

w/Lew

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 Subject: Notes from the May 29 NR Restoration Training

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----- Message Contents -----

Greetings! Please review these notes prior to the conference call at 2:00 pm today.

NATURAL RESOURCE RESTORATION TRAINING
 May 29, 1996

Liz Block introduced Dan Audet, field manager for Coeur d'Alene Project (lots of mining and smelting). He has been doing injury assessment for the last several years, and has an oil spill background with the Department of Defense.

We will look at Bunker Hill and then apply it here at Hanford, then apply it to the CRCIA.

Looking for an overlap of the Trustees and the CRCIA. Today will define the Trustee position and take a look at injury determination. The followon meeting with CRCIA will pull out the more general requirements that CRCIA needs. The CRCIA/Trustee type members will filter the Trustee recommendations first before coming to the whole CRCIA.

*** Contact Sheri Krest - 304-725-8461 National Training Center X267 - if interested in USFWS NRDA training scheduled for the Oct/Nov timeframe, geared for state and tribes involved, probably in Phoenix at the BLM training center, and most likely free. ***

Dan's agenda:
 the NRDA process: terminology and assessment techniques
 Trusteeship: determining boundaries and overlap.

There are 3 steps, 2 we will focus on here:
 1) assess injury to natural resources;
 2) restore injured resources.

The main federal regulations that will be dealt with are CERCLA, CWA, CAA.

release (leads to) - injury (leads to) - (damages, settlement and leads to) - restoration

NRDA studies are used to document injury and show a way to restore that resource.

extremely flexible.

Natural Resource SERVICES: recreational, commercial, ecological, passive use, cultural historical.

NRDA was used at Bunker Hill to fill out the process of cleanup. The damage assessment process is also used in other areas to address injuries.

Terminology

Injury: measurable adverse change in quality

Damages: amount of money sought for the injury

Causation: the connection between release and injury

Pathway: the route or medium of transport from hazard to natural resource

Baseline: the condition(s) that would have existed prior to release

(large discussion on the baseline - this would be negotiated and deserves a lot of attention, BUT remember we're here to restore, if a resource is restorable, don't get hung up on the baseline.)

Services: restoration of services is accomplished by restoring injured resources.

Injury Quantification: reduction from the baseline in the quantity and quality of services

(Need to establish a pathway to an injury, and the Trusteeship must be addressed adequately.)

Air Injury: concentrations in excess of air pollution standards or sufficient to cause injury to a natural resource.

Example: vegetation killed downwind. Now need to recondition soil to allow revegetation.

Groundwater Injury: exceed drinking water standard or caused natural resource injury

Surface Injury: exceeds water quality criteria or sufficient to cause natural resource injury

Geologic Injury: soil pH >8.5 or <4.0; water holding capacity decrease; impede soil microbial respiration; toxic response to soil invertebrates; cause phytotoxic response; sufficient to cause natural resource injury. Tip: Identify areas (2-dimensions) we are concerned about. Then determine how deep (3-dimensions).

Terrestrial injury determination and quantification: characterize concentration in soils; characterize vegetation communities; characterize phytotoxicity; compare to baseline; relate to wildlife: habitat surveys, wildlife surveys.

Example: chart on habitat layers in a range from 0 to 5 - control site had 4-5 habitat layers, the impact site 0.

Look for phytotoxic response in the lab, then go see in the field, then look at populations

Biological Injury: death, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (reproduction), physical deformations, exceed action levels for consuming.

Question asked is it important to have field data as opposed to modeling? Key is to establish injury and field data is the legal route.

to establish extent of injury need population data.

Food: collected 6 pounds of invertebrates from baseline and impact area. Mixed with commercial fish food and made into pellets then fed to lab fish. (what's source of funding? various sources, dan's group got doi money and no prp funding.)

Birds: collect dead birds, count them, analyze stomach contents, monitor the waterfowl usage

Eggshell thinning: lost productivity over time can be based on eggshell thinning.

Use existing data wherever possible. Note: there could be chain of custody issues if end up in litigation.

Examples of types of studies related to NRDA: necropsy, etc. (hopefully on Dan's handout)

Dan asked to break Trustees out into resources of most interest. He explained once we prioritize the studies each Trustee wants then the group integrates the needs of all and works the studies together.

Dan listed the resources to keep in mind and then each organization. He asked each Trustee for the top three resource concerns.

Resource:

AIR
GROUNDWATER
SURFACE WATER
GEOLOGIC-Soil, Sediment
BIOLOGIC-Species & Habitat

Agency and main Trustee concerns:

DOI: manage lands, habitat, migratory birds
DOE: groundwater, geologic, surface water
WA: water quality, fisheries, upland habitat (ecosystem function)
OR: water quality, fisheries, air quality, cultural resources, river/aquatic resources, terrestrial resources
UMA: cultural resources, river/aquatic resources, terrestrial resources
NEZ: cultural resources, geologic, fisheries (salmon)
YAK: sustainability of the Yakama

Department of Commerce should be a participant and should coordinate with NOAA.

Tribes see their Trusteeship as inclusive of everything, beyond even the listed resources, but seeing the world (or site) as a whole - holistic view. The regulations were not written for the tribes and taking tribal values into account. An example is the issue of thermal discharge, which is not a regulated hazard, but caused large fish kills in the past. Note: It will be important to establish aquatic population baselines which predate the thermal discharges.

Let's focus on the contaminants of concern and studies that can be done. The idea is to list some methods to study and methods to restore natural resources.

SLIDE: NRDA Studies

Purpose: to document injury to the natural resource from a discharge of oil or hazardous substance

Studies: Identification of affected resource
Identification of injury
Quantification of injury
Identification of pathways

Connection of injury to discharge

Look at an injury that occurs after 1980 or continues to occur.

Larry Gadbois provided some background on two contaminants of concern, chromium (Cr) and strontium-90 (Sr-90), which came from the single-pass reactors. Discharges were to center and side of the river. Discharge points were moved to the center of the river when realized the hot water killed the fish. Strontium-90 also came from the reactors. Sr accumulates in the bones, so to the extent that a species ingests bone determines the impact on the foodchain. Salmon are very sensitive to Cr. Sr-90 has a cancer effect; Cr is acutely and chronically toxic, very corrosive to tissue. There is a factor of 2 dilution from shore to upwelling of groundwater into center of river. Cr was discharged to soil at 700 ppb, plumes are now at the 200-250 ppb.

Dan divided the group into three groups. Each group brainstormed the study methodologies connected with Cr and Sr-90 contaminants. These are two contaminants of concern for the Columbia River and were just used as a focus point and training exercise. Each group ended up listing methods for injury determination and did not delve into pathway studies. The following list:

Injury Determination Studies:

Hazardous Substance	Injury Determination
Chromium	historic aquatic resource organism injury: Comparing gene pool diversities within a species - Cr sensitive Cr concentration in sediment Species Inventory historic fish counts Pasco drinking water records Aerial counts Oral history Action level comparison Salmon smolts/eggs bioassays: water exposure survival, growth, deformities, digout, eggs hatch Salmon adults: avoidance Sloughs: phytotoxicity, sediment, invertebrate community Vadose zone characterization Core sediments behind McNary Dam
Cr/Sr	Sturgeon: age distribution (baseline at snake river)
Sr	Uptake (comparing fish heads from hunters)
Cr	Salmon: release- pathway adult avoidance mortality of eggs/ alevins comparing to baseline egg/alevin injury
Sr	tissue analysis
All	toxics inventory: whatever not accounted for was released Bottom Fish: suckers/lamprey chemical analysis Mussels: chem analysis; feeding study
Strontium	water fowl and heron eggs bird stomach contents hatchability/ survival of eggs necropsy/ diagnostic chicks mollusk shells feeding study/ pathways snails from river to ducks /fish sediment - into bottom feeding fish - birds - injury

Q: does chrome damage the navigation ability so that the salmon never return because they can't navigate? Interesting study for the future!

Recoverability of the resource is a factor to consider. The injury determination and quantification must lead to restoration otherwise why do them?

Tom Woods reminds: listen to what is the current impact and then add to it - things the CRCIA has not thought of to determine the real impact.

June 4, 9am to 12 in the Bechtel building is the agreed to time and place for the CRCIA/Trustee joint meeting.

NRDA MEETING

5/29/96

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