Shoreline Cleanup and Assessment Technique (SCAT) for Inland Oil Spills

SCAT - Cleanup with the least amount of impact.

"The Science Team becomes the ethics of the response"

Multiple slides and information provided by:

U.S. Department of the Interior
U.S. Fish and Wildlife Service (US FWS)
National Conservation Training Center

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)

SCAT

The Endpoint: Removal of as much oil as possible without causing additional harm to the habitat.

Chalk Point, MD Spill April 2000, U.S. DOI

The Role of SCAT

- Conduct shoreline assessment surveys

(*generate data on shoreline types and oiling conditions*)

- Identify sensitive resources
- Determine the need for shoreline treatment

The Role of SCAT

- Recommend shoreline treatment methods
- Recommend treatment priorities
- Monitor treatment effectiveness and effects

SCAT Data Should Answer the Following Questions:

- Is treatment necessary at this site?
- What treatment methods are appropriate or recommended?
- What constraints are needed to protect sensitive resources?
- What is the priority for treatment at this site?

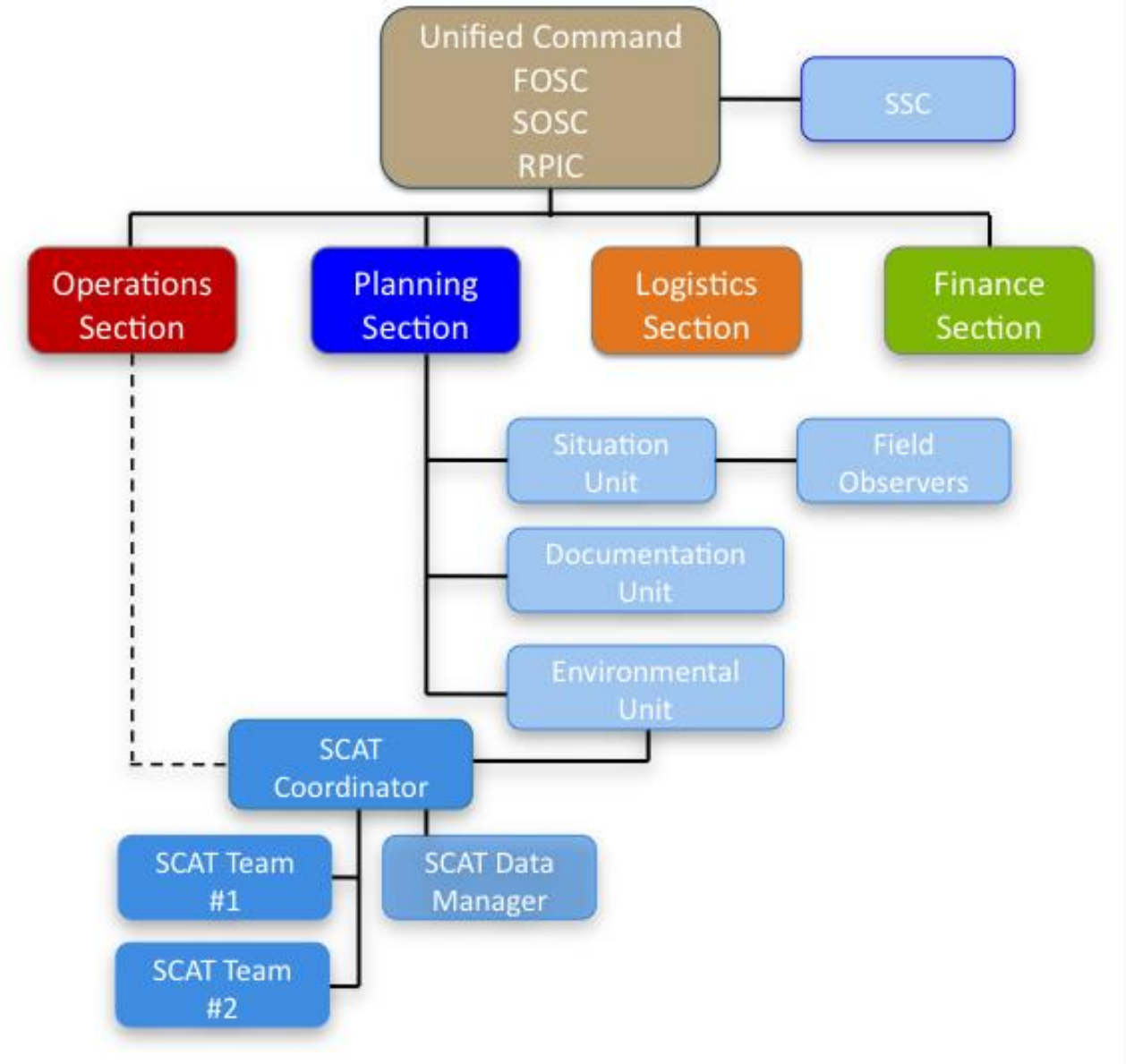
SCAT Response Structure:

SCAT is often placed in the Operations Section for large coastal responses.
SCAT can be placed in the Planning Section (Environmental Unit) for inland oil spills with complex habitat issues.

Reconnaissance is divided by Segments and Zones (Geographic districts)
Operational Segments are defined by oil recovery logistics

- If located in Planning SCAT teams must coordinate their activities constantly with OPS
  - Example OPS may have divisions (ex: Div A=spill site, Div B=Creek, Div C=River)

SCAT within the Unified Command



When dividing up the response to manageable units:

“1 Segment, many zones”

(ex: could have bridge-to-bridge with 2 segments, dozens of Zones

OPS Segments (Typically by letter (A, B, C)
OPS Zones (Typically by number (1, 2, 3)

SCAT Process Steps.

1. Conduct initial reconnaissance survey
2. Segment the shoreline by Habitat
3. Developing spill-specific cleanup guidelines and endpoints
4. Assign Teams and conduct detailed shoreline surveys

SCAT Process Steps

5. Generate reports and submit reports, sketches, photographs to Planning Section

6. Monitoring effectiveness of cleanup operations

7. Post-treatment inspections

8. Final evaluations of cleanup and “sign-off” of cleanup activities

SCAT Coordinator Duties

(or ENVL in smaller spills)

- Manages all things related to SCAT Teams
- Participates in developing Cleanup Endpoints and Treatment Methods
- Participates in Planning & Operations Section meetings
- Prepares Shoreline/Habitat Treatment Recommendations
- Briefs Env. Unit and Operations on issues related to shoreline treatment operations effectiveness and effects
- Data QA and oversight of all SCAT products
- Resolution of conflicts among stakeholders

SCAT Coordinator (continued)

- Must arrive at an oil spill and know what is needed to do for SCAT.

- Develop a SCAT plan, initial segmenting, pre survey planning
- Develop the SCAT Teams.
- Equip the teams: logistics for land recon, boats (and shore-mud recon), tidal mud flat recon, weather dress, etc.,
- Manage the teams, Ensure development of Health and Safety plans

The SCAT Coordinator must ensure a common opinion/estimate on degree of oiling *"coach them"* for a consistent evaluation between teams
(ex. what do these mean? - Trace – Sporadic – Patchy – Broken – Continuous)

SCAT Coordinator (continued)

- Coordinate with air branch: Assessment/Reconnaissance – flyovers
- Identify Stakeholders – work with OPS, PSC, PIO, SO
    - Identify Stakeholder Concerns; on site visits, listening sessions, educational materials
- provide support for IAP development,
- Provide Finalized Shoreland cleanup Treatment Recommendations (STRs) and Priorities.
- Provide cleanup endpoint recommendations.
- Implement the SCAT portions of ICS, help OPS with any implementation.

SCAT TEAM

A SCAT Team is a multi-agency team !

- Team Leader w/diverse subject matter experts:
- Agency Representatives
  - Natural Resource Trustees
  - Federal On-Scene Coordinator rep.
  - State On-Scene Coordinator rep.
  - Land Managers of public or Tribal Lands
- Landowners,
- Responsible Party Reps.
  - Environmental consultants
- Other Skills as needed
  - Safety
  - Archaeologist
  - SHPO/THPO*
  - Operations Section Liaison
  - Local resource experts

**State/Tribal Historic Preservation Officers*

Field Team Leader

- Should be the most experienced person in SCAT
- Responsible for management of the team
- Guides the team toward consensus on cleanup recommendations, priorities, special constraints, *and notes dissenting opinions.*
- Briefs the SCAT Coordinator, Planning, and Operations staff, as needed
- Acts as the team Safety Officer, equips their team (transportation/equipment/forms/supplies)
- Ensures that team members know SCAT abbreviations and acronyms and follow standard reporting language.

Field Team Leader (continued):

Completes the forms and sketches in the field.
Works With Landowners

Completes Shoreline Oiling Survey (SOS) report.
(Photographs, shoreline type, oiling conditions, habitat type, physical settings, sensitive resources)

Briefs Data to Planning (ENV.), OPS, and STIL.

Provide shoreline treatment recommendations (STRs) to OPS/Planning

Field Team Leaders

Field Team Leaders may request “hot-shot” cleanup crews to a zone

- Debris/Recon and cleanup of free product or Mousse
- Remove oiled debris
- Recover oiled wildlife

Know where and how to collect oil, what to protect.

Team Leaders - Keep ‘em Safe

Responder Risks:
SCAT is physically challenging, a lot of walking/difficult terrain, exposure to elements, stresses.
No bathrooms in field,
Lightning and dangerous weather

Safety:
Stings, bites, poisonous plants,
Fume exposure (proper respirator use)
No landowner permissions

Destress:
- The process will be more routine as days go by and IAP/Planning solidifies.

Team Leaders - Keep ‘em Safe

Risk Management Communication Process
- Provide Safety Briefing for each activity.

Every mission event (getting underway, transit, on-scene operations) has some level of risk and not all of the risks are known.

Float Plans Provide emergency planning and response contingencies to afford timely notification and assistance or rescue should a boat crew not return as planned.

SCAT Team Responsibilities

- Evaluate Oiling Conditions
  - Degree of oiling, percent cover, oil thickness, oil character, Residue, pore space filling, depth of oil reburial, etc.
- Factor in shoreline types, habitat type
- Identify the Sensitive Resources
- Determine the need for cleanup
- Recommend Cleanup methods and Endpoints
- Place constraints on cleanup if necessary, due to ecological, economic, or cultural concerns.

Team Members (Continued):

Generate the data

Fill out your forms

- Reports on segment location, priority, site access limitations, notes, photos

Communicate on logistics/location/safety to Team Leader/SCAT coordinator

Teams must know/ seek to obtain landowner permissions,
(generic public statement may be available for handout)

Teams must incorporate local knowledge.

Flag nearby sensitive resources, wildlife indicators

Recommending response endpoints
(Ex: no detectable oil, no longer generates sheen, further cleanup more harmful)

Reminder - Reconnaissance is three-dimensional. (buried oils in sediments, tides and currents, subsurface oiling conditions)

Team Members *(working notes)*

All team members working near oil must be “hazwoper” trained.
Self sufficiency for bringing lunches, staying hydrated, field dressed.

Daily duties:

- Check-In with Resource Unit Leader
- Confirm Assignment, get a safety briefing (HASP - *sign it*)
- Get briefing from SCAT Coordinator, PSC or Ops
- Report out with SITL at the end of each day
- Get your Operations Briefing – Turn in the ICS 204
- Deploy to assigned area
- Walk/Observe/Concur/Recommend
- Coordinate with OPs – Hot Shot Teams

Prepare for a long day in the field followed by reporting back at the command post !

Long Days and Fatigue. Even after a full day of field work, expect an evening full of coordination meetings and reporting.

Field Agency Representatives

- Assist in data collection on shoreline types, oiling conditions, and special considerations
- Provides expertise in resource sensitivity and priorities
- Recommends site-specific constraints or precautions to be followed during cleanup
- Makes recommendations on cleanup methods and priorities
- Monitors effectiveness of cleanup operations

SCAT Data Manager

- Creates base maps with segments, sensitive areas, etc. for SCAT teams to use in recording data
- Conducts Quality Assurance (QA) of daily SCAT forms
- Downloads the team's GPS track line to generate maps for the team to delineate segments, zones, treatment areas, pits, etc.
- Downloads and geo-references photographs
- Enters or supervises the entry of daily SCAT data
  - Develop e-forms specific to habitat types (ex: wetlands, forest floodplains
- Generates daily summary reports/maps of cleanup status, and data summaries requested by the UC

Shoreline Oiling Surveys (SOS)

- Confirm segment boundaries
- Using standard terms and codes to describe:
  - Habitat types
  - Surface oil conditions
  - Subsurface oil conditions
  - Special considerations (ecological, recreational, cultural)
- Delineate zones on a map, focusing on the oil and special considerations
- Discuss and agree upon cleanup recommendations and priorities

General Information on the Segment SOS

RIVER BANK SHORELINE OIL SUMMARY (SOS) FORM: _____ **Spill**_ **Page**____ **of** _____

1. GENERAL INFORMATION		**Date** (dd/Month/yyyy)	**Time** (24h standard/daylight) _____ : _____ to _____ : _____	**Water Level** Low / Mean / Bankfull / Overbank Falling / Steady / Rising
Segment ID:	**Bank:** L / R	**Segment Name:**		
Survey By: Foot ___ ATV ___ Boat ___ Helicopter ___ Other _____		Weather: Sun / Clouds / Fog / Rain / Snow / Windy / Calm		

2. SURVEY TEAM	Name	Organization	Name	Organization
Team Number				

3. SEGMENT	Total Length: meters	Length Surveyed: meters	Datum:
Survey Start GPS:	WP:	LAT: .	LONG: .
Survey End GPS:	WP:	LAT: .	LONG: .

4a. RIVER BANK TYPE: *Indicate only ONE Primary (dominant) type and ALL Secondary types. CIRCLE those OILED*

BEDROCK: Cliff___ Ramp ___ Shelf____
MAN-MADE: Solid _____ Permeable _____
Description: _____
ESI Shoreline Type (primary) _____ (secondary)_____

UNCONSOLIDATED: Clay___ Mud ___ Sand____ Mixed Fine ___ Shell ___ Mixed Coarse ___
Pebble-Cobble ____ Boulder ___ Rubble____ Marsh/Swamp___ Peat/Organics ___ Wooded ____
Vegetated ___
Other: _____

4b. OVERBANK / BACKSHORE TYPE: *Indicate only ONE Primary (P) and ANY Secondary (S) types.*

Cliff/Bluff: ____ ht. ____ m.
Sloped: > (5°) (15°) (30°)

Flat/Lowland/Field ____ Dune ____ Inlet/Channel ____ Delta ____ Lagoon ____ Marsh/Wetland _____
Man-Made: _____ : _____ Other: _____ Wooded / Vegetated? _____

4c. RIVER VALLEY CHARACTER: *Circle or select as appropriate.*

Channel Width: <10 m 10-100 m >100 m estimate _____m
Water Depth: >1 m 1-5 m >5 m estimate _____ m

Shoal(s) Present: Y/N Point Bar Present: Y/N
Bar-Shoal substrate: silt/sand/mixed/cobble/boulder/bedrock/debris

CHANNEL FORM: Cascade_____ Rapids _____ Pool_____ Riffle_____ Glide _____ Jam _____ Other: _____
RIVER FORM: Straight ____ Meander _____ Anastamosed _____ Braided _____ Other: _____
VALLEY FORM: Canyon _____ Confined or Leveed Channel _____ Flood Plain Valley _____ Other: _____

5. OPERATIONAL FEATURES	Oiled Debris? Yes / No	Type:	Amount: (bags/trucks)
Direct backshore access? Yes / No	Alongshore access from next segment? Yes / No	Suitable for backshore staging? Yes / No	
Access Description / Restrictions:		Current Dominated Channel? Yes/No	

River SOS Form

6. OILING DESCRIPTION: *Indicate 100% overlapping zones in different tidal zones by numbering them (e.g. A1, A2)*

Zone ID	WP # Start	WP # End	Substrate Type(s) Or ESI Code	River Bank Zone				Oil Cover						Oil Thickness					Oil Character							
								Area		Distribution		Size														
				MS	LB	UB	OB	Length (m)	Width (m)	Distr. % (>1)	or Number per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP	No

7. SUBSURFACE OILING CONDITIONS: *Format: Indicate Zone ID in Pit #, e.g., A-1, B-2, B-3, (use only number if not in zone, e.g., 4, 5)*

Pit #	WP	Substrate Type Surface/Subsurface	River Bank Zone				Pit Depth (cm)	Oiled Interval (cm-cm)	Subsurface Oil Character								Water Table (cm)	Sheen Color B,R,S,N	Clean Below Yes / No
			MS	LB	UB	OB			AP	OP	PP	OR	OF	TR	NO	%			
		/						-											
		/						-											
		/						-											
		/						-											

8. COMMENTS: *Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions*

Sketch / Map: Yes / No Photos/Video: Yes / No Numbers: (-) Photographer Name:

Wetland SOS Form

WETLAND SHORELINE OILING SUMMARY (S0OS) FORM: _____ **Spill** Page ___ of ___

1. GENERAL INFORMATION	Date (dd/Month/yyyy)	Time (24h standard/daylight) ___:___ to___:___	Tide Height
Segment ID:	Segment Name:		L / M / H
Ops Zone:	Survey Type:		Rising/Falling
Survey By: Foot/ATV/Boat/Helicopter/Overlook/Other_____		Weather: Sun / Clouds / Fog / Rain / Snow / Windy / Calm	

2. SURVEY TEAM	Name	Organization	Name	Organization
Team Number				

3. SEGMENT		Total Length: m	Length Surveyed: m	Datum: WGS84
Survey Start GPS:	WP:	LAT: .	LONG: .	
Survey End GPS:	WP:	LAT: .	LONG: .	

4a. WETLAND CHARACTER

Physical Setting: *Fringing Marsh / Tidal Channel / Marsh Interior / Mud Flat / Lagoon* / Other:

Wetland Type: Salt *Marsh / Fresh Marsh / Mangrove / Hardwood Bottomland* / Other:

Dominant Vegetation Type/Species: *Reeds / Grasses / Mangrove* / Other _____

4b. BACKSHORE CHARACTER *Indicate only ONE Primary (P) type and ALL Secondary (S) types*

Unconsolidated Bluff/Bank___Flat/Lowland ___Beach____Marsh/Wetland___Tidal Channel___Delta___Channel___Man-Made___

5. OPERATIONAL FEATURES	Oiled Debris? Yes / No	Type:	Amount (bags)
Direct backshore access? Yes / No	Alongshore access from next segment? Yes / No	Suitable for backshore staging? Yes / No	
Access description / restrictions:			
Surface bearing capability suitable for: Personnel / Marsh Vehicles / Other:			

6. SURFACE OILING CONDITIONS: Identify oil on vegetation vs. substrate by adding a V (for Vegetation) or an S (for sediment) after the Zone ID (e.g. AV, BV). Indicate overlapping zones in different tidal zones by numbering them (e.g. AV1, AV2)

Zone ID	WP zone start	WP zone stop	Tidal Zone				Oil Cover						Oil Thickness					Oil Character							Height of Oil on Plants (cm)
							Area		Distribution		Size														
			LI	MI	UI	SU	Length (m)	Width (m)	Dist % (>1) ☐	# per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	TC	SR	AP	No	
A																									

NOAA Shoreline Assessment Job Aid

Describe your geophysical setting

Sediment/substrate characterization and Shoreland type.

R **Bedrock Outcrop**

Boulder
>256 mm diameter B

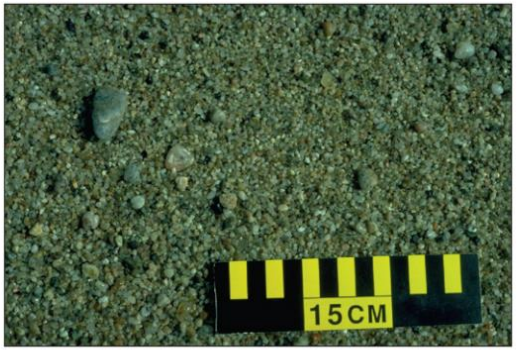
M **Mud**
silt and clay

NOAA Shoreline Assessment Job Aid

C **Cobble**
64–256 mm diameter

Pebble
4–64 mm diameter **P**

G **Granule**
2–4 mm diameter



Sand
0.06–4 mm diameter **S**

NOAA Shoreline Assessment Job Aid

1 Exposed Rocky Shores
(also includes exposed seawalls)

2 Exposed Rocky Platforms
(also includes clay scarps)

Shoreline Types:

3 Fine-grained Sand Beaches
(also includes scarps in sand)

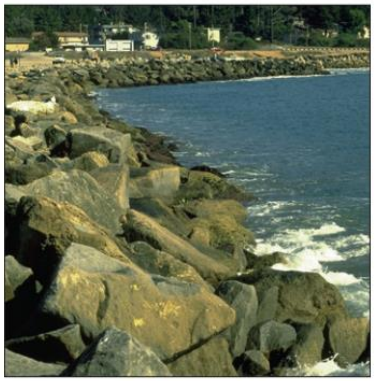
4 Course-grained Sand Beaches

5 Mixed Sand and Gravel Beaches
(also includes mixed sand and shell beaches)

NOAA Shoreline Assessment Job Aid

6a **Gravel Beaches**
(also includes shell beaches)

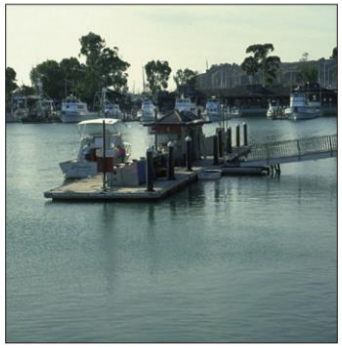
6b **Riprap Structures**



Exposed Tidal Flats **7**

8a **Sheltered Rocky Shores**

8b **Sheltered Man-made Structures**



Sheltered Tidal Flats **9**

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10a Salt to Brackish Marshes

10b Freshwater Marshes

10c Swamps

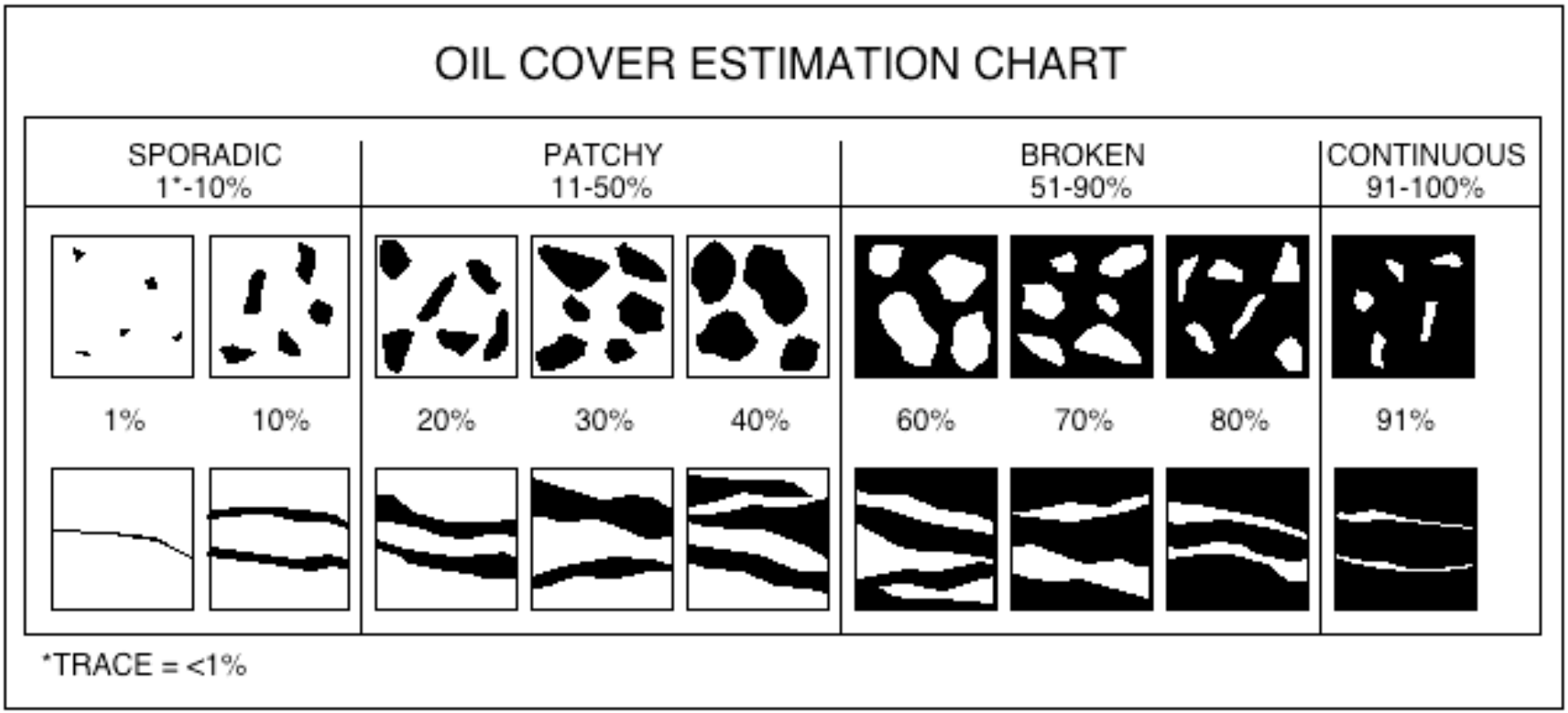
10d Mangroves

SCAT Terminology

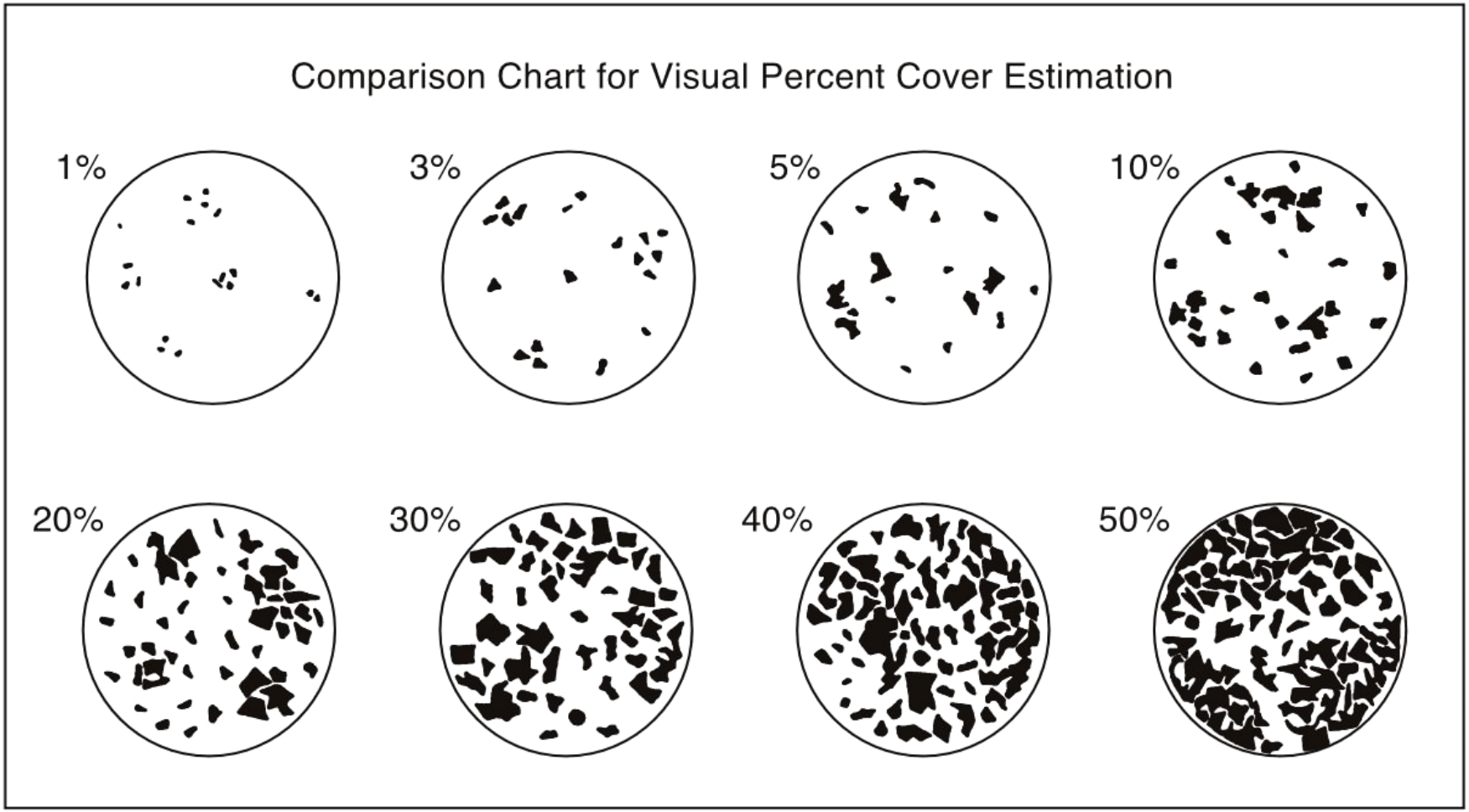
Surface Oil Distribution

C	Continuous	91-100% cover
B	Broken	51-90%
P	Patchy	11-50%
S	Sporadic	<1-10%
T	Trace	<1%

NOAA Shoreline Assessment Job Aid



NOAA Shoreline Assessment Job Aid



NOAA Shoreline Assessment Job Aid

C

Continuous (91-100% Cover)

B

Broken (51-90% cover)

NOAA Shoreline Assessment Job Aid

P

Patchy (11-50% cover)

S

Sporadic (1-10% cover)

So What Percent Cover is this?

More SCAT Terminology

Surface Oiling Descriptor – THICKNESS

PO	Pooled/Thick Oil (fresh oil or mousse > 1 cm)
CV	Cover (oil or mousse >0.1 cm to <1 cm on any surface)
CT	Coat (visible oil <0.1 cm, can be scraped off with fingernail)
ST	Stain (visible oil, cannot be scraped off with fingernail)
FL	Film (transparent or iridescent sheen or oily film)

NOAA Shoreline Assessment Job Aid

PO

Pooled /Thick Oil

Fresh or emulsified oil > 1cm thick

CV

Cover

Fresh or emulsified oil

0.1 - 1.0 cm thick

NOAA Shoreline Assessment Job Aid

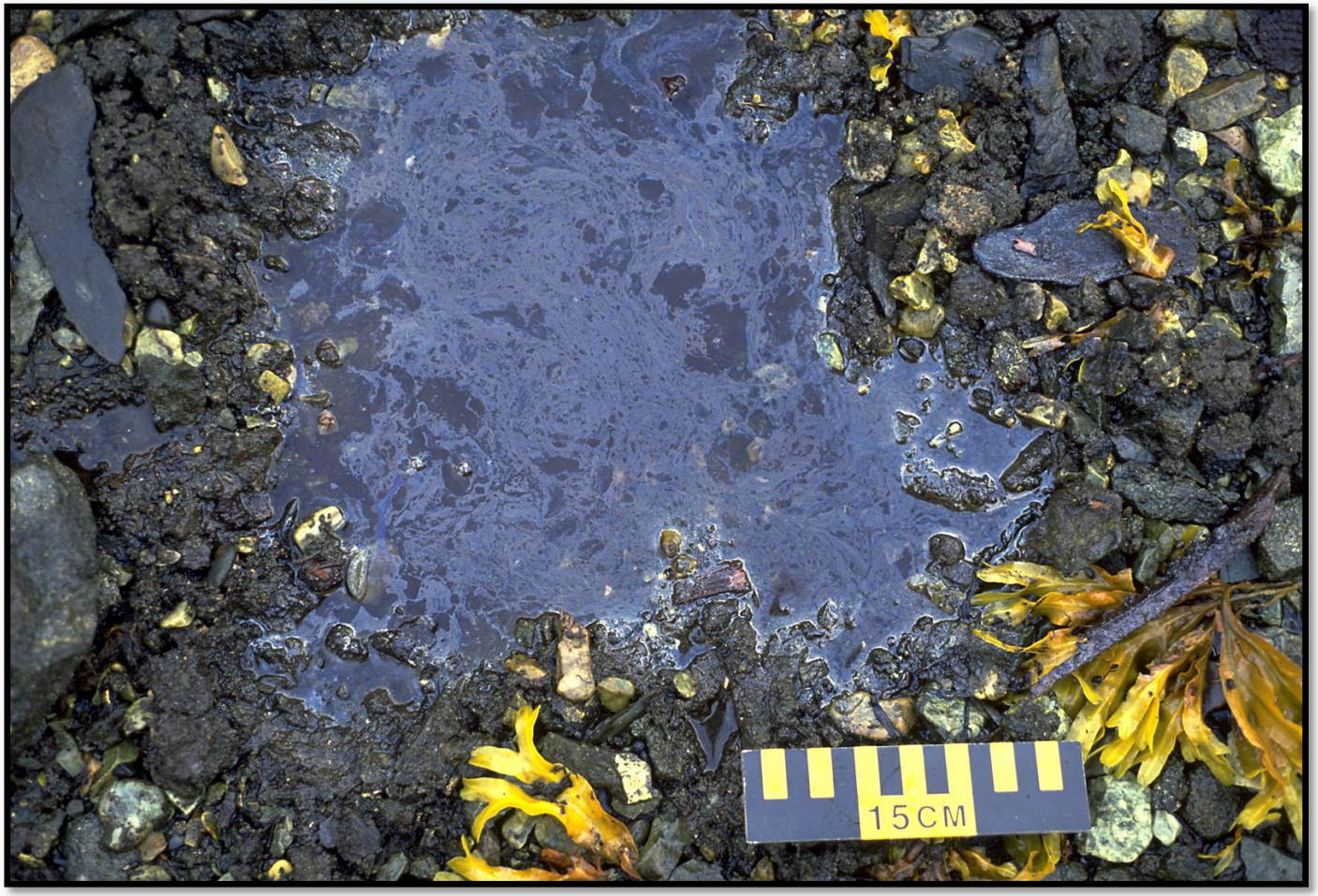
CT

Coat
Visible oil < 0.1cm
can be scraped off with fingernail

ST

Stain
Visible oil
that cannot be scraped off with fingernail

FL



Film

Transparent or iridescent sheen or oily film

More SCAT Terminology

Surface Oiling Descriptors

- The Character or Type of oil

FR	Fresh Oil (unweathered, liquid oil)
MS	Mousse (emulsified oil occurring over broad areas)
TB	Tarballs (discrete accumulations of oil <10 cm in diameter)
PT	Patties (discrete accumulations of oil >10 cm in diameter
TC	Tar (highly weathered oil, of tarry, nearly solid consistency)
SR	Surface Oil Residue (non-cohesive, oiled surface sediments)
AP	Asphalt Pavements (cohesive, heavily oiled surface sediments)
NO	No oil (no evidence of any type of oil)

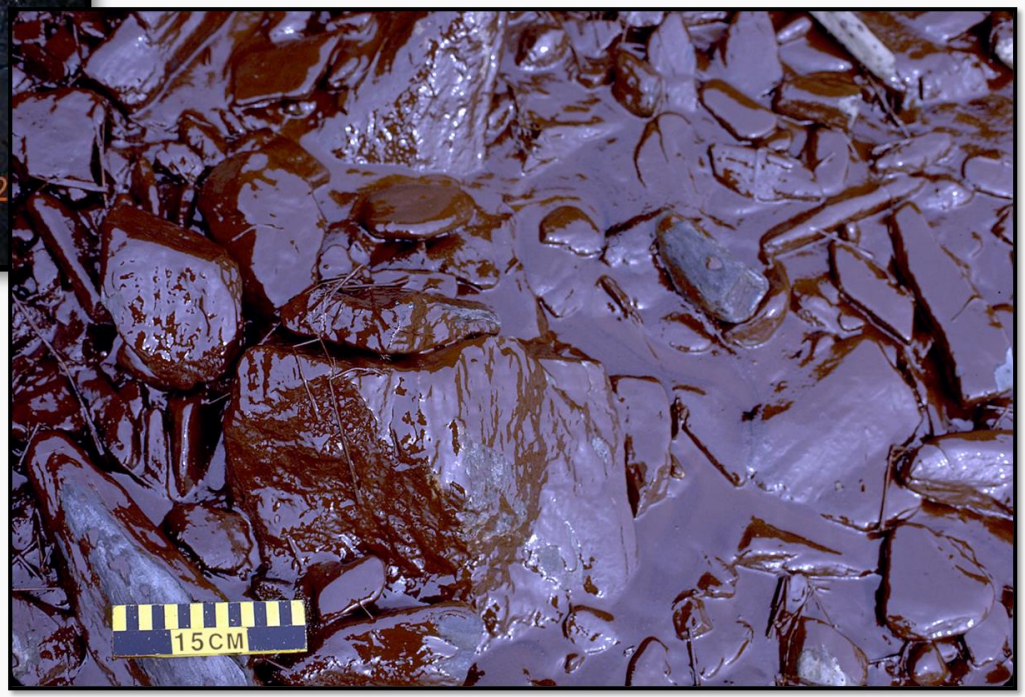
NOAA Shoreline Assessment Job Aid

FR

Fresh Oil
Unweathered liquid oil

MS

Mousse
Emulsified oil



NOAA Shoreline Assessment Job Aid

TB

Tar Balls

Discrete accumulations of oil
< 10 cm in diameter

PT

Patties

Discrete accumulations of oil
> 10 cm in diameter

TC

Tar

Highly weathered oil of nearly solid consistency

Surface Oil Residue

Non-cohesive, heavily oiled surface sediments

AP

Asphalt Pavement

Cohesive, heavily oiled surface sediments

SUBSURFACE !
describe oiling in 3-dimensions.

Subsurface Oiling Descriptors – Type

OP Oil-Filled Pores (pore spaces completely filled with oil)

PP Partially Filled Pores (oil does not flow out of the sediments when disturbed)

OR Oil Residue (sediments are visibly oiled with black/brown coat or cover on the clasts, but little or no accumulation of oil within the pore spaces)

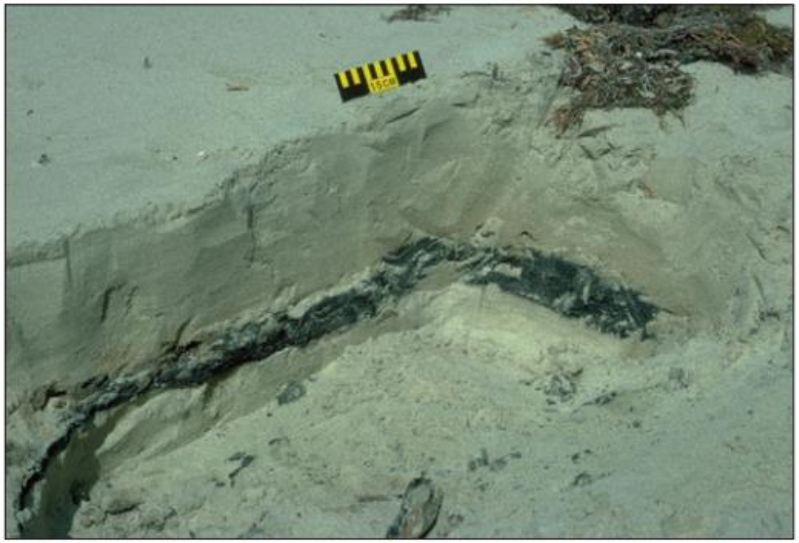
SAP Subsurface Asphalt Pavement (buried layer)

OF Oil Film (lightly oiled with a film)

SAP

Subsurface Asphalt Pavement
a buried layer of hardened oil

(seen here as black layer buried in a white sand beach)



Oil-filled Pores
pore spaces are completely filled with oil to the extent that oil flows out of sediments when disturbed

(seen here as brown oil pebbles)

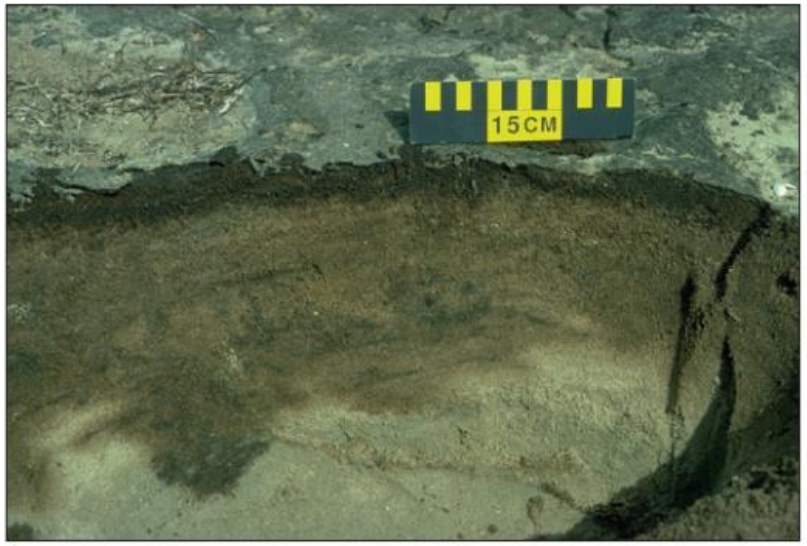
OP

PP

Partially Filled Pores
pore spaces filled with oil, but generally does not flow out when disturbed

Oil Residue
sediments visibly oiled with black/brown coat or cover on clasts, but little or no accumulation of oil within pore spaces

OR



OF

Oil-Film

Sediments are lightly oiled with an oil sheen or stain

INLAND STRANDED OIL HABITAT FACT SHEET FOR RESPONSE:

Deep Marsh Annual

I. Habitat Description

The deep marsh annuals habitat includes portions of lakes, ponds, marshes, or backwaters that are more than10% vegetated with wild rice (*Zizania*). While this habitat is dominated by wild rice, it may have inclusions of submersed, non-rooted-floating aquatics, rooted-floating aquatics, or emergent vegetation. Deep marsh annuals are typically found in areas which are flooded semi-permanently and have water depths between 0.25 and 2 meters with a silt or mucky bottom. During normal water conditions, there is little flow, though there can be wind-generated currents and stronger flows at inlets and outlets. During flood conditions, these habitats can be connected to rivers or streams, have strong currents, and the potential to carry large amounts of debris.

Wild rice beds in Northern Minnesota. Image: Ducks Unlimited

Wild rice in floating-leaf stage. Image: 1854 Treaty Organization

II. Sensitivity to Oil Spills

The deep marsh annuals habitat is highly sensitive to oil spills. This habitat is valuable to a variety of birds, amphibian, reptile, and mammal species as well as micro and macro invertebrates, many of which are extremely sensitive to chemical exposure. During normal water levels, oil would be less likely to penetrate water-saturated soils; during floods, oil could be deposited in areas that dry out after the flood, and penetrate the loose, organic-rich surface soils. Light refined oils with high amounts of water-soluble fractions can cause acute mortality to animals and plants. Flowering or seeded annuals are more vulnerable to contamination. It is difficult for more viscous oils to penetrate densely vegetated areas.

References/Additional Information:

General Classification Handbook for Floodplain Vegetation in Large River Systems (http://pubs.usgs.gov/tm/2005/tm2A1/)

Inland Oil Spills: Options for Minimizing Environmental Impacts for Freshwater Spill Response (http://www.michigan.gov/documents/deq/deq-wb-wws-FreshwaterResponse_NOAA102706_265069_7.pdf)

NatureServe (natureserve.org)

Natural Wetland Inventory (http://www.fws.gov/wetlands/)

The U.S. National Vegetation Classification (http://usnvc.org/)

Wetland Plants and Plant Communities of MN & WI, 3rd Edition (http://www.bwsr.state.mn.us/wetlands/delineation/WPPC_MN_WI/index.html)

Wild Rice
Zizania spp.

Merel R. Black

Habitat Fact Sheets.

Inland Oil Spill Pre-Planning.

Habitat Fact Sheets

Wet Meadow

Rooted-Floating Aquatics

The EPA has worked with ecological and oil spill scientists to develop specific cleanup recommendations based on sensitivities to disturbance and degree of cleanup.

Annual Shallow Marsh

Shallow Perennial Marsh

Wild Rice

Submersed Vegetation

Habitat Fact Sheets

Habitat Fact Sheets

- On the front is a detailed description of habitat type and sensitivity to oil spills.
- On the back side are recommended cleanup actions to take.
- There are typically 2 to 8 cleanup choices/habitat type

INLAND STRANDED OIL HABITAT FACT SHEET FOR RESPONSE:

Deep Marsh Perennial

Indicator Species

Arrowhead
Sagittaria spp.

Bur-Reed
Sparganium spp.

I. Habitat Description

The deep marsh perennials habitat includes portions of lakes, ponds, marshes, or backwaters that are semi-permanently flooded and more than 10% vegetated with persistent emergent vegetation dominated by pickerelweed (*Pontederia*), arrowhead (*Sagittaria*), cattail (*Typha*), or bur-reed (*Sparganium*). Invasive species include hybrid cattail (*T. latifolia*), which is distinguished by its intermediate features between the parental common and narrow leaf cattails. This habitat may have incursions of submersed, nonrooted-floating aquatics, rooted-floating aquatics, or other emergent vegetation and is typically found growing in water up to 1 meter deep. During normal water conditions, there is little flow, though there can be wind-generated currents and stronger flows at inlets and outlets. During flood conditions, these habitats can be connected to rivers or streams, have strong currents, and the potential to carry large amounts of debris.

Deep marsh perennials. Image: Ben Kimball

Invasive hybrid cattail. Image: WI DNR

II. Sensitivity to Oil Spills

The deep marsh perennials habitat is high sensitive to oil spills. This habitat is valuable to a variety of birds, amphibian, reptile, and mammal species as well as micro and macro invertebrates, many of which are extremely sensitive to chemical exposure. During normal water levels, oil would be less likely to penetrate water-saturated soils; during floods, oil could be deposited in areas that dry out after the

INLAND STRANDED OIL HABITAT FACT SHEET FOR RESPONSE:

Deep Marsh Annual

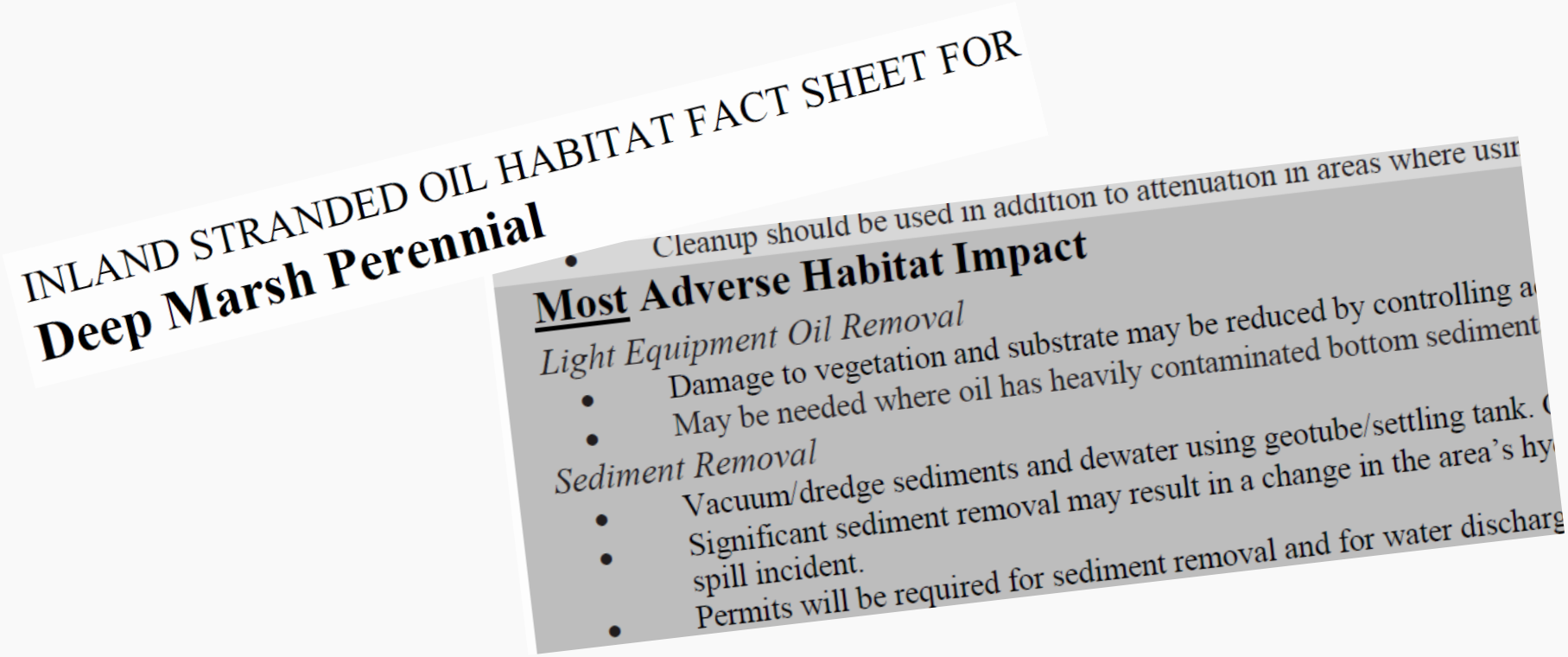
I. Habitat Description

The deep marsh annuals habitat includes portions of lakes, ponds, marshes, or backwaters that are more than10% vegetated with wild rice (*Zizania*). While this habitat is dominated by wild rice, it may have inclusions of submersed, non-rooted-floating aquatics, rooted-floating aquatics, or emergent vegetation. Deep marsh annuals are typically found in areas which are flooded semi-permanently and have water depths between 0.25 and 2 meters with a silt or mucky bottom. During normal water conditions, there is little flow, though there can be wind-generated currents and stronger flows at inlets and outlets. During flood conditions, these

Wild rice beds in Northern Minnesota. Image: Ducks Unlimited

Habitat Fact Sheets

The Sensitivity to Response Methods ranges from Least Adverse Habitat Impacts to Some Impacts to Most Adverse Impacts.



INLAND STRANDED OIL HABITAT FACT SHEET FOR

Deep Marsh Perennial

- Cleanup should be used in addition to attenuation in areas where usi

Most Adverse Habitat Impact

Light Equipment Oil Removal

- Damage to vegetation and substrate may be reduced by controlling a
- May be needed where oil has heavily contaminated bottom sediment

Sediment Removal

- Vacuum/dredge sediments and dewater using geotube/settling tank.
- Significant sediment removal may result in a change in the area's hy spill incident.
- Permits will be required for sediment removal and for water discharg

Habitat Fact Sheets

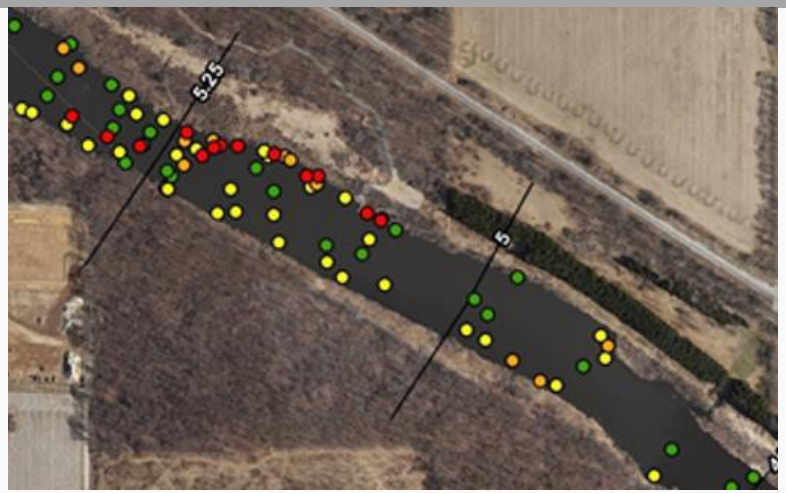
- Deep Marsh Shrub
- Calcareous Fen
- Floodplain Forest
- Open Water
- Rooted Floating Aquatics
- Sedge Meadow
- Shallow Marsh Annual
- Shallow Marsh Perennial
- Shallow Marsh Shrub
- Submersed Aquatic Vegetation
- Wet Meadow
- Bog
- Mudflat

Fact Sheets Located at **RRT5.org**

Mapping the SCAT Results

When displaying data from a SCAT Survey it is helpful to put it terms of Green/Yellow/Red for decision makers.

- Green: No oil observed (NOO)
- **Yellow**: No Further Treatment (NFT) recommended
- Red: Shoreline Treatment Recommendation (STR)



CLEANUP ENDPOINTS

Determine Cleanup Objectives:

- Minimize exposure hazards for human health
- Minimize treatment
- Speed recovery of impacted areas
- Reduce the threat of additional or prolonged natural resource impacts
- Meet Federal and State water quality and sediment quality standards/guidelines
- Protect T & E Species and habitat/vegetative biodiversity

CLEANUP ENDPOINTS

Other Goals:

- Gross removal then passive treatment
- Follow-up on effectiveness monitoring
- Natural Resource Damage Assessment and Restoration (NRDAR) support.

Expect an iterative approach to cleanup,

- there may have to be end point reconsiderations.
- there may be a better time for intervention later.

Report Backs:

- Cleanup may not be implemented properly,
- Cleanup method is no longer effective,
- Cleanup is causing more harm than good, etc.

Clearly State the Guidelines and Endpoints

- *No detectable oil*
- *No more than background*
- *No visible oil*
- *No longer generates sheen*
- *No longer rubs off on contact*
- *Removal only if it causes no more harm than natural attenuation*
- *No further treatment recommended*

  - documented decisions in detail

Cleanup Endpoints

- **Select useful "target" endpoints**
 (i.e., no more than 1 tarball per square meter)
- Apply techniques that may achieve that endpoint while limiting additional impact
- Constantly monitor to confirm endpoint success
- Modify endpoints or techniques as needed to reflect current conditions and unacceptable impacts resulting from treatment

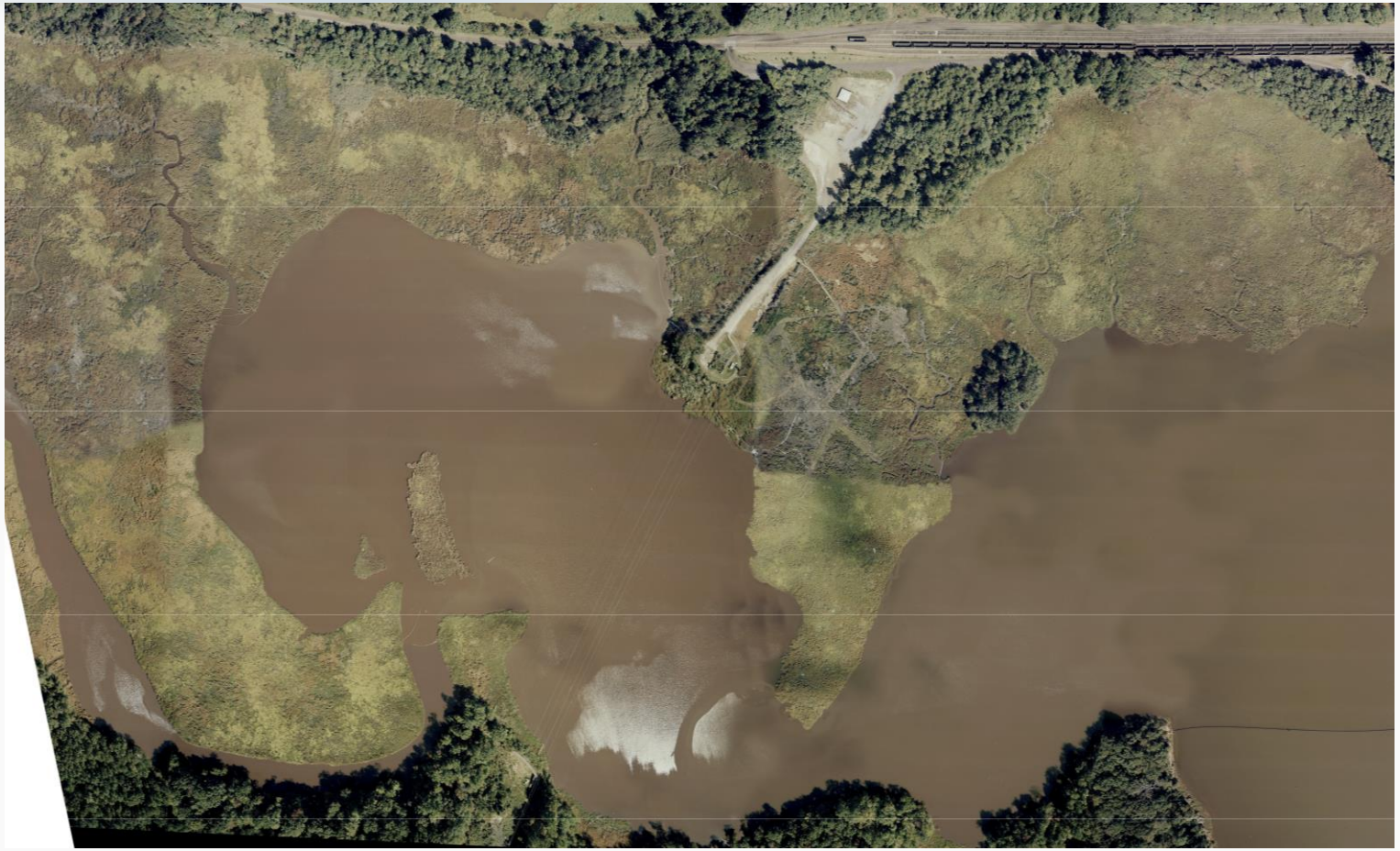
Stop work when it becomes:

- Ineffective
- Cleanup operations are not being conducted properly
- Offers no value to natural recovery
- Is causing collateral damage
- Slows the recovery process

Chalk Point, MD Spill April 2000

Vertical aerial photograph right after the spill. Note the extensive oil in the wetlands to the left. There was no active removal of oil from these inaccessible areas.

Chalk Point, MD Spill 2001

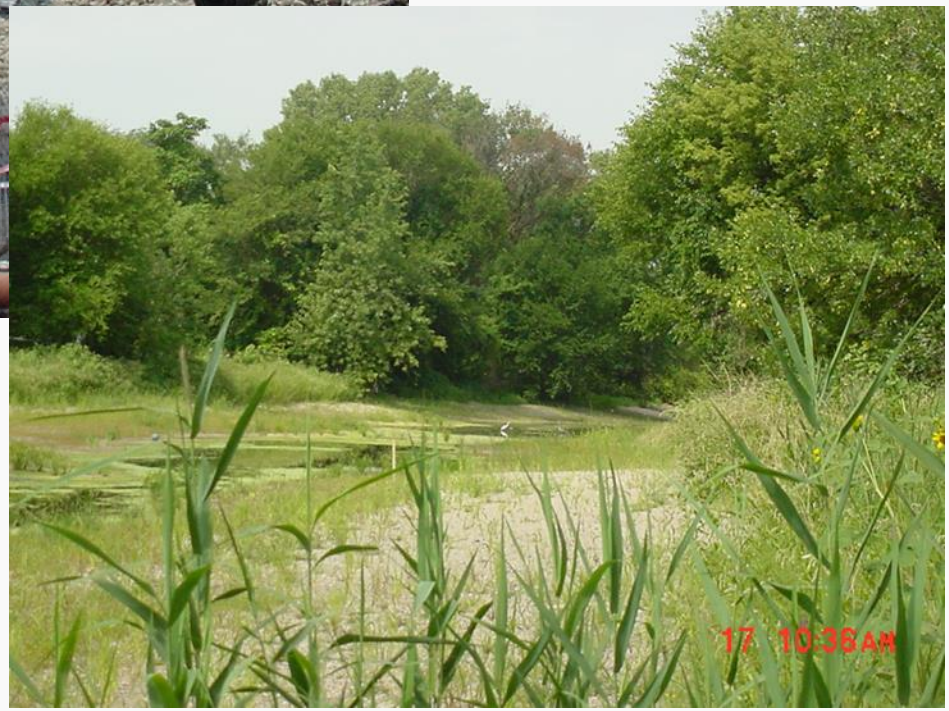


Same area, 1 year after the spill. Note the scars to the right of the access road, where trenching was done to recover the oil.

Chalk Point, MD Spill Fall 2004

Same area, 3 years after the spill. Most of the effects on the vegetation are no longer visible; even the muskrats have returned. The many circular points are muskrat huts.

Grand Calumet, IN
Before and After
Restoration



Unmanned Aircraft System (UAS) Use and Policy

Unmanned Aircraft Systems (aka: UAVs, Drones) are increasingly being used for data collection. It is important to have data management policies in effect before utilizing a UAS to assist in reconnaissance efforts.

Benefits:

- Photo/Video: High resolution, infrared/thermal/FLIR, and multispectral cameras
- Gas Sensors: H2S, SO2, VOCs. Particulates and other air sampling capabilities if fire.
- Remote Sensing: Imaging spectroscopy, LiDAR, 3D models, vegetation analysis.

(UAS) Use and Policy

Limitations:

- Privacy Protections
- Civil Rights and Civil Liberty Protections
- Government Data Accountability/Transparency
- Air Data must be field verified/validated
- IT Security
- Significant Data Management

Approved Methods

SCAT and scientific review helps to establish approved cleanup methods and options:

- Natural Recovery
- Barriers, Booms, Weirs
- Leaf blowers (low throttle)
- Drum Vacs
- Beach Sifters, Tilling
- Vegetative cutting
- Use of surface washing response agents
  (For EPA these must be approved by RRT (National Products Schedule).

<u>Typical examples of “approved methods”</u>

- Remove oily debris
- Flush the creek, (*unstrand the oil – “flush and recover”*)
- Torch Rocks
- Underflow dam construction

SCAT Lessons Learned:

- Activate a SCAT process early
- Create Segments, work done in a manageable way
- Develop a unique identifier numbering scheme
- SCAT Zones = OPS Zones
- Big spill, big SCAT resources
- Manage in electronic formats (e-forms and drop-down menus)
- (off-line data collection capability)

On a large spill there could be hundreds of segments, thousands of zones, and many trained teams.

First few days, expect it to be less organized
– information incomplete or incorrect
– no Incident Action Plan (IAP)

Other Resources (available at https://rrt5.org)

- NOAA Shoreline Assessment Manual
- Habitat fact sheets
- SCAT Job Aids
- Incident Management Handbook (EPA/USCG)

QUESTIONS ???