Levee Vegetation Matrix

Seattle District
US Army Corps of Engineers

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BUILDING STRONG®

Matrix Overview

PURPOSE, to provide a tool that:

- Maintains levee integrity while minimizing impacts to, or enables enhancement of, natural resources
- Assists levee sponsors in assessing the levee condition.

Intended Results:

- Assessment that assists sponsors with prioritizing levee maintenance and improvement needs.
- Meet levee vegetation maintenance mitigation requirements

Matrix Overview

Process:

- Gather information about your levee(s)
- Identify levee reaches within each levee system
- Evaluate ‘threat levels’ for levee conditions and attributes
- Determine vegetation types and sizes

Levee Attributes

Integrity Attributes:

- Conveyance
- Seepage
- Stability
- Erosion

Operational Attributes:

- Access (flood response)
- Inspection

Levee Vegetation Ecological Attributes

1. Continuous, complex dense roots/stems (for in-water habitat structure)
2. Shade (tall trees, percent canopy coverage on water per site opportunities or limitations)
3. Plant species diversity
4. Multi-layered canopy
5. Horizontal growth pattern/overhead cover

Threat Levels

Levels define the hazard associated with each levee attribute.

- Level 1: High
- Level 2: Medium
- Level 3: Low

Levels are based on:

- History of levee performance
- Current condition of levee
- River/flood characteristics

Seepage (Example)

Level 1 based on:

- History of levee performance:
  - Levee reach has a history of seepage problems
  - Flood response measures were performed to control seepage
- Current condition of levee:
  - Levee is not overbuilt.
  - Significant head potential (tall levee)
  - No cutoff wall or other structure in place to reduce seepage
  - Foundation/embankment material susceptible to seepage
- River/flood characteristics
  - Long duration flooding typical
  - High velocity

Matrix Walk Through

- Define levee reach
- Select threat level for each attribute
- Determine vegetation for each levee sub-section
- Use Matrix to assess condition of the levee

Define Reach

- Levee Sponsor determines number of reaches within levee system
- Maximum reach size is a levee system
- Generally a reach would have similar attribute characteristics and geometry
- If a reach has varying attribute characteristics, the most critical will govern the level selected

Select Attribute Levels

Selected Levels are highlighted in yellow

LEVEE INTEGRITY ATTRIBUTES	
ROW 1 CONVEYANCE	YES
	NO
ROW 2 SEEPAGE	LEVEL 1
	LEVEL 2
	LEVEL 3
ROW 3 EROSION	LEVEL 1
	LEVEL 2
	LEVEL 3
ROW 4 STABILITY (On Landside of Levee and Levee Top)	LEVEL 1
	LEVEL 2
	LEVEL 3
ROW 5 STABILITY (On Riverside of Levee)	LEVEL 1
	LEVEL 2
	LEVEL 3
LEVEE OPERATIONAL ATTRIBUTES AND	**THREAT LEVELS**
ROW 6 ACCESS	LEVEL 1
	LEVEL 2
	LEVEL 3
ROW 7 INSPECTION	No 'Levels' needed here
VEGETATION MGMT OBJECTIVES	
VEGETATION (Objectives listed in order of preference for each part of levee cross section A thru F: 1 = Highest Pref, 5 = Lowest Pref)	1
	2
	3
	4
	5

Questions?