powaukee	435-725-4901 435-725-4821	eldorap@utetribe.com bartp@utetribe.com
Utah			
Carbon County	Jason Llewelyn	435-636-3251	Jason.llewelyn@carbon.utah.gov
Daggett County	Tamara Twitchell	435-784-3210	ttwitchell@daggettcounty.org
Duchesne County	Mike Lefler	435-738-1181	mlefler@duchesne.utah.gov
Emery County	Kyle Ekker	435-381-2404	kylee@esco.com
Garfield County	Chris Hatch	435-676-1123	gcso@color-country.net
Grand County	Rick Bailey	435-259-8115	rbailey@grandcountysheriff.org
San Juan County	Kelly Pehrson	435-587-3225	kpehrson@sanjuancounty.org
Summit County	Brian Bellamy	435-336-3247	bbellamy@summitcounty.org
Uintah County	Tal Ehlers	435-781-5466	tehlers@uintah.utah.gov
Wasatch County	Kent Berg	435-654-1661	kberg@co.wasatch.ut.us
Wayne County	Jeri Johnson	435-836-1319	jeri3287@gmail.com
Tri-County Health Department	Darrin Brown	435-247-1160	dbrown@tricountyhealth.com
Wyoming			
Carbon County	John Zeiger	307-328-2750	johnzeiger@carbonwy.com
Fremont County	Kathi Metzler	307-856-2374	fcema@wyoming.com

CONTACT LIST			
GREEN RIVER SUB-AREA			
Agency	**Name**	**Phone Number**	**Email Address**
Lincoln County	Jay Hokanson	307-885-3626	
Sublette County	Jim Mitchell	307-367-2284	jmitchell@subso.com
Sweetwater County	Dave Johnson	307-922-5370	johnsond@sweet.wy.us
Colorado			
Garfield County	Chris Bornholdt	970-625-8095	cbornholdt@garcosheriff.com
Moffat County	Tom Soos	970-824-6501	tsoos@moffatcounty.net
Rio Blanco County	Ty Gates	970-878-9620	ty.gates@rbc.us
Routt County	Bob Struble	970-846-1552	bstruble@co.routt.co.us
Industry			
Anadarko	Jeff Duncan	435-781-7030	jeff.duncan@anadarko.com
Chevron Pipeline	Jim Robbins	801-560-0822	jimrobbins@chevron.com
Newfield	Eric Sundberg	303-382-4470	esundberg@newfield.com
Plains Pipeline	Eric Heap	307-789-2322	ejheap@paalp.com
Tesoro	Brock Carter	801-521-4887	brock.c.carter@tsocorp.com
Pipelines - Refer to the Pipeline Emergency Contact Directory - Available on EPA's TERA Website			

CONTACT LIST			
GREEN RIVER SUB-AREA			
Agency	**Name**	**Phone Number**	**Email Address**
Moffat County	Tom Soos	970-824-6501	tsoos@moffatcounty.net
Rio Blanco County	Ty Gates	970-878-9620	ty.gates@rbc.us
Routt County	Bob Struble	970-846-1552	bstruble@co.routt.co.us
Industry			
Pipelines - Refer to the Pipeline Emergency Contact Directory - Available on EPA's TERA Website			

APPENDIX B

OIL SPILL RESPONSE TECHNIQUES

APPENDIX B: OIL SPILL RESPONSE TECHNIQUES

This appendix provides supplemental information to the SACP on response strategies for oil spills that may be appropriate for a variety of locations within the sub-area. A key component of the sub-area oil spill response planning effort is development of pre-planned response strategies. Field reconnaissance activities have occurred in coordination with the Sub-Area Committee to identify accessible control points along streams, rivers, and large water bodies (such as the Flaming Gorge Reservoir) where response strategies could be implemented relatively quickly. These SACP control points were identified and response strategies were developed to provide sufficient information to expedite and guide the initial response actions to a worst-case oil discharge. The selected control points were determined to be the best locations under normal flow conditions to contain/collect oil with the goal of protecting sensitive resources during the initial 24- to 72-hour response period when response equipment and resources are often limited. The control points and associated booming strategies for those locations are available on The Emergency Response Application (TERA) Viewer at the link provided below. In the event of a major oil spill incident, the incident specific planning will ultimate direct the operations and equipment needs for the long-term response actions.

EPA Region 8 TERA Viewer link: https://r8.ercloud.org/TERA_External/

The oil spill control points and response strategies presented on the TERA Viewer are intended to provide the basic information needed for oil spill response planning at those specific locations. Conversely, the response strategies/techniques discussed in this document are not site/location-specific and are intended for broad planning use. Facility- and incident-specific response plans should also be developed as required to supplement the sub-area planning efforts completed to date. It should be noted that sub-area response planning, including identification of oil spill control points and response strategies, is not a substitute for regulatory planning requirements that facilities may be subject to.

Per 40 Code of Federal Regulations, Part 300, (National Contingency Plan), Section 300.317, safety of human life is the highest priority during a response. Stabilizing the situation to prevent worsening of the event is the next priority. The response must use all necessary containment and removal tactics in a coordinated manner to ensure a timely, effective response that minimizes adverse impact on the environment. There are various techniques that emergency responders may use to control oil spills and minimize impacts to human health and the environment. A key to effectively mitigating oil spills is responding as quickly as possible to minimize the migration of oil and proper selection and use of equipment and materials best suited to the type of oil involved in the incident and appropriate for conditions at the spill site. Most spill response equipment and materials are greatly affected by

environmental factors such as water velocity/current and wind, and may vary to suit the size of the water body where the spill occurred. Oil-related damage to shorelines and threats to flora, fauna, and sensitive areas can be reduced by timely and proper use of response equipment.

Detailed below are techniques that can be utilized during an oil spill response. These techniques are most applicable for spills to small drainages, as well as larger rivers and streams. Additionally, detailed below is an approach (and subsequent strategies) that can be utilized on large open water bodies such as the Flaming Gorge Reservoir. Three oil spill response scenarios have been identified that are most likely within Region 8 and are all applicable for this sub-area. Those scenarios are:

- Dry ditches/coulees and small flowing streams/ditches
- Large flowing rivers/streams
- Open water bodies

For each of these scenarios, photographs of oil containment techniques that could be implemented during an incident are provided below. It should be noted that early stoppage of a spill source and quick containment will greatly reduce the scope of cleanup operations and environmental damage.

Vital to any response is the timely identification of locations where on-site activities can be successfully conducted. Some potential locations be predetermined during spill planning activities. Such locations should meet the following criteria: (1) accessible by truck (or boat) so that response personnel and equipment can efficiently collect and remove spilled oil, and (2) located within the oil flow path so that the spilled material can be intercepted/diverted, particularly at sensitive areas. These locations should be selected to avoid high flow/current conditions and areas with poor anchoring options.

Response Techniques for Dry Ditches/Coulees and Small, Flowing Streams/Ditches:

- Earthen dams
- Under flow dams (small, large, and T-pipe)
- Straw bale dams
- Wier dams
- Culvert block dams
- Sorbent boom
- Containment boom

Earthen Dam

Small Under Flow Dam

Large Under Flow Dam

T-Pipe Under Flow Dam

Straw Bale Dam

Wood Wier Dam/Culvert Block

Sorbent Boom

Containment Boom

Response Techniques for Large, Flowing Rivers/Streams:

- Containment Boom
- In-situ Burn/Fire Boom

As previously mentioned, as part of the ongoing sub-area planning activities within EPA Region 8, control points and response strategies have been developed to address worst-case discharge spill projections. Some of the control point locations and booming strategies identified for the larger rivers and streams within the sub-area are available on the TERA Viewer.

Response strategies to be implemented at each control point were developed for average/typical conditions (flow velocity, weather impacts, etc.). Response personnel must be knowledgeable and ready to modify the response strategies as needed to mitigate the threat, if unusual environmental conditions are encountered during a response. It should be noted there are condition-related limitations regarding the deployment of certain response equipment. These limitations are often associated with high flow conditions and flooding. Under high flow conditions, a primary objective is to limit the spread of oil within the flood zone and backwater areas. Health and safety of response workers must be taken into consideration under all circumstances.

Containment Boom

Under certain conditions, in-situ burning may offer a logistically simple, rapid, inexpensive, and relatively safe means for reducing impacts of an oil spill. Burning can substantially reduce need for

collection, storage, transport, and disposal of recovered material. Under certain circumstances, such as oil spilled under ice, burning may be the only viable response technique. In-situ burning may have significant short-term impacts (e.g., airborne release of particulate matter and hazardous substances, etc.), but may actually produce the lowest long-term impact because it removes the oil quickly. In-situ burning should augment, not replace, other oil spill response techniques such as mechanical removal. Burning often requires the use of fire boom as shown in the picture below. Other factors associated with in-situ burns are detailed in the strategies/priorities discussion for large, open water bodies section below.

Response Approach for Large, Open Water Bodies:

An oil spill to a large, open water body, such as the Flaming Gorge Reservoir, poses many challenges. Response strategies and techniques that should be considered during such a spill are discussed below. Once oil is released to an open water body, it will naturally spread, fragment, and disperse under the influence of wind, waves, and current.

Approach:

- Assess the amount and type of spilled oil via surveillance and tracking. Aerial flights may be warranted if the area/shoreline associated with a spill is large, and access to visually assess the spill is limited.
- Based on surveillance data, determine the most effective uses of response equipment. Response resources may be limited during the first 24 to 36 hours following a spill, so determination of where to mobilize resources is critical.
- Utilize existing information/plans to identify pre-existing control/access points where response activities can be implemented.

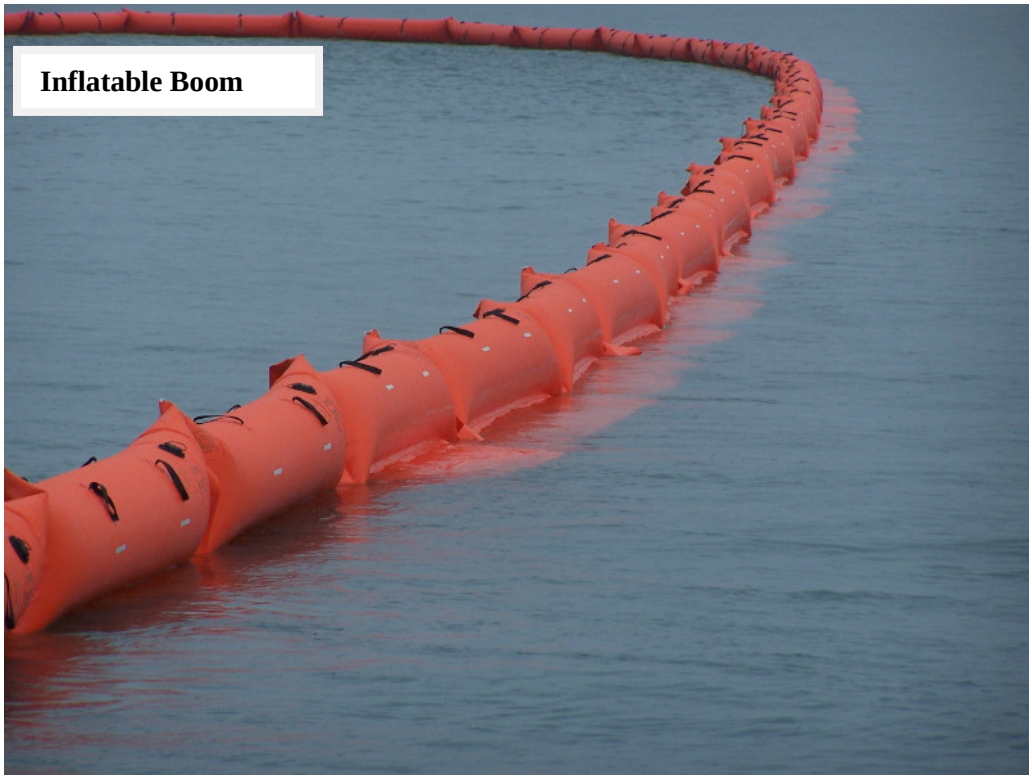
Strategies/Priorities for Large, Open Water Bodies:

The highest priorities during a response are safety and then stabilization. For an open water environment, in non-ice conditions, environmental factors (flow/current and wind in particular) will determine the oil flow path and locations where spilled oil will accumulate. Listed below are strategies/techniques that can be applied to an oil spill response on large, open water bodies. These strategies and techniques are not listed by priority. Response strategies implemented during the initial phases (24 to 72 hours) of a response will largely be dependent on access points and resource/equipment availability. All factors must be evaluated to ensure an effective response is conducted. Followup evaluation will be required as additional resources become available.

- Protection: Identify sensitive areas regarding human health and environment (drinking water intakes, critical habitats, etc.) that could be impacted by the spill. Implement response activities for protection of these areas. Response actions may include placement of deflection or protection boom to divert or prevent oil from impacting the sensitive area/receptor/resource. Based on the availability of oil spill equipment/boom, protection may not be feasible until additional equipment and boom become available.
- Containment: Based on initial surveillance information, identify where oil has accumulated and where collection can be performed most efficiently. These locations are likely to be in bays, inlets, and shoreline pockets. Containment boom can be used to either deflect oil into collection areas or to contain the oil so collection can occur. As a note, bay inlets on Lake Sakakawea can reach up to 1 mile in distance; therefore, implementation of this strategy may depend on the amount of required resources (boom). Large reels of inflatable boom may be

the best option for rapid deployment of boom. However, no inflatable boom is known to be currently located within the sub-area. Photographs of inflatable boom are included below.

- Collection: Additional techniques that can be used to collect oil in open water include corralling oil using two boats (working together) to drag containment boom (with trapped oil) to recovery sites, and use of open water skimmer boats. This method is slow and will be of limited benefit in significant wave and wind conditions.
- In-situ Burning: Oil accumulation may occur in areas where mechanical removal is more harmful or not practical, and in-situ burning may be preferred to reduce the long-term impacts to aquatic and riparian/shoreline ecosystems. This type of action must be well managed to ensure the fire will not damage other resources, and generally it will require an evaluation by the resource trustees and acquisition of emergency air release permits. Time is also a consideration for in-situ burning. The longer oil is exposed to the environment, the less likely it is to effectively burn.



Inflatable Boom

Inflatable Boom

APPENDIX C

THREATENED AND ENDANGERED SPECIES ALONG RIPARIAN CORRIDORS

	BIRDS																MAMMALS			
	Bald Eagle[1]	Black-Crowned Night Heron[2]	Black Tern[3]	Bobolink[4]	Canvasback[5]	Common Loon[6]	Greater Sage-Grouse[7]	Gunnison's Sage-Grouse[8]	Lesser Scaup[9]	Lewis's Woodpecker[10]	Mexican Spotted Owl[11]	Redhead[12]	Sandhill Crane[13]	(SW) Willow Flycatcher[14]	Virginia Rail[15]	White-Faced Ibis[16]	Yellow-Billed Cuckoo[17]	Little Brown Myotis[28]	River Otter[29]	Vagrant Shrew[30]	Western Red Bat[31]
Colorado																					
Garfield	X						X				X		X				X				
Moffat	X						X				X		X				X, PCH		X		
Rio Blanco	X						X				X		X				X				
Routt	X						X				X		X				X, PCH		X		
Utah																					
Carbon	X						X				X, CH						X				X
Duchense	X			X			X			X	X						X, PCH				
Emery	X						X				X, CH			X			X				
Garfield	X						X				X, CH			X			X				X
Grand	X			X			X	X		X	X			X			X				X
San Juan	X			X			X	X		X	X, CH			X			X, PCH				X
Sanpete	X						X				X						X				
Uintah	X			X			X			X	X						X, PCH				
Utah	X			X			X			X	X						X				
Wasatch	X			X			X			X	X						X				
Wayne	X						X				X, CH			X			X, PCH				X
Wyoming																					
Carbon	X	X	X		X		X		X		X	X	X	X	X	X	X	X		X	
Sweetwater	X	X	X		X	X	X		X		X	X	X	X	X	X	X	X			

X = May occur in county and has special status; CH = Critical Habitat in County; PCH = Proposed Critical Habitat in County

Federally Threatened, Endangered, or Candidate Species

1-39: See document **XYZ** for footnotes.

	FISH										REPTILES / AMPHIBIANS		PLANTS			
	Bluehead Sucker[18]	Bonytail Chub[19]	Colorado Pikeminnow[20]	CO River Cutthroat[21]	Flannelmouth Sucker[22]	Humpback Chub[23]	Mountain Sucker[24]	Mountain Whitefish[25]	Razorback Sucker[26]	Roundtail Chub[27]	Cornsnake[32]	Smooth Greensnake[34]	Autumn Buttercup[35]	Dudley' Bluff Bladderpod[36]	Dudley's Bluff Twinpod[37]	Ute Ladies' Tresses[38]
											Boreal Toad[33]					
Colorado																
Garfield				X			X									X
Moffat		X, CH	X, CH	X		X, CH	X		X, CH							X
Rio Blanco			X, CH	X			X							X	X	
Routt				X			X				X					
Utah																
Carbon	X	X, CH			X	X, CH		x	X, CH							
Duchense	X		X	X	X			x			X	X				X
Emery	X	X, CH	X		X	X, CH		x	X, CH		X	X				
Garfield	X				X			x					X			X
Grand	X	X, CH			X	X, CH		x	X, CH		X					
San Juan	X				X			x	X, CH		X					
Sanpete											X					
Uintah	X	X, CH	X, CH	X	X	X, CH		x	X, CH		X	X				X
Utah											X	X				X
Wasatch	X			X	X						X	X				X
Wayne	X				X			x	X, CH							X
Wyoming																
Carbon	X		X	X	X			X		X	X	X				X
Sweetwater	X		X		X			X		X						X

X = May occur in county and has special status; CH = Critical Habitat in County; PCH = Proposed Critical Habitat in County

Federally Threatened, Endangered, or Candidate Species

1-39: See document **XYZ** for footnotes.

BIRDS

1. Bald Eagle –Species of Concern (UT), Species of Special Concern (CO), Species of Greatest Conservation Need (WY)

Bald eagles may occur throughout the lower Green River watershed. This watershed is primarily used as wintering and roosting habitat although a few nests are present. Nests are almost always in tall trees near bodies of water where fish and waterfowl prey are available. Breeding tends to be initiated in April/May. Egg incubation lasts about 35 days and eaglets will fledge after 10-12 weeks. Eaglets remain dependent on the parents for a long period of time after fledging. Eagles will often use the same nest for many years. Winter habitat is associated with open water, though other habitats may be used if food resources, such as rabbit or deer carrion are available.

2. Black-Crowned Night-Heron - Species of Greatest Conservation Need (WY)

Black-crowned night-herons may occur in Carbon and Sweetwater counties in Wyoming. They are considered an uncommon summer resident in Wyoming. They inhabit marshes, swamps, wooded streams, and shores of lakes and ponds. They nest in colonies in emergent vegetation or in shrubs near the edge of water.

3. Black Tern - Species of Greatest Conservation Need (WY)

Black terns may occur in Carbon and Sweetwater counties in Wyoming. They are considered common summer residents in Wyoming. They inhabit biologically rich marshes and aquatic areas, and usually prefer marshes or marsh complexes greater than 50 acres. They nest in small, loose colonies, generally in areas of still water, with 25% to 75% of the surface covered by emergent vegetation, and well-interspersed with open water.

4. Bobolink –Species of Concern (UT)

Bobolinks may occur in Uintah, Duchesne, Wasatch, Utah, Sanpete, Carbon, Grand, Emery, Wayne, Garfield, and San Juan counties in Utah. Breeding is restricted to wet meadows or flooded pastures. Bobolinks tend to arrive in Utah in May and most begin their southerly migration in August/September. Some birds may stay in Utah throughout the year.

5. Canvasback - Species of Greatest Conservation Need (WY)

Canvasbacks may occur in Carbon and Sweetwater counties in Wyoming. They are considered uncommon summer residents. Canvasbacks require deep, open, permanent ponds, marshes and potholes for feeding, resting, and courtship activities. Breeding may occur in small lakes, deep-water marshes, sheltered bays of large freshwater and alkali lakes, permanent and semi-permanent ponds, sloughs, potholes and shallow river impoundments. Brood rearing often takes place in the same habitat as breeding.

6. Common Loon - Species of Greatest Conservation Need (WY)

Common loons may occur in Sweetwater County, Wyoming. Common loons are considered uncommon summer residents. Lakes that are suitable for breeding are extremely limited in Wyoming. Breeding lakes are deep and clear with islands or protected shorelines for nesting and raising young. These lakes occur between 6000 – 8000 feet in elevation, must be > 10 acres, and relatively free of human disturbance. Ideal nesting lakes also generally have at least partially forested, rocky shorelines; an area of shallow water with emergent vegetation; and a steep slope adjacent to the shoreline for an underwater approach to the nest.

7. Greater Sage Grouse – Federally Proposed as Threatened, Species of Special Concern (CO), Species of Greatest Conservation Need (WY)

Greater sage-grouse occur throughout the Lower Green River Basin in Wyoming, Colorado, and Utah and are obligate users of sagebrush habitat. In spring, greater sage-grouse breed on leks established by males in relatively open areas (e.g., windswept ridges). After breeding, females distribute and establish nests at sites with a native grass and forb understory, adequate cover, and structural diversity. In late summer and into fall, females with broods typically move to more mesic, brood-rearing habitat that includes riparian areas, wet meadows, streambeds and other natural waterbodies.

8. Gunnison's Sage-Grouse – Federally Threatened, Species of Special Concern (CO), Sensitive Species (UT)

In the Lower Green River Basin, Gunnison sage-grouse may occur in San Juan and Grand counties in southwestern Utah. Similar to greater sage-grouse, Gunnison sage grouse are obligate users of sagebrush habitat and breed on leks established by males in relatively open areas. After breeding, females distribute and establish nests at sites with a native grass and forb understory, adequate cover, and structural diversity. In late summer and into fall, females with broods typically move to more mesic, brood-rearing habitat that includes riparian areas, wet meadows, streambeds and other natural waterbodies.

9. Lesser Scaup - Species of Greatest Conservation Need (WY)

Lesser scaup may occur in Carbon and Sweetwater counties in Wyoming. Preferred breeding habitats are permanent, intermittently exposed, and semipermanent wetlands > 2 acres in size. The primary brood habitat is permanent or semipermanent wetlands with emergent vegetation. Lesser scaup nest in uplands, usually close to the water's edge.

10. Lewis's Woodpecker – State Species of Concern (UT)

Lewis's woodpeckers may occur in Uintah, Duchesne, Grand, San Juan, Wasatch, and Utah counties in Utah. Breeding habitat consists of park-like ponderosa pine forests and may otherwise occur in burned-over Douglas-fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands, and in the fringes of pine and juniper stands, and deciduous forests, especially riparian cottonwoods. They prefer to winter in oak woodlands.

11. Mexican Spotted Owl – Federally Threatened, Critical Habitat, State Threatened (CO), State Threatened (CO), Sensitive Species (UT)

Mexican spotted owls may occur throughout the Lower Green River Basin. The owls are considered habitat specialist in that roosting and nesting habitats occur in mature or old-growth forest or rocky canyon habitats. They forage in a wider variety of habitats including managed and unmanaged forests, pinyon-juniper woodlands, mixed-conifer and ponderosa pine forests, cliff faces and terraces between cliffs, and riparian zones.

Mexican spotted-owl designated critical habitat is present in the Lower Green River Basin in Utah 1) along Desolation and Grays Canyon and west through the West Tavaputs Plateau in Emery and Carbon Counties and 2) Canyonlands National Park and the southern portion of Horseshoe Canyon in western San Juan, and eastern Wayne and Garfield Counties.

12. Redhead - Species of Greatest Conservation Need (WY)

Redheads may occur in Carbon and Sweetwater counties in Wyoming. They feed in large, deep (> 4 feet), open areas (> 1 acre) with submersed aquatic vegetation during the prelaying period. They use smaller, shallower permanent to semipermanent wetlands with blocks of dense emergent vegetation for nesting. Redheads may also inhabit cropland ponds, alkali lakes, sewage ponds, reservoirs, streams and oxbows.

13. Sandhill Crane – Species of Special Concern (CO), Species of Greatest Conservation Need (WY)

Sandhill cranes may occur in Garfield, Moffat, Rio Blanco, and Routt counties in Colorado, and Carbon and Sweetwater counties in Wyoming. Typical nesting habitat occurs in river valleys, marshes, and wet meadows of western and central Wyoming and northwest Colorado, particularly in ranching country where human populations are low. The cranes occupy wet-moist meadow grasslands, sedge meadows, irrigated native and introduced meadows, and marshes. Necessary components of fall pre-migration staging habitat are grain or alfalfa fields in close proximity to roosting sites in shallow lakes, marshes, or river bottoms.

14. (Southwestern) Willow Flycatcher – Federally Endangered, Sensitive Species (UT), Species of Greatest Conservation Need (WY)

Southwestern willow flycatchers may occur in Utah's Grand, Emery, San Juan, Wayne, and Garfield counties below 8,500 feet. The birds nest in the summer in riparian areas with dense willow/cottonwood/tamarisk stands and standing water, streams, pools, or saturated soils. While critical habitat has been designated, none exists within the Lower Green River basin.

15. Virginia Rail – Species of Greatest Conservation Need (WY)

Virginia rails may occur in Carbon and Sweetwater counties in Wyoming. They prefer warm, freshwater marshes with dense emergent vegetation interspersed with open water or mudflats. The species is most common in natural wetlands with irregular bottom contours, 0-6 inches water depths, and high abundance of invertebrates.

16. White-faced Ibis – Species of Greatest Conservation Need (WY)

White-face ibis may occur in Carbon and Sweetwater counties in Wyoming. They are considered uncommon summer residents. They inhabit marshes, wet-moist meadows, lakes, and irrigated meadows. They nest on the ground in bulrushes, cattails, or reeds; on a floating mat; or in low trees. They usually forage close to emergent vegetation.

17. Yellow-Billed Cuckoo – Federally Threatened, Proposed Critical Habitat, Species of Concern (CO), Sensitive Species (UT)

Yellow-billed cuckoos may occur throughout the Lower Green River basin from May through September. They inhabit cottonwood, willow, and tamarisk stands in riparian areas with thick understories. Proposed critical habitat for yellow-billed cuckoos exists 1) along the Yampa River in Moffat and Routt counties in Colorado; 2) along the Green River in Uintah County, Utah, from Horseshoe Bend through the confluence of Duchesne and White Rivers; 3) along Pigeon Water Creek and Lake Fork River in Duchesne County, Utah; and 4) along the Green River in San Juan and Wayne Counties, Utah.

FISH

18. Bluehead Sucker – Sensitive Species (UT); Species of Greatest Conservation Need (WY)

Bluehead suckers may occur throughout most of the Lower Green River Basin. They are native to the Colorado River Basin, and the Upper Snake River Basin. They occupy mainstem and tributaries of large rivers. Fast flowing water in high gradient reaches of mountain rivers provides important habitat. Large adults are associated with deep pools, undercut banks, moderate to fast current velocities, and rocky substrates.

19. Bonytail Chub – Federally Endangered, Critical Habitat, State Endangered (CO); Sensitive Species (UT)

The bonytail chub (bonytail) is not known to naturally reproduce in the Lower Green River basin. The species is currently propagated in hatcheries, stocked in the Green and upper Colorado Rivers, and closely monitored.

Critical habitat for the bonytail within the Lower Green River basin includes; 1) the Green and Yampa Rivers within Dinosaur National Monument (Uintah County, Utah; Moffat County, Colorado); 2) the Green River in Desolation and Gray Canyons (Emery, Grand, Uintah, Carbon Counties, Utah) from Swasey's Rapid to Sumner's Amphitheater.

20. Colorado Pikeminnow – Federally Endangered, Critical Habitat, State Threatened (CO), Sensitive Species (UT)

Preferred adult habitat includes deep eddies, pools, runs and seasonally flooded habitats such as bottomlands, tributary mouths, side canyons, and eddies. Colorado pikeminnow occur in the 1) mainstem Green River from its confluence with the Colorado River to the upper reaches of Lodore Canyon in Moffat County, Colorado; 2) in the Yampa River from its confluence with the Green River upstream to near Craig, Colorado (Moffat County); 3) in the Little Snake River from its confluence with the Yampa River (Moffat County, Colorado) upstream into Wyoming (Carbon County); 4) in the White River from its confluence with the Green River (Uintah County, Utah), upstream to Taylor Draw Dam and Kenney Reservoir near Rangely, Colorado (Rio Blanco County); 5) in the lower portion of the Duchesne River in Duchesne County, Utah; and 6) the lower portions of the San Rafael and Price Rivers in Emery County, Utah.

Spawning occurs in late spring and early summer in cobble-bottomed riffle areas present in the lower Yampa River in Yampa Canyon and in the lower Green River in Desolation Canyon (Uintah, Carbon County, Utah). In July/August larvae drift to nursery habitats characterized by low-velocity, shallow, channel margin-habitats primarily located in the middle Green River from Jensen, Utah, to the Duchesne River confluence.

Critical habitat for the Colorado pikeminnow within the Lower Green River basin includes 1) the mainstem Green River from the northern edge of Lake Powell to its confluence with the Yampa River in Dinosaur National Monument; 2) the Yampa River from its confluence with the Green River to Craig, Colorado (Moffat County), and 3) the White River from its confluence with the Green River (Uintah County, Utah) to Rio Blanco Lake west of Meeker, Colorado (Rio Blanco County).

21. Colorado River Cutthroat – Species of Special Concern (CO), Sensitive Species (UT), Species of Greates Conservatio Need (WY)

Colorado River cutthroat may occur in Garfiled, Moffat, Rio Blanco, and Routt counties in Colorado, Duchense, Uintah, and Wasatch counties in Utah, and Carbon County in Wyoming. They inhabit cold, clear water of high-elevation streams and lakes.

22. Flannelmouth Sucker – Sensitive Species (UT), Species of Greatest Conservation Need (WY)

Flannelmouth suckers may occur throughout most of the Lower Green River Basin. Although preferring large rivers with deep riffles and runs, they can also be found in smaller streams and sometimes in lakes. Juveniles select for slower current velocity habitats, such as backwaters, eddies, side channels, and shallow. They tend to occupy habitats lower in the drainage and exhibit overlap with white suckers

23. Humpback Chub – Federally Endangered, Critical Habitat, State Threatened (CO); Sensitive Species (UT)

Two populations of the humpback chub are known to occur in the Lower Green River Basin. These include 1) the Green River in Desolation and Gray Canyons (Emery, Grand, Uintah, Carbon Counties, Utah), and 2) the Yampa River in Yampa Canyon southwest of Craig, Colorado (Moffat County). Humpback chubs may also occur in the Green River in Whirlpool Canyon (Dinosaur National Monument, Uintah County, Utah) and within the lower 6 miles of the Little Snake River, upstream of its confluence with the Yampa River (Moffat County, Colorado).

Humpback chub complete their entire life cycle in canyons with deep water, swift currents, and rock substrates. Juveniles and subadults use shallow, low-velocity shoreline habitats, whereas adults use offshore habitats or greater depths. Spawning occurs in late spring over cobble bars and shoals adjacent to low-velocity shoreline eddies as flow decreases from spring runoff. Emerging larvae remain in the general vicinity of spawning areas.

Critical habitat for the humpback chub within the Lower Green River basin includes: 1) the Green River in Desolation and Gray Canyons (Carbon, Uintah, Emery, Grand Counties, Utah) from Swasey's Rapid to Sumner's Amphitheater; 2) the Green River from the southern end of Dinosaur National Monument upstream to its confluence with the Yampa River (Uintah County, Utah; Moffat County, Colorado); and 3) the Yampa River within Dinosaur National Monument (Moffat County, Colorado).

24. Mountain Sucker – Species of Special Concern (CO)

In Colorado, mountain suckers occur in headwater streams and some lakes in the Green, Yampa, and White River basins in northwestern Routt, Moffat, Rio Blanco, and Garfield Counties. The fish prefer clear, cold water streams with gravel substrate and spawn during spring and summer over gravel riffle. Specimens have been collected from Piceance Creek (White River Basin) and Steamboat Lake (Yampa River Basin).

25. Mountain Whitefish – Species of Greatest Conservation Need (WY)

Mountain whitefish may occur in Carbon and Sweetwater counties in Wyoming. They prefer large, deep, clear, cold rivers, but are tolerant of warmer water and higher turbidity than cutthroat trout. They inhabit low-gradient, main stem streams at least 50 feet wide. They are associated with habitats having pools greater than four feet deep at base flow.

26. Razorback Sucker – Federally Endangered, Critical Habitat, State Endangered (CO), Sensitive Species (UT)

Razorback suckers generally occur in flooded bottomland, backwater eddies, and low-gradient reaches of the mainstem Green River (mile 175 to 343), the lower Yampa River (13 mile mark, Moffat County, Colorado), and the lower portions of the White and Duchesne Rivers (Uintah County, Utah). Spawning occurs during spring runoff over cobble, gravel, and sand substrates at the mouth of the Yampa River (Moffat County, Colorado), White River (Uintah County, Utah) and in the Green River, upstream of Jensen, Utah (Uintah County).

Larvae emerge from spawning substrates in early summer and are transported downstream to off-channel nursery habitats in quiet, warm, shallow water. Important nursery habitats are located within the Green River between Desolation Canyon (Emery/Grand County, Utah) and Split Mountain (Dinosaur National Monument). Nursery habitat may also be present in floodplain depressions disconnected from the main channel after spring run-off.

Critical habitat for the razorback sucker within the Lower Green River basin includes 1) the mainstem Green River from the northern edge of Lake Powell to its confluence with the Yampa River; 2) the Yampa River form its confluence with the Green River to the mouth of Cross Mountain Canyon in central Moffat County, Colorado; 3) the lower 18 miles of the White River upstream of its confluence with the Green River (Uintah County, Utah), and 4) the lower 2.5 miles of the Duchesne River upstream of its confluence with the Green River (Uintah County, Utah).

27. Roundtail chub – Sensitive Species (UT), Species of Greatest Conservation Need (WY)

Roundtail chubs may occur throughout most of the Lower Green River Basin in Utah and Wyoming. They prefer large rivers with undercut banks, woody debris, and boulders. They are most often found in pool-riffle habitats or murky pools near strong currents.

MAMMALS

28. Little Brown Myotis – Species of Greatest Conservation Need (WY)

Little brown myotis may occur in Carbon and Sweetwater counties in Wyoming. They occupy coniferous forest, riparian areas in the mountains and lower valleys, woodlots, shelterbelts, and urban areas up to about 11,000 feet. It is seldom found far from open water. During summer, the little brown bat may use buildings, tree cavities, loose tree bark, bridges, rock crevices, caves, and abandoned mines as roost sites. During winter, they hibernate primarily in caves and abandoned mines.

29. River Otter – State Threatened (CO)

River otters may occur in Moffat and Routt counties in Colorado in the lower Yampa and Green Rivers. They live in riparian habitat, often in bank dens abandoned by beavers. They are active mostly at dawn and dusk. They breed in spring, but embryo implantation is delayed until the following winter.

30. Vagrant Shrew - Species of Greatest Conservation Need (WY)

Vagrant shrews may occur in Carbon County, Wyoming. They inhabit riparian shrub, moist meadow grasslands, bogs, and riparian or marsh habitats with moist soil within a variety of habitat types from sagebrush-grassland and mixed shrubland to conifer forest. They prefer areas with accumulated leaf litter and rotting logs.

31. Western Red Bat – State Species of Concern (UT)

Western red bats may occur in Grand, Wayne, Carbon, Garfield, San Juan counties in Utah. They are extremely rare in Utah, but are typically found near water in wooded areas. Some bats may hibernate during the winter, although most migrate south to warmer climates. They eat insects and often forage in riparian areas.

REPTILES / AMPHIBIANS

32. Cornsnake – State Species of Concern (UT)

Cornsnakes may occur in Grand and San Juan counties in Utah. They are typically found near streams or in rocky forest habitats.

33. Boreal Toad (Western and Eastern) – State Endangered (CO), State Species of Concern (UT), Species of Greatest Conservation Need (WY)

Boreal toads may occur in Routt County, Colorado; Carbon County, Wyoming; and the Wasatch and Uintah Mountains within Wasatch, Utah, Sanpete, Duchesne, Emery, and Uintah counties, Utah. They occur at elevations between 7,500 and 12,000 feet in the vicinity of lakes, wet meadows, and wetlands in subalpine forests.

34. Smooth Greensnake – State Species of Concern (UT), Species of Greatest Conservation Need (WY)

Smooth greensnakes may occur in Uintah, Duchesne, Emery, Wasatch, and Utah counties in Utah and Carbon County, Wyoming. They inhabit moist grassy areas and meadows where the snake is well-camouflaged.

PLANTS

35. Autumn buttercup – Federally Endangered

Autumn buttercups occur in western Garfield County, Utah, in the Sevier River Valley. They occur with common wetland species in perennial wet meadows and islands of drier peaty hummocks.

36. Dudley's Bluff Bladderpod – Federally Threatened

Dudley's bluff bladderpod occurs in Rio Blanco County, Colorado, within the Piceance Basin. It occurs on white shale outcrops exposed through erosion and down-cutting of streams. Specifically, it can be found on level surfaces on points of ridges and isolated, white shale outcrops

37. Dudley's Bluff Twinpod – Federally Threatened

Dudley's bluff twinpod occurs in Rio Blanco County, Colorado, within the Piceance Basin. It occurs on white shale outcrops exposed through erosion and down-cutting of stream. Specifically, it can be found on steep sideslopes in these areas.

38. Ute Ladies'-tresses – Federally Threatened

Ute ladies'-tresses may occur in Uintah, Duchesne, Garfield, Utah, Wasatch, and Wayne counties, Utah; Garfield and Moffat counties, Colorado; and Sweetwater and Carbon counties, Wyoming. They are found on riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows.

APPENDIX D

ENDANGERED FISH LOWER GREEN

Colorado Pikeminnow

The Colorado Pikeminnow is endemic to the Colorado River Basin and was formerly widespread and abundant in warm-water streams and rivers of the basin. Colorado Pikeminnow persist in all three major river and tributary systems of the upper basin, but populations are severely reduced in all but the Green River Sub-Basin. The distribution and abundance of Colorado Pikeminnow in the rivers of the Upper Colorado Basin have been adversely affected by such factors as construction and operation of dams, reductions in flows, and introduction of nonnative fish. Flaming Gorge Dam altered the distribution and status of the Colorado Pikeminnow in the Green River and has mostly eliminated them from areas upstream of the Yampa River confluence.

Wild, self-sustaining populations of Colorado Pikeminnow are found only in the Upper Colorado River Basin. Adults (age 7+) and sub-adults (ages 2 to 6) are the most widely distributed of the age classes. The age classes occur in the mainstem Green River from its confluence with the Colorado River to the upper reaches of Lodore Canyon. Adults also occur in the Yampa River upstream to near Craig, Colorado, in the Little Snake River from its confluence with the Yampa River upstream into Wyoming; in the White River upstream to Taylor Draw Dam and Kenney Reservoir; in the lower portions of the San Rafael and Duchesne rivers; and in the lower (89) miles of the Price River. Juvenile Colorado Pikeminnow occur principally in the Green River, upper Colorado River, and Yampa River.

Distribution and patterns for the Colorado Pikeminnow vary among life stages and seasons, and these patterns illustrate that a variety of habitat types are needed to support the species. During most of the year, adults are widely distributed, and individuals appear to occupy home ranges. However, distribution changes in late spring and early summer, when most mature fish migrate to spawning areas. In the Green River Sub-Basin, spawning locations occur in the lower Yampa River in Yampa Canyon and in the lower Green River in Desolation Canyon. Spawning sites are in cobble-bottomed riffle areas. Adults remain in the vicinity of spawning areas for 3 to 8 weeks before returning to home ranges. Typical habitats for home ranges include deep eddies, pools, and runs. When such areas are available during the spring runoff period, adults and sub-adults use seasonally flooded habitats such as flooded bottomlands, flooded tributary mouths, flooded side canyons, and eddies.

Eggs hatch within 5 to 7 days, and larvae emerge from spawning substrate 5 to 7 days later. This typically occurs in July/August. Larvae are swept downstream, sometimes for a considerable distance. Larvae drift to relatively low-gradient river reaches (backwaters) where low-velocity, shallow, channel margin-habitats are common, and they use these habitats throughout their first year. Nursery habitats are

primarily located in sandy, alluvial regions. In the Lower Green River Basin, nursery habitat occurs primarily in the Middle Green River from Jensen, Utah, to the Duchesne River confluence. Historically, Echo and Island parks on the upper Green River were also utilized as nursery habitat.

Sub-adults continue to use backwaters and other low-velocity nearshore areas for several years, and then gradually shift to habitats more commonly used by adult fish (e.g. eddies, pools, and runs). Sub-adults are also found in the White River and other tributaries, but few are located in the Yampa River upstream of Yampa Canyon.

Spring peak flows are thought to provide cues to adults to migrate to spawning areas. These flows also affect the suitability of spawning conditions. High flows mobilize coarse sediment to building or reshape cobble bars, and they create side channels that can be used for spawning. Peak flows can also reshape backwater nursery habitats by increasing height of sandbars.

Razorback Sucker

The Razorback Sucker is endemic to the Colorado River Basin and was once widely distributed in warm-water reaches of the larger rivers of the basin. There appears to be some evidence of reproduction in the larger populations; natural survival of fish past the larval stage appears extremely low. Natural populations are primarily comprised of older fish. The lack of recruitment has been attributed mainly to the cumulative effects of habitat loss and modification caused by water and land development, as well as predation on young fish by non-native fishes.

Small populations are located in the Upper Colorado River Basin. In 2003, less than 100 individuals were thought to remain in the Middle Green River. Since construction of the Flaming Gorge Dam, most Razorback Suckers have been caught from the mainstem Green River (mile 175 to 343) and the lower Yampa River (13 mile mark). The largest concentration of the species exist in low-gradient flat water reaches of the Middle Green River between and including the lower portions of the Duchesne and Yampa rivers. This area includes the greatest amount of floodplain habitat in the Upper Colorado River Basin. Habitats used by sub-adults and adults include deeper runs, eddies, backwaters, and flooded bottomland habitats in the spring; runs and pools over submerged sandbars in summer; and low-velocity runs, pools, and eddies in winter. Juveniles require nursery environments with quiet, warm, shallow water, such as flooded tributary mouths, backwaters, or inundated floodplain habitats.

Razorback Suckers make annual spawning runs to specific river areas. In the Green River, the species spawns between April and June over cobble, gravel, and sand substrates during spring runoff. Three

spawning areas have been identified in the Green River Sub-Basin – at the mouth of the Yampa River and in the Green River, upstream of Jensen, Utah, and one on the White River.

Larvae emerge from spawning substrates and are transported downstream by the current into off-channel nursery habitats with quiet, warm, shallow water (e.g., flood tributary mouths, backwaters, and flooded bottomland habitats). This typically occurs in late May/June. The most important of these habitats are located between Split Mountain and Desolation canyons on the Green River. Flooded bottomland habitats that provide nursery habitats are inundated during high spring-runoff flows. Some floodplain depressions are capable of retaining water after main channel flows recede, and these areas are thought to provide the most beneficial nursery habitat conditions for larval and juvenile fish. When these depressions reconnect with the main channel during the high flows, the fish can return to the main channel.

Humpback Chub

The Humpback Chub is endemic to the Upper Colorado River Basin. The species occurs primarily in relatively inaccessible canyons and were rare in most early collections.

Two populations of the Humpback Chub are known to occur in the Green River Basin. The locations are the: 1) Desolation and Gray canyons in the Green River, and 2) Yampa Canyon in the Yampa River. Few Humpback Chubs have also been located in the Green River in Dinosaur National Monument, primarily in Whirlpool Canyon; and from the Little Snake River about 6 miles upstream of its confluence with the Yampa River.

Humpback Chub complete their entire life cycle in canyons with deep water, swift currents, and rock substrates. Juveniles and sub-adults use primarily shallow, low-velocity shoreline habitats, whereas adults use primarily off-shore habitats or greater depths.

Humpback Chub spawn from April to June over cobble bars and shoals adjacent to low-velocity shoreline eddies as flow decreases from annual spring peak. Emerging larvae do not drift extensively, but instead remain in the general vicinity of spawning areas. Young fish require low-velocity shoreline habitats, including eddies and backwaters. Humpback Chubs mature in 2-3 years and may live up to 30 years.

Bonytail Chub

The Bonytail is the most endangered of the fish species. The Bonytail Chub (Bonytail) is endemic to the Colorado River Basin; however, currently, they are not known to naturally occur in the basin. The species is raised in hatcheries and efforts are undergoing to release the fish into the basin. In close coordination with the Sub-Area Committee, a general protection strategy was identified for the sub-area. The strategy has been developed with an emphasis on the protection of the four endangered fish species. The strategies are based on seasonal flows, which is the primary limiting factor. It should be noted that the strategies listed below do not replace the requirement for coordination and consultation during an incident with the trustees as required under the NCP.