

OWEB Coastal Storm Assessment Project

Prepared by

**The Institute for Natural Resources
Oregon State University**

**Marine Resource Management Program and
Oregon Sea Grant
Oregon State University**

for the

Oregon Watershed Enhancement Board



Goal of Coastal Storms Project

Provide a science-based approach to assist OWEB in determining if its restoration project guidelines are robust enough to take into account potential increases in storm magnitude, frequency and/or intensity associated with climate change.

Approach

Assessment of the 2007 storm characteristics and intensity

Random selection of OWEB funded restoration activities

On-site storm damage assessment:

- Wind throw
- Debris & torrent flow

On-site condition and effectiveness

- Pre-storm from OWEB monitoring reports
- Post-storm using rapid field assessment methodology

Independent expert judgment used to:

- Create assessment protocols
- Validate field assessments for each site

Taylor Scale of Storm Intensity

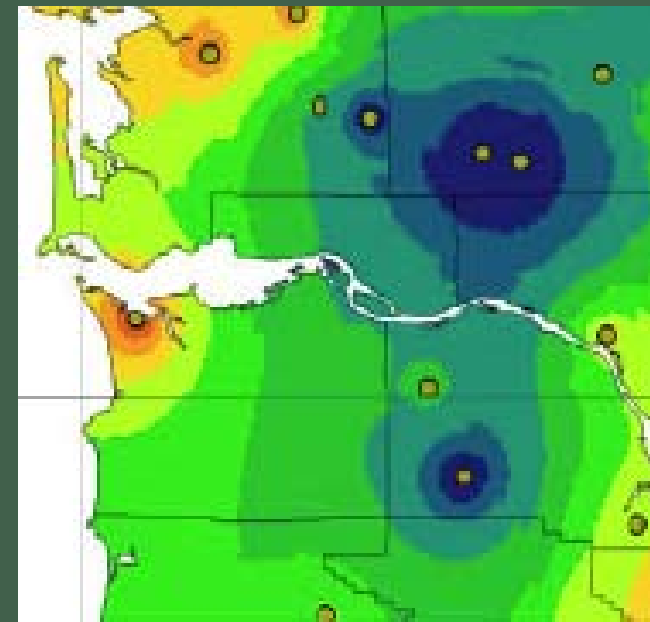
Table 1. Storm Intensity scale using five categories

Parameter	Units	Likert Scale*				
		1	2	3	4	5
Precipitable Water, Salem	mm	20	22	24	26	28
Precipitation, Percent of 100 year, maximum observed	percent	100	110	120	130	140
Maximum wind gust, Oregon-Washington Coast, sea level	mph	80+	90+	100+	110+	120+

* A value of 1 represents the smallest or weakest significant storm, 5 the highest. The parameters are mutually exclusive.



Wind



Precipitation

Selection of Sample Sites

33 OWEB Grant Numbers in study area

Random selection of 19 grant numbers/86 individual projects/sites:

- 60 riparian planting
- 13 large wood placement
- 13 fish passage

Rapid Field Assessment

Develop a rapid assessment framework with individual protocols developed for each of the restoration activities:

- Be able to be completed quickly and accurately in the field without the use of specialized equipment or time consuming detailed measurement
- Establish baseline measures of the condition and effectiveness of the restoration projects
- Identify potential recent wind, torrent and debris damage to the projects.

Can be used for day to day OWEB monitoring needs

Site Condition

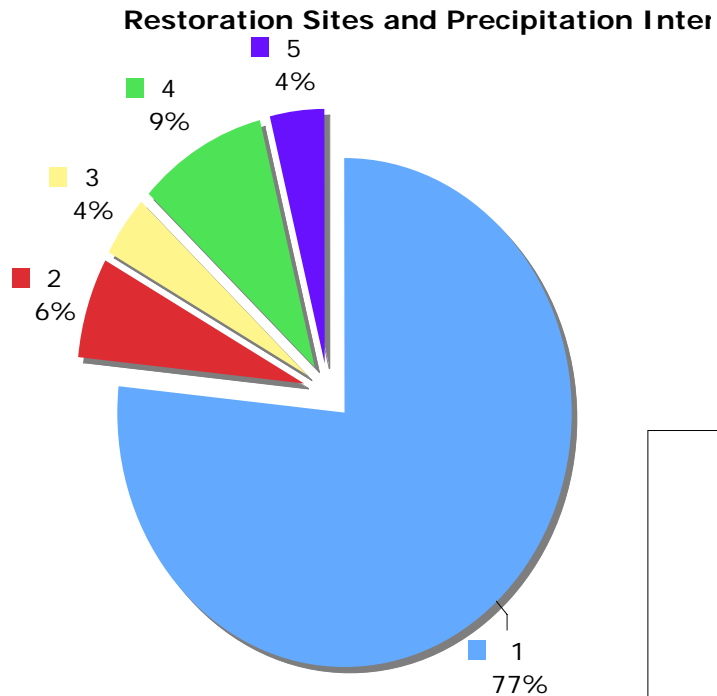
Table 7. Field assessment of restoration site condition

	Condition				
	1 (=worse)	2	3	4	5 (=better)
All Projects	1%	3%	14%	50%	31%
Riparian	0%	2%	15%	57%	27%
Large Wood Placement	8%	15%	0%	23%	54%
Fish Passage	0%	0%	23%	46%	31%

A value of 1 indicates that there was no evidence of restoration activity at the site.

A score of 5 would indicate that site/project in the best physical condition possible given normally prevailing conditions.

Change in Site Condition

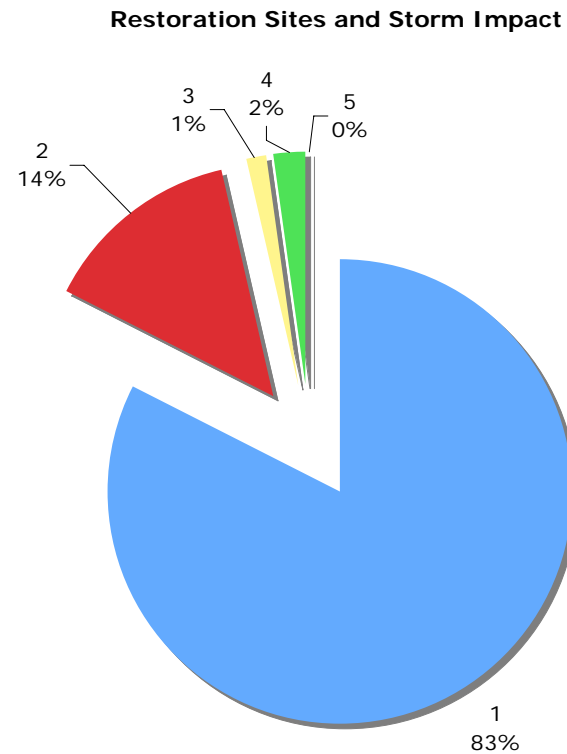


1 = 100% of 100 year maximum

5 = 140% of 100 year maximum

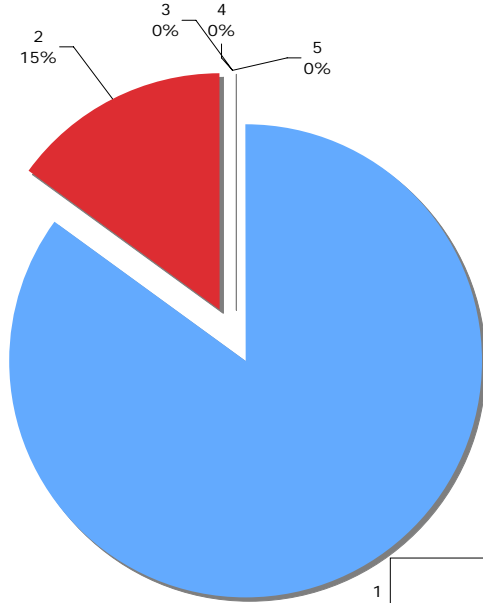
1 = No adverse change

5 = Severe adverse change

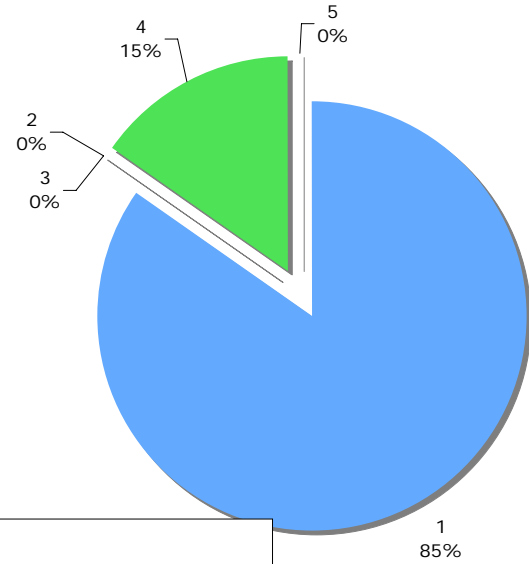


Change in Site Condition

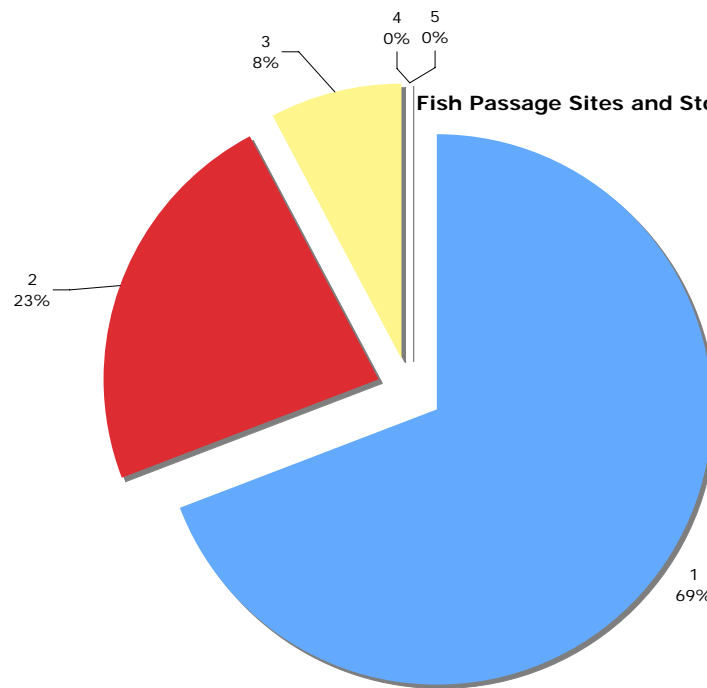
Riparian Sites and Storm Impact



LWP Sites and Storm Impact



Fish Passage Sites and Storm Impact



1 = No adverse change

5 = Severe adverse change

Findings

The Dec 07 storm had a minor impact on OWEB funded restoration projects on the North Coast:

- Prevailing winter conditions on the North Coast tend to towards the extreme and frequently impact restoration sites
- Less resilient sites are likely not subject to restoration and if they are they either do not last or they receive “best practice” treatment
- Restoration design, implementation and rehabilitation practices limit lasting effects from severe storms

Damage from elk and beaver, smothering by invasive species and landowner neglect also impact restoration sites

Caveats

Riparian plantings at the sampled sites were relatively young and plantings may suffer more significant storm damage as they mature

Our findings should not be extrapolated to the rest of Oregon, especially east of the coast range. Different land uses, climate and hydrological regimes may mean restoration sites are impacted differently by severe storms

The absence of systematic pre-storm monitoring data made before and after comparisons of site condition and effectiveness impossible in all but a few instances

Some observed storm damage used to infer impact could have occurred in storms prior to December 2007

Recommendations

OWEB should:

1. Develop a web-based one-stop shop for best practice guidelines for all restoration activities promoting:
 - Greater consistency in the effectiveness of projects overtime
 - An accessible body of knowledge for the next generation of restoration practitioners
2. Require greater consistency in monitoring reporting from restoration practitioners. Our rapid assessment approach is easy to follow and requires no special training or equipment, yet provides consistent monitoring of project condition and effectiveness across a region and through time.

Recommendations

3. Support research that helps reduce uncertainty about the effects of climate change on Oregon's watersheds including the development of regionally downscaled models that forecast climate under a range of scenarios at a watershed scale
4. Build climate change detection into its monitoring protocols to help identify long-term cumulative changes in watershed condition
5. Consider the need to demonstrate climate resiliency and/or ongoing climate adaptation in restoration practices as a condition for funding

Thanks

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