

2011 Bear River Survey Parameter Descriptions

During the summer of 2011, the Tip of the Mitt Watershed Council and Little Traverse Bay Bands of Odawa Indians conducted a survey of riverfront properties on the Bear River that was funded by the Great Lakes Restoration Initiative. Every property along the Bear River was surveyed to document streambank erosion, greenbelt health, and the presence of invasive species. An overall erosion severity rating of “severe”, “moderate”, or “minor” was determined for each site, and each property received a greenbelt rating of “excellent,” “good,” or “poor.” Invasive species observed during the survey were noted for individual properties.

The following are descriptions for the column headings in the Bear River Survey Database, which is attached to the end of this document:

Greenbelts: A greenbelt, in the context of river management, is the vegetated area along the riverfront. A healthy greenbelt consists of a structural mix of native trees, shrubs, and herbaceous plants, which provides many benefits to the river ecosystem including bank stabilization and erosion control, habitat for plants and wildlife, infiltration of runoff, and filtration of pollutants such as sediments and nutrients.

Greenbelts for riverfront properties were rated based on the amount of intact streambank vegetation. Properties with at least 75% of their riparian vegetation intact received an “excellent” rating. Properties missing between ~50%-75% of their streambank vegetation received a “moderate” rating and properties with more than 50% of the greenbelt missing were assigned a “poor” rating. Greenbelt ratings were determined using information from GPS camera photos, as well as field survey notes taken by the LTBB Project Coordinator and TOMWC staff.

Erosion: Erosion is the process by which soil is worn away by wind, water, waves, etc. Erosion is exacerbated when vegetation along riverbanks and shorelines is removed because the roots of those plants are important for holding soil together. Erosion potential varies depending on the site and conditions, but generally speaking, bare soil has the most potential for eroding, especially on steep slopes. Turf grass provides a little better protection than bare soil, but the roots of turf grass are very minimal when compared to more deeply-rooted native herbaceous plants, shrubs, and trees.

Erosion was noted based on river banks that exhibited any of the following: areas of bare soil, leaning or downed trees, exposed tree roots, undercut banks, slumping hunks of sod, excessive deposits of sediments, or muddy water. Shoreline erosion was recorded on field data sheets with estimates of its extent and relative severity (“minor,” “moderate,” “severe”). For example

“Mx20” indicates 20 feet of shoreline with moderate erosion. Additional information about the nature of the erosion, such as location and potential causes, was also noted.

Specific parameters that were used to determine erosion severity include: bank condition, erosion trend, and bank slope. Sites rated as severe generally had erosion occurring at both the toe and upper bank, a trend of increasing erosion, and steep bank slopes (one foot of vertical drop for every foot of horizontal distance or greater). Those rated as minor generally had erosion occurring in only one location (either the toe or the upper bank), a trend of stable or decreasing erosion, and gradual bank slopes. Moderate erosion sites had a mix of severe versus minor characteristics. Field notes and photographs were used extensively to determine and adjust ratings.

Invasive species: Invasive species are non-indigenous species that create an ecosystem disruption or causes harm to the environment when introduced, which varies in terms of the type of disruption or harm caused and the severity. The introduction of an invasive species can lead to localized loss of native species, alter fundamental ecosystem processes (e.g. nutrient cycle disruptions caused by zebra mussels), and even cause hydrological changes.

Invasive species were recorded as observed during the survey for individual properties along the Bear River. Although many different invasive species were noted during the survey, outreach and control efforts associated with this project focused on only those listed as “harmful invasive species” in the Bear River Watershed Invasive Species Management Plan (black swallowwort, Japanese knotweed, giant knotweed, invasive *Phragmites australis*, invasive buckthorn, and purple loosestrife). The harmful invasive species noted in the field were included in the GIS layer developed to present survey findings.

Random ID#	Erosion Description	Erosion Severity	Greenbelt Rating	Invasive species found on property	Other invasives found on property
1	70', toe undercutting, decreasing to increasing	moderate	Excellent		
2	None	none	Good	Purple loosestrife	
3	60', toe undercutting, decreasing to stable	minor	Excellent		
4	None	none	Excellent	Purple loosestrife	
5	110', toe undercutting, stable	minor	Excellent		
6	None	none	Excellent		
7	None	none	Excellent		
8	None	none	Excellent		
9	750', toe and upper bank eroding, stable to increasing	severe	Excellent	Black swallowwort	Japanese knotweed
10	None	none	Excellent		
11	None	none	Excellent	Purple loosestrife	
12	25', no other data	minor	Excellent		
13	None	none	Excellent	Purple loosestrife	
14	None	none	Excellent		
15	None	none	Poor		
16	None	none	Excellent		
17	None	none	Excellent	Purple loosestrife	
18	None	none	Excellent		
19	60', toe and upper bank eroding, stable	moderate	Excellent		
20	None	none	Excellent		
21	None	none	Excellent		
22	None	none	Excellent		
23	None	none	Excellent		
24	None	none	Excellent	Purple loosestrife	
25	None	none	Excellent	Purple loosestrife	
26	None	none	Excellent	Purple loosestrife	
27	None	none	Excellent		
28	None	none	Excellent	Purple loosestrife	
29	330', toe and upper bank eroding, decreasing to increasing	severe	Excellent		
30	None	none	Excellent		
31	None	none	Excellent	Purple loosestrife	
32	None	none	Excellent	Purple loosestrife	
33	113', toe undercutting, decreasing to increasing	moderate	Excellent		

Random ID#	Erosion Description	Erosion Severity	Greenbelt Rating	Invasive species found on property	Other invasives found on property
34	None	none	Excellent	Purple loosestrife	
35	None	none	Good	Purple loosestrife	
36	40', toe undercutting, stable	minor	Excellent	Invasive Phragmites	
37	40', toe and upper bank eroding, stable to increasing	moderate	Excellent		
38	None	none	Excellent		
39	None	none	no data		
40	None	none	Excellent		
41	40', toe stable and upper bank eroding, stable	minor	Excellent		
42	None	none	Excellent		
43	None	none	Excellent		
44	None	none	Good		
45	None	none	Excellent		
46	None	none	Excellent		
47	None	none	Excellent		
48	80', toe undercutting, stable	minor	Excellent		
49	None	none	Excellent		
50	None	none	Poor		
51	175', toe undercutting, decreasing to increasing	moderate	Excellent		
52	None	none	Excellent		
53	None	none	Excellent		
54	100', toe undercutting, decreasing to stable	minor	Excellent		
55	None	none	Excellent		
56	None	none	Excellent		
57	80', toe undercutting, decreasing	minor	Excellent		
58	None	none	Excellent		
59	None	none	no data		
60	100', toe undercutting, decreasing	minor	Excellent		
61	None	none	Excellent		
62	None	none	Excellent		
63	None	none	Excellent		
64	100', toe undercutting, stable	minor	Excellent		
65	None	none	Good		
66	None	none	Excellent		

Random ID#	Erosion Description	Erosion Severity	Greenbelt Rating	Invasive species found on property	Other invasives found on property
67	30', toe and upper bank eroding, decreasing to increasing	minor	Excellent		
68	None	none	Excellent		
69	None	none	Excellent		
70	None	none	Excellent		
71	300', toe undercutting, decreasing to increasing	moderate	Excellent		
72	None	none	Excellent		
73	None	none	Excellent		
74	None	none	Excellent		
75	None	none	Excellent	Purple loosestrife	
76	None	none	Excellent		
77	None	none	Poor		
78	None	none	Excellent		
79	190', toe undercutting, decreasing to stable	minor	Excellent		
80	None	none	Excellent		
81	None	none	Excellent		
82	25', toe undercutting, decreasing to stable	minor	Excellent	Invasive Buckthorn	
83	300', toe and upper bank eroding, decreasing to increasing	severe	Excellent		
84	None	none	Excellent		
85	None	none	Excellent		
86	None	none	Good	Japanese knotweed	
87	None	none	Excellent	Purple loosestrife	
88	None	none	Excellent		
89	None	none	Excellent		
90	None	none	Excellent		
91	None	none	Excellent	Purple loosestrife	
92	None	none	Excellent		
93	None	none	Excellent		
94	None	none	Excellent		
95	None	none	Excellent		