



# ***Disturbed Lands Inventory and Assessment Protocol***

## ***Introduction***

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### ***Background***

A Disturbed Lands Workshop held in November, 1996 identified inventory and assessment protocols as an important need in the National Park Service. In 1998, the Abandoned Mineral Lands program received funding. The following year, an additional funding source was provided through the Natural Resource Protection Program (NRPP) for Disturbed Lands Restoration (DLR). These two programs focus monies directly on disturbed area rehabilitation. In the NPS Strategic Plan, there is a direct focus on restoration in Servicewide Goal Ia1. In addition, the Geologic Resources Division (GRD) has been receiving numerous requests annually from parks for assistance with "inventory and assessment".

Through the work of individual parks in the NPS system, state agencies and federal land management agencies, numerous inventory and assessment protocols exist for roads, mines, dams, and other disturbed areas. It was determined that there was a need to compile and organize the protocols already in existence into a streamlined process that could be used across thematic boundaries. Rather than taking the one-size fits all approach, a determination was made to develop a protocol which would serve as a reference section or starting point.

The National Park Service Geologic Resources Division (GRD) sponsored a workshop to develop inventory and assessment protocols for disturbed lands in the National Park System. The Disturbed

Lands Restoration – Inventory and Assessment Workshop was conducted in January, 2002 in Lakewood, Colorado. The workshop brought together a multi-disciplinary team to develop protocols or standards for disturbed land inventory and assessment to assist park staffs nationwide. The target attendees of the workshop were resource managers, scientists and project managers with experience in disturbed land restoration inventory, monitoring and plan development.

### ***Purpose***

This assessment protocol provides a basic level of evaluation for disturbed areas. It can be applied successfully by staff with little scientific training. It is intended to be conducted as a basic inventory and to identify lands which may need further analysis. This protocol consists of a three phase hierarchy of assessment. Level One is the basic core needs, Level Two is Inventory and Assessment Field Data for individual sites, and Phase Three is an intensive assessment for evaluating sites for restoration.

This protocol provides an assessment based primarily on physical conditions within disturbed areas. It may not detect some resource problems caused by factors located beyond the area being assessed. The use of Level Three assessment methods is required to more fully assess site conditions. However, the Level Two assessment is intended to provide a basic inventory to identify areas that need further analysis, and this protocol is well suited to supporting that objective.

## Overview of the Inventory and Assessment Process

Inventory and analysis of characteristics are needed to support interpretations of disturbed land conditions and to define the limits of management influence over the physical system. Because disturbed lands vary tremendously, flexibility is needed to select the characteristics that are most relevant for the area that is being considered. The inventory procedure outlined in this document is intended to provide the needed flexibility. The focus is on an inventory process rather than on a prescribed or fixed set of factors. This approach allows analysts to use existing tools and to adapt the process based on available information, conditions and needs. The inventory and assessment process follows a logical sequence that will provide the basis for supporting professional estimates and judgments resulting in credible conclusions. The products of one level provide information for subsequent levels.

## Natural vs. Human Caused Disturbances

A human caused disturbance is a discrete event that caused a change in the existing condition, structure or function of an ecological system. The term natural is difficult to quantify. Natural, in the context of restoration, implies native species, structures, and processes. This is in contrast to exotic species, structures, and processes. The concept is sometimes best explained from the perspective of defining what is unnatural. Thus, a natural ecosystem would be composed of indigenous (native) species sustained by natural recruitment as opposed to managed reproduction and disturbances functioning within a range of variability. An unnatural ecosystem would have a high percentage of non-native species and disturbance regimes outside those present before ecosystem degradation.

## Decision Flow Chart for the Inventory and Assessment Process

The first step in evaluating a site is to make decisions in regards to the disturbance as either natural or human caused. If the site is determined to be of natural origin, document and monitor the site to determine if it falls within a natural range of variability. If the site is found to have been accelerated by human caused activity, it should be evaluated as if it was a human caused disturbance. The decision flow chart process might indicate that an inventory is needed. If this is the case, follow the three level inventory process. The decision flow chart is shown in figure 1.

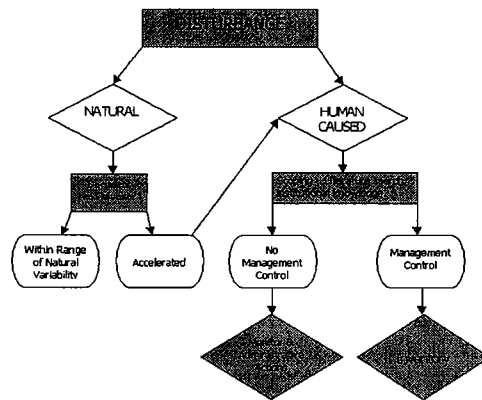


Figure 1. Disturbed Lands Inventory and Assessment Decision Flow Chart

## The Three Levels

*Level One* - The purposes for the Level I Assessment are to provide a reconnaissance level or a core set of data:

- Site Name & ID Number
- Site Feature
- Location
- Type
- Size

*Level Two* - The purposes of the Level II Assessment are to:

- Provide a starting point for identifying potential problems and risks to natural conditions and processes that have been directly impacted by development and or agricultural practices.

- Be a streamlined process designed to identify known and suspected disturbed land sites.
- Provide basic analytical questions for determining potential hazards and environmental risks at a site.
- Provide enough information so that a determination can be made about the need for further analysis (Level III Assessment) of a site.

*Level Three* - The purposes of the Level III Assessment are to:

- Perform a detailed science-based analysis of a disturbed area.
- Assess the benefits, problems, and risks of the site.
- Identify management options for a disturbed area.
- Be the basis from which compliance requirements can be met.

### ***Using this protocol***

For this protocol, the disturbed area or site is defined as park lands where the natural conditions and processes have been directly impacted by development and/or by agricultural practices. If conditions change dramatically within a disturbed area, identify additional assessment areas and conduct separate assessments for each. The assessment can be recorded on a worksheet as shown in figure 2 or it can be placed into a GPS data dictionary. The assessment protocol worksheet consists of two principal levels. The identification section or core data needs records basic information about the site, such as name & ID number, location, type of site and size. Space is provided for a diagram of the site, which may be useful to illustrate problem areas.

The assessment section is used to record the scores for the various elements. Not all assessment elements will be applicable or useful for your site. Do not score elements that are not applicable. Score an element by comparing your observations to the descriptions provided. The overall assessment score is determined by adding the values for each element and dividing by the number of elements assessed. For

example, if your scores add up to # and you used # assessment elements, you would have an overall assessment value of #, which is classified as *fair*. This value provides a numerical assessment of the environmental condition of the site. This value can be used as a general statement about the "state of the site or (over time) as an indicator of trends in condition.

## Disturbed Land Inventory and Assessment Worksheet

### Level I - Core set of data/Reconnaissance:

Site Name & ID Number \_\_\_\_\_  
 Location \_\_\_\_\_  
 Type \_\_\_\_\_  
 Size (acres) \_\_\_\_\_  
 Geographic Location (UTM, Lat/Long) \_\_\_\_\_  
 Public Land Survey System (Section, Township, Range) \_\_\_\_\_  
 Park Management Area (If applicable) \_\_\_\_\_

### Level II - Assessment:

**Administrative Use:** (parking area, trailhead, fire suppression, etc.)      Yes    No

**Rills?**            Yes: (slope= <5%    5-20%    >20%)            No

**Gullies?**        Yes: (depth= <1'    1-5'    >5')            No

**Slope Stability?** (creep, slump, subsidence, etc.)    Yes    No

#### Soils

<i>Depth?</i>	<1"	1-6"	6-18"	>18"		
<i>Texture?</i>	Clay	Silt	Sand	Course grained		
<i>Color?</i>	Dark	Medium	Light	Other		
<i>Staining or Evidence of contamination?</i>					Yes	No
<i>Biological Soil Crust?</i>		Yes: (% cover_____)			No	
<i>Compaction?</i>					Yes	No

<b>Vegetation</b> (on Disturbed Area)	Healthy	Struggling	None
<i>Noxious Weeds?</i> (% cover)	None	<50%	>50%

#### Hydrology

<i>Does disturbance disrupt surface water flow?</i>	Yes	No
<i>Disrupt a small channel?</i>	Yes	No
<i>Diverting, concentrating, or impeding surface flow?</i>	Yes	No
<i>Disrupt or intercept stream or wash?</i>	Yes	No
<i>Is there evidence of:</i>		
<i>Springs?</i>	Yes	No
<i>Seeps?</i>	Yes	No
<i>Wet Ponding/standing water?</i>	Yes	No
<i>Wetland Plants?</i>	Yes	No
<i>Bathtub Rings?</i>	Yes	No

#### Wildlife

<i>Wildlife use?</i>	Yes	No
<i>Exotic animal use?</i>	Yes	No

<i>T&amp;E habitat?</i>	Yes	No
<i>Wildlife attractants (food, garbage, ect...)</i>	Yes	No
<i>Residual/non-resident (migratory)?</i>	Yes	No
<i>Breeding or nesting site?</i>	Yes	No

**Cultural**

<i>Presence of Historic, prehistoric structures?</i>	Yes	No
<i>Presence of paleontological features/artifacts?</i>	Yes	No

**Visitor Experience**

<i>Visible from roads, trails, overlooks?</i>	Yes	No	
<i>Visitor use?</i>	Yes	No	
<i>Level of Use:</i>	High	Medium	Low
<i>Blends with surrounding environment?</i>	Blends	Noticable	Obvious

**Safety Hazards**

<i>Evidence of contamination?</i>	Yes	No
<i>Structures?</i>	Yes	No
<i>Stable?</i>	Yes	No
<i>Secured?</i>	Yes	No
<i>Unstable Slopes?</i>	Yes	No
<i>Highwalls?</i>	Yes	No
<i>Explosives or Chemicals?</i>	Yes	No
<i>Equipment left on-site?</i>	Yes	No
<i>Wells or openings?</i>	Yes	No
<i>Secured?</i>	Yes	No

**Notes/Recommendations:**

**Sketch Map:**