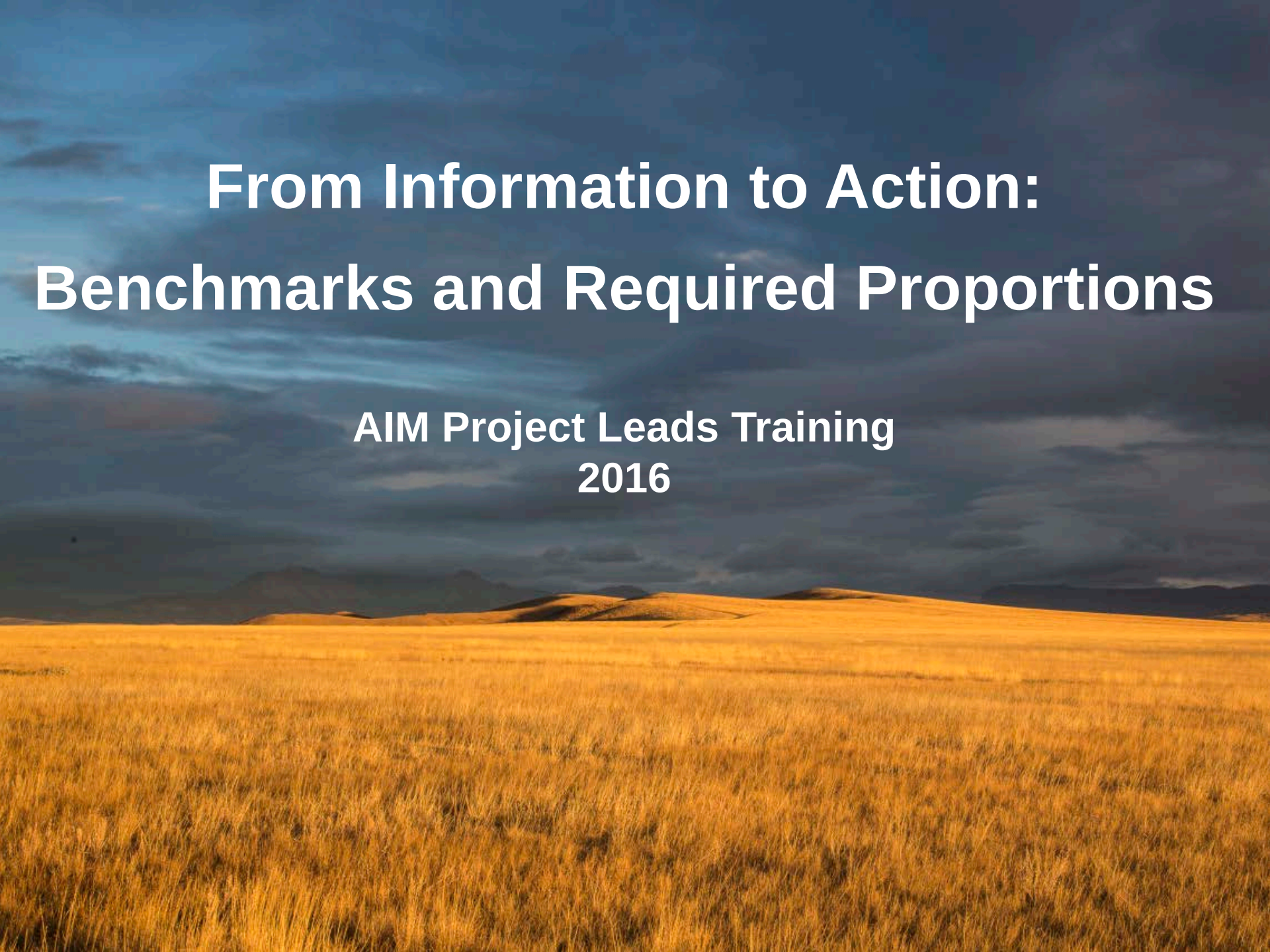


From Information to Action: Benchmarks and Required Proportions

**AIM Project Leads Training
2016**



Why benchmarks?



Way to objectively operationalize policy statements such as: “*take appropriate action*” to make “*significant progress toward fulfillment*” of land health standards (43 CFR 4180)

Benchmarks defined

- Indicator values, or ranges of values, that:
 - o Indicate project success
 - o Trigger reevaluation
 - o Trigger when action is necessary to adjust management practices
 - o Trigger mitigation actions



Required proportions defined

- Proportion of the landscape that should meet benchmark conditions



Example: Terrestrial

Management objective: Maintain seasonal habitats for greater sage-grouse

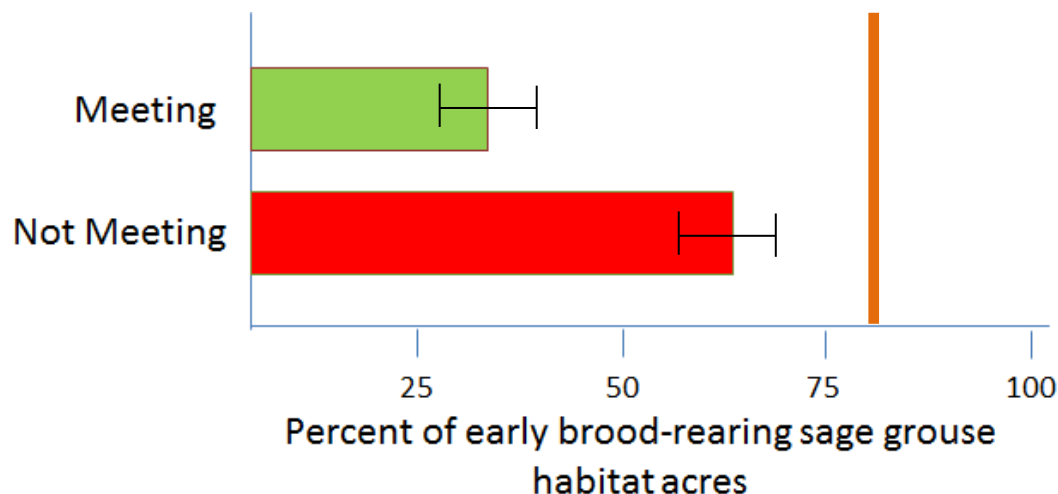
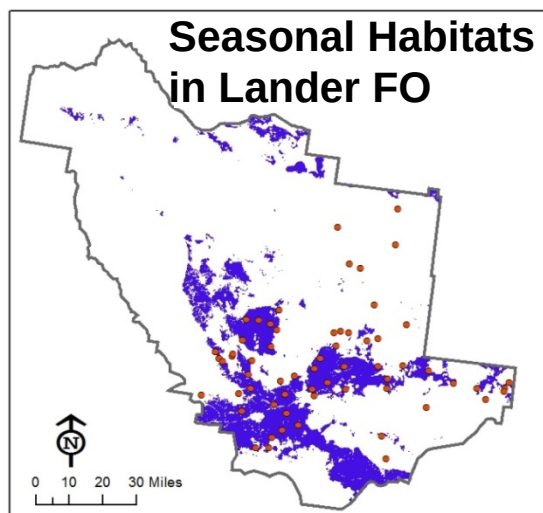
Monitoring objective: For nesting and early brood-rearing sage-grouse habitats, maintain sagebrush cover greater than 15% and less than 25% across 80% of the habitat area.

- Benchmark: sagebrush cover $\geq 15\%$ and $\leq 25\%$
- Required proportion: 80% of habitat area



Example: Terrestrial

Monitoring objective: For nesting and early brood-rearing sage-grouse habitats, maintain sagebrush cover greater than 15% and less than 25% across 80% of the habitat area.



Objective: Not Achieved

Example: Aquatic

Management objective: maintain stream channel form and function within natural ranges of local physiographic conditions

Monitoring objective: Determine whether bank stability is greater than or equal to 75% for 80% of perennial wadeable streams in the planning area with 95% confidence.

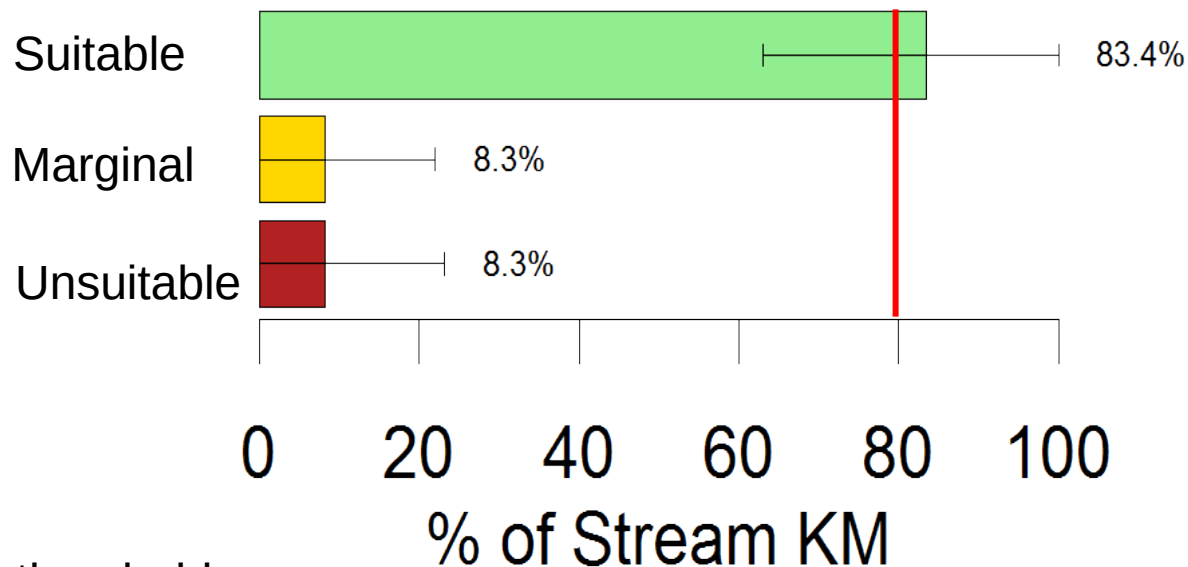
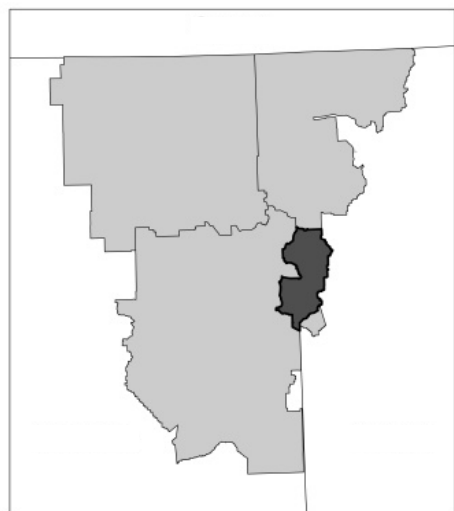
- Benchmark: average bank stability $\geq 75\%$
- Required Proportion: 80% of stream km



Example: Aquatic

Monitoring objective: Determine whether bank stability is greater than or equal to 75% for 80% of perennial wadeable streams in the planning area with 90% confidence.

Twin Peaks Allotment



Bank stability condition thresholds

Suitable: > 85%

Marginal: 85 – 75

Unsuitable: < 75%

Objective: Achieved



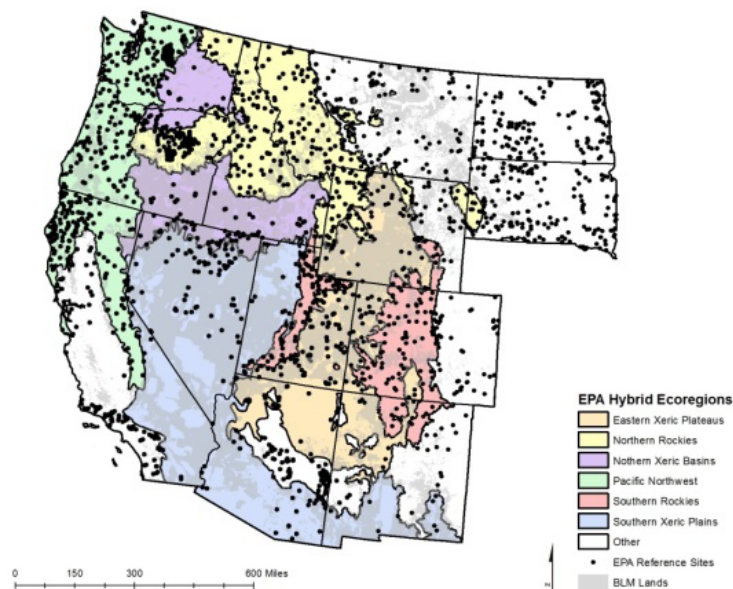
Setting benchmarks

Approaches

- ‘*Least disturbed*’ or ‘*reference*’ conditions
- Desired conditions
- Relative to potential

Information sources

- Best professional judgment
- Paired reference site
- Ecological site descriptions
- Range of variability among reference site networks
- Predicted natural conditions
- Peer-reviewed studies



Setting benchmarks

Sage-grouse habitat assessment (peer-reviewed studies) - HAF

Table 17. Summer/late brood-rearing habitat life requisites, indicators, and suitability categories for upland sagebrush site-scale habitat descriptions (adapted from Connelly et al. 2000; Sather-Blair et al. 2000; Hagen et al. 2007).

Life Requisite Feature	Habitat Indicator	Suitability Categories		
		Suitable	Marginal	Unsuitable
Cover	Sagebrush Cover (%)	10 to 25	5 to <10 or >25	<5
	Sagebrush Height (cm)	40 to 80	20 to <40 or >80	<20
Cover and Food	Perennial Grass and Forb Cover (%)	≥15	5 to <15	<5
Food	Preferred Forb Availability ¹	Preferred forbs are common with appropriate numbers of species present	Preferred forbs are common but only a few preferred species are present	Preferred forbs are rare

¹ Good abundance, diversity, and availability relative to ecological site potential.



Setting benchmarks

Reclamation treatment effectiveness (reference site network)

Reclamation Site

Criteria Indicators	Values
Foliar Cover	37%
Bare Ground	27%
Shrub/Forb density (stems/acre)	5,370



All *similar* PJ Reference Sites

Criteria Indicators	Values
Foliar Cover (n=27)	51% $\pm$ 3
Bare Ground (n=27)	15% $\pm$ 1
Shrub/Forb density (stems/acre) (n=6)	4,795 $\pm$ 1,292



Setting benchmarks

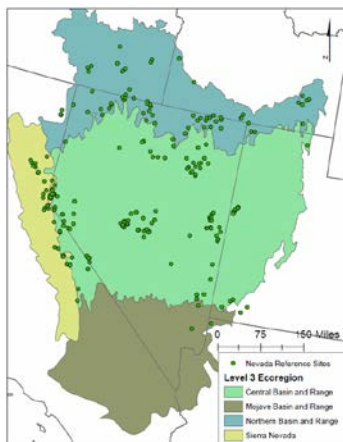
LUP Watershed Assessment (Peer-reviewed literature / best professional judgment - NMFS)

Pathway	Metric		High Condition	Moderate Condition	Low Condition
Habitat Elements	Spawning Gravel		Surficial fine sediment (< 0.06 mm) is less than 5%.	Surficial fine sediment (< 0.06 mm) is 5-10%.	Surficial fine sediment (< 0.06 mm) is greater than 10%.
	Large Woody Debris (LWD)		Near-natural levels of acting and potential large wood debris	Acting levels of large wood debris are near-natural, potential levels are below near-natural, or vice versa.	Both acting and potential levels of large wood debris are below near-natural levels.
	Pool Frequency		Meets pool frequency occurrence	Meets pool frequency standards but large woody debris recruitment or other pool-creating factors are inadequate to maintain pools over time.	Does not meet pool frequency standards.
	Channel Width (ft)	# pools/mile			
	<=5	184			
	>5<=10	96			
	>10<=15	70			
	<15>=20	56			
	<20>=25	47			
	<25>=50	26			
	<50>=75	23			
	>75	18			
	Pool Quality (based on 2008 BLM MIM ^a methodology or equivalent)		Pool quality rating >80	Pool quality rating 60-80	Pool quality rating <60
	Refugium		Adequate habitat refugia exist within watershed (number, size, condition, species requirements, and connectivity).	Limited habitat refugia exist within watershed (number, size, condition, species requirements, and connectivity).	Inadequate habitat refugia exist within watershed (number, size, condition, species requirements, and connectivity).
	Percent Surface Fines (< 6 mm)		A and B Rosgen Channel Types (RCTs) <=10% C and E RCTs <= 20%	A and B RCTs = 11-20% C and E CT's = 21-30%	A and B RCTs > = 21% C and E RCTs > = 31%

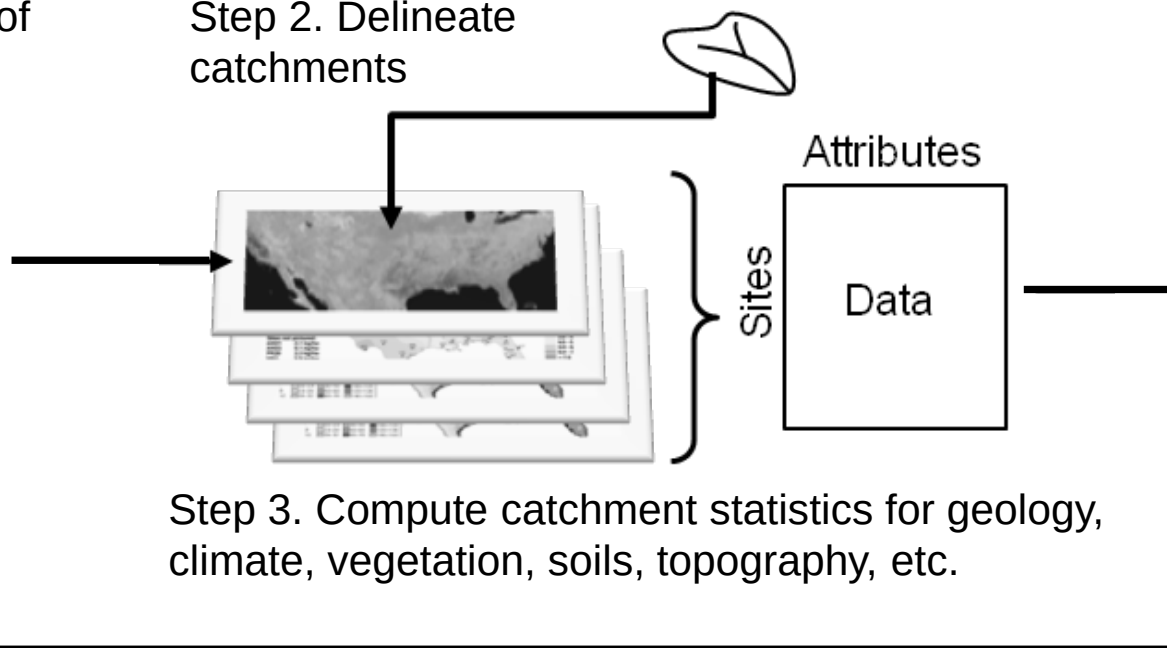
Setting benchmarks

Predicted natural conditions – streams and rivers

Step 1. Sample network of reference sites

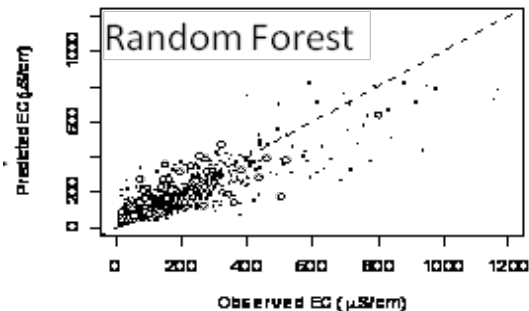


Step 2. Delineate catchments



Step 3. Compute catchment statistics for geology, climate, vegetation, soils, topography, etc.

Step 4. Build reference site models



Step 5. Compare observed values at test sites to those predicted to occur

Setting benchmarks

Aquatic macroinvertebrates (Predicted natural conditions)

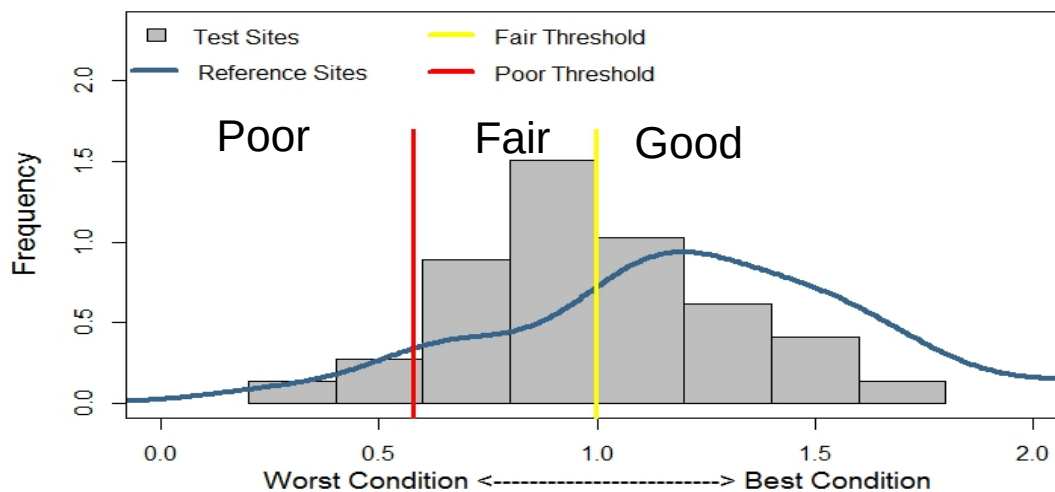
Predicted



Observed



O/E
Score
0.38



Applications and benefits of benchmarks

- Facilitates objective assessment of Land Health Standards, Land Use Plan effectiveness, restoration objectives or other management objectives
- Allows comparisons across areas with different potential – common currency
- Identifies critical information gaps



Document Objectives and Benchmarks

AIM Monitoring Design Worksheet

- <http://aim.landscapetoolbox.org/design/>
- <http://aim.landscapetoolbox.org/benchmarks/>





Thanks!