

OBSERVER TRENDS IN THE “PREPONDERANCE OF EVIDENCE” APPROACH TO INTERPRETING INDICATORS OF RANGELAND HEALTH



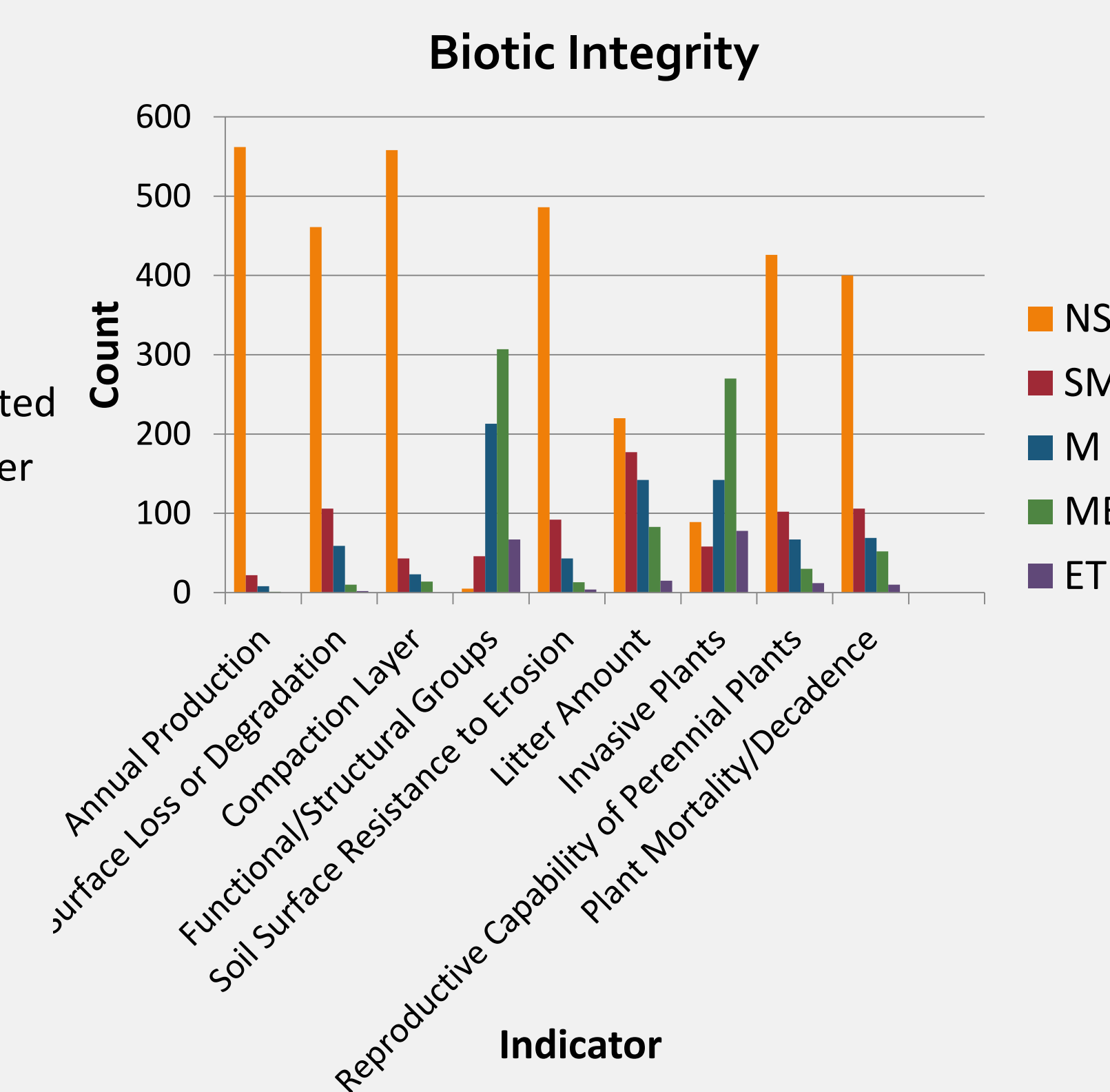
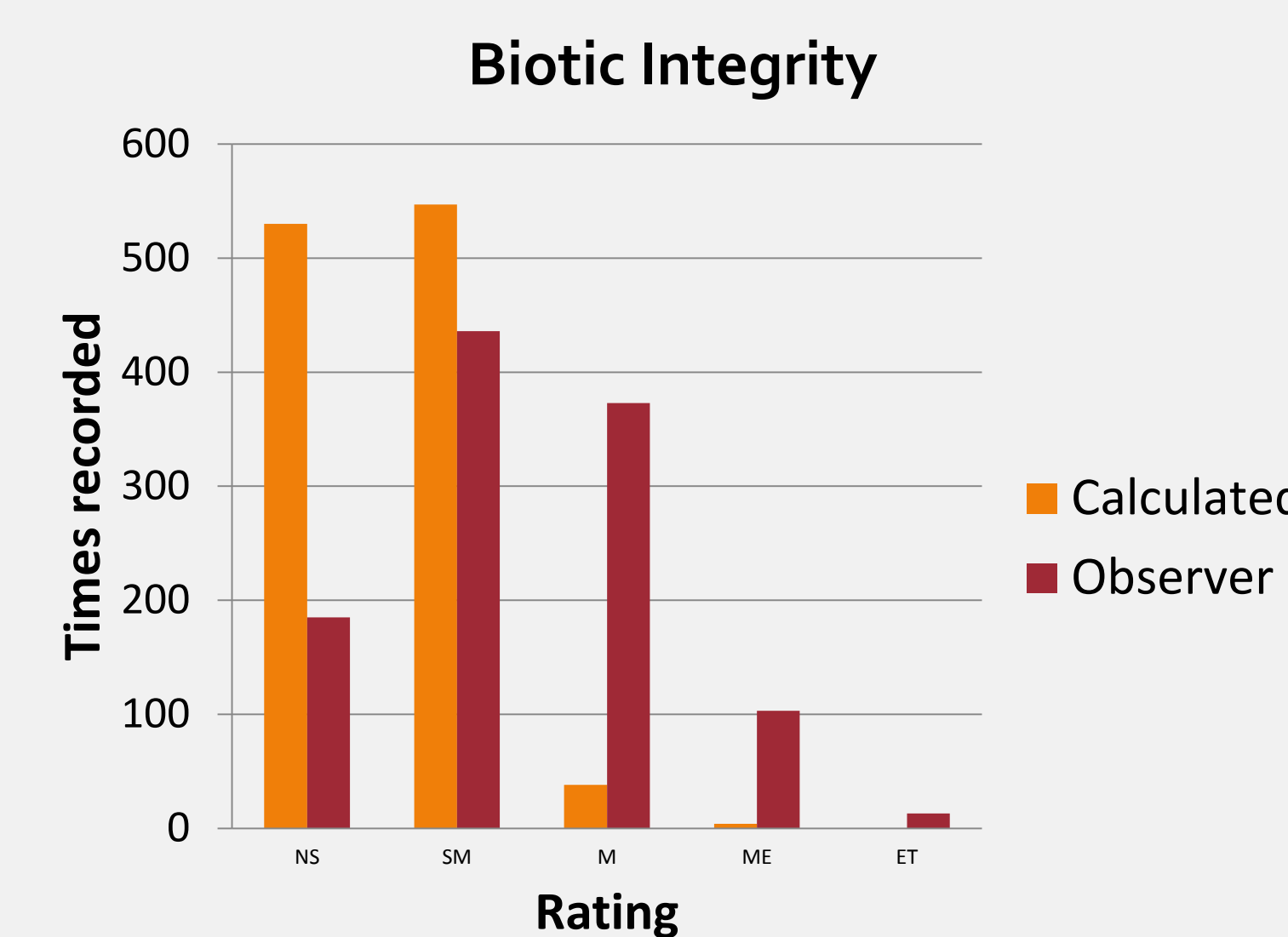
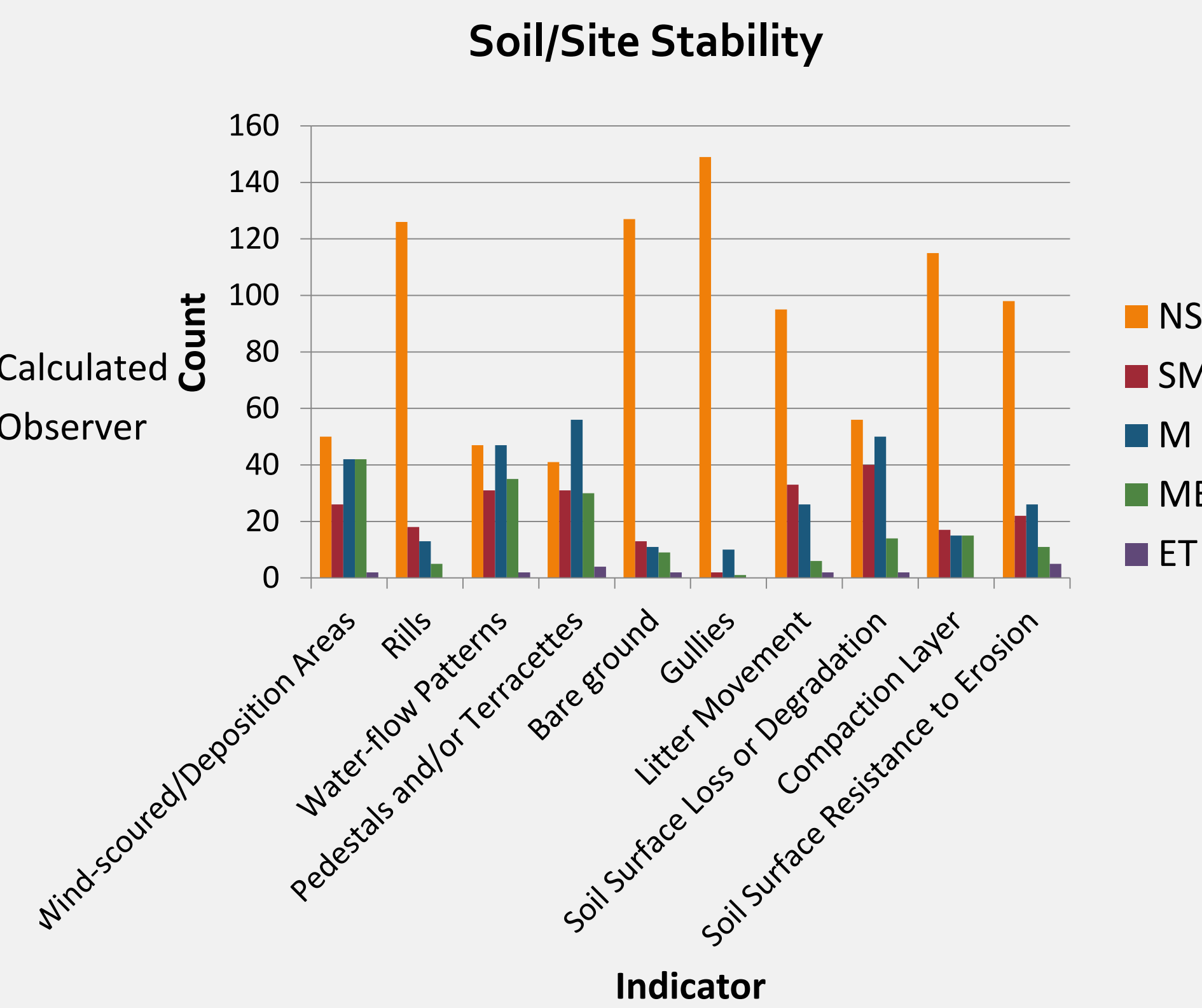
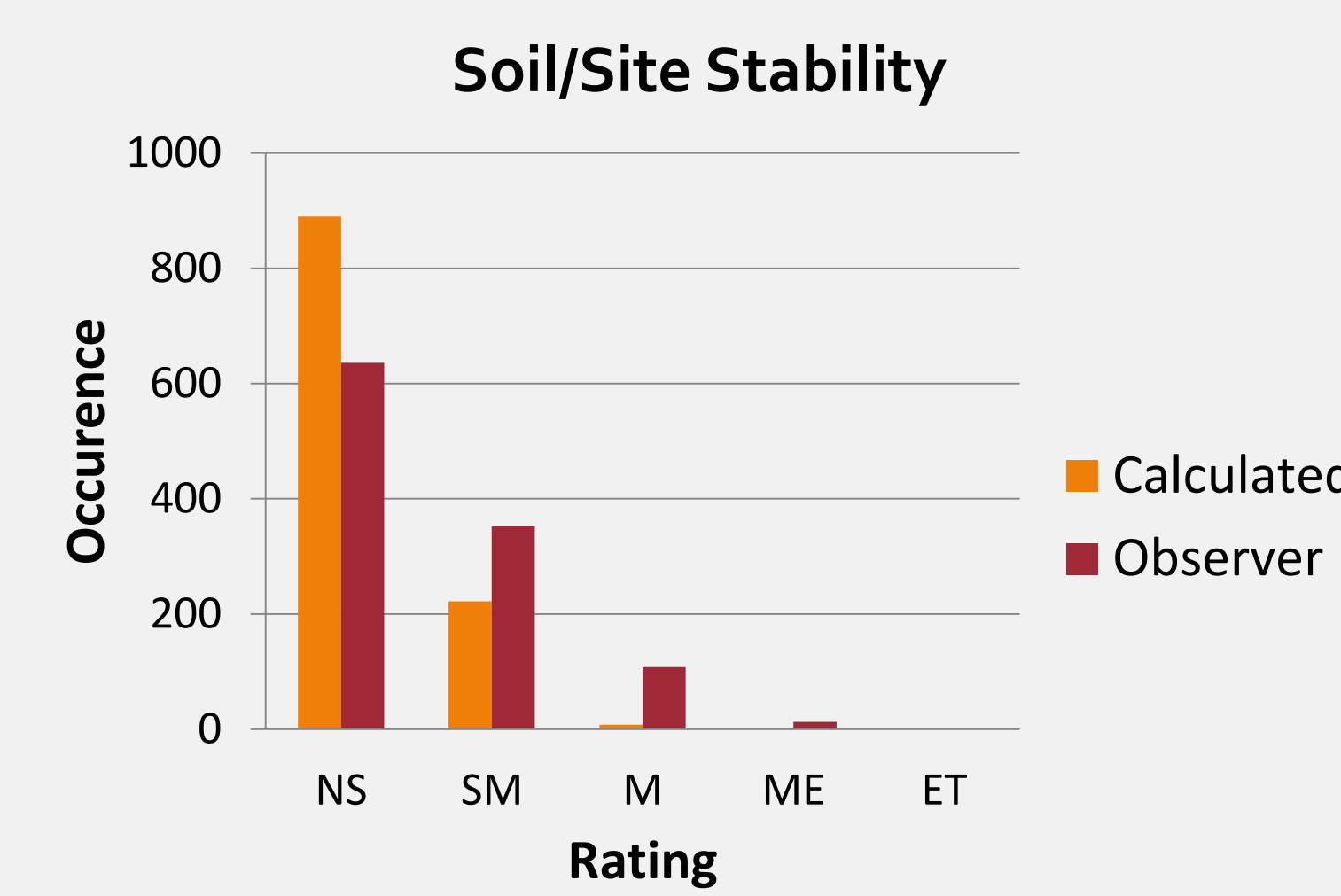
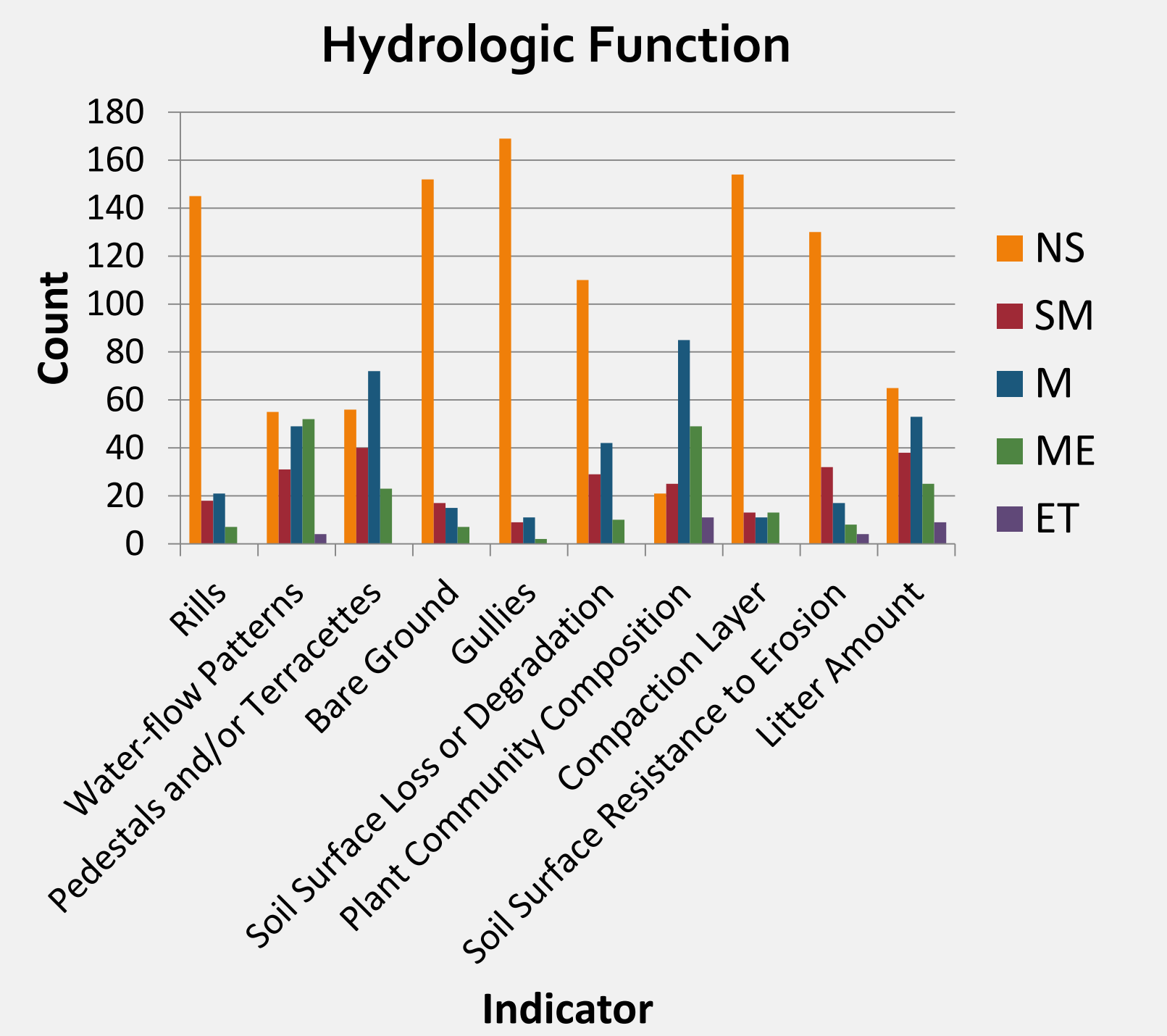
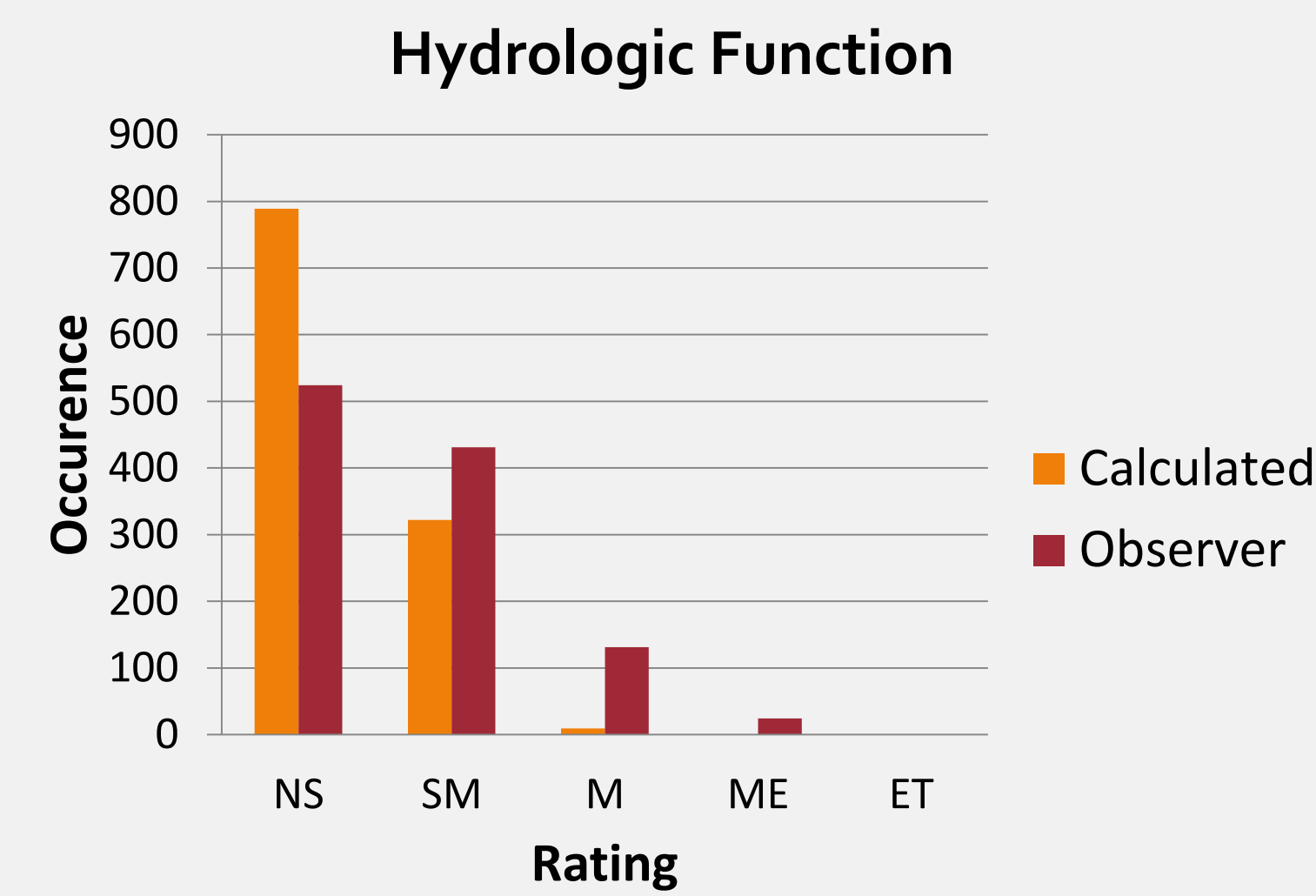
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Introduction & Purpose

- Indicators of Rangeland Health (IIRH) can provide a qualitative assessment used to evaluate ecosystem health on rangelands worldwide.
- The assessment provides an evaluation of three attributes of rangeland health: soil/site stability, hydrologic function, and biotic integrity to identify sites that are departed from reference condition.
- 17 individual ecosystem indicators are evaluated and are combined to evaluate the overall attribute rating
- The assessment provides useful information that helps land managers better understand how ecological processes are occurring, as shown by the indicators.
- During the evaluation process, the observer may make a final attribute rating based upon the average of the indicator ratings for each attribute or based upon the preponderance of evidence approach where observer knowledge of the ecosystem and importance of the indicators is used to determining the attribute departure from reference.
- An observer conducting a range assessment may have more confidence in determining certain indicators, based on the preponderance of evidence, causing the results to be observer biased.

	Soil/Site Stability	Hydrologic Function	Biotic Integrity
Rills	X	X	
Water Flow Patterns	X	X	
Pedestals and/or Terracettes	X	X	
Bare Ground	X	X	
Gullies	X	X	
Wind Scoured, Blowouts and /or Deposition Areas	X		
Litter Movement		X	
Soil Surface Resistance to Erosion	X	X	X
Soil Surface Loss or Degradation	X	X	X
Plant Community Composition & Distribution Relative to Infiltration & Runoff		X	
Compaction Layer	X	X	X
Functional/Structural Groups			X
Plant Mortality/Decadence			X
Litter Amount		X	X
Annual Aboveground Production			X
Invasive Plants			X
Reproductive Capability of Perennial Plants			X

Results



The three graphs above show a pattern of a increase in the observer rating when looking at Moderate to Extreme to Total (ET) departure from reference ratings.

When the final attribute rating is Moderate (M) or greater, the three graphs above show that easier to understand indicators, such as plant community composition, receive more M-ET ratings.

Conclusion

- Because of the importance of local knowledge of the system, using the “preponderance of evidence” approach in these assessments is still recommended, however trainers and users should be aware of observer tendencies in making the final attribute ratings.
- Observer final attribute ratings tend to weight attribute ratings as more departed from reference than the calculated attribute ratings. This is especially common for the Biotic Integrity Attribute (50.1% of times).
- Observers tend to increase the departure from reference based on indicators which are described quantitatively (e.g., bare ground, vegetation composition, invasive species)
- Qualitative indicators which are easier to understand (e.g., rills and terracettes) may have more influence in the final attribute rating than those which are less easily understood (e.g. compaction).
- Further analysis of these relationships using statistical tests (e.g., logistic regression) will provide greater understanding of the relationship between an individual rating and a final attribute rating.
- A possible solution to minimize the impact of rating inflation would be to provide additional training and education opportunities, which would increase an evaluator’s familiarity with all seventeen indicators. Emphasis should be placed on taking notes and written description of each indicator at the site in addition to the indicator rating to justify departure from reference

Soil Stability Final > Calculated	Hydrologic Function Final > Calculated	Biotic Integrity Final > Calculated	Total
359	401	766	1526
23.5%	25.3%	50.1%	100%

Methods

- We examined 1,526 plots from a large scale monitoring program, over a period of four years.
- We then compared the final evaluator attribute ratings to the initial calculated attribute ratings from the data.
- When there was a difference between the two, we further examined the individual indicator ratings.

References

Pellant, M. (2005). *Interpreting Indicators of Rangeland Health version 4*. Denver, Colo.: U.S. Dept. of the Interior, Bureau of Land Management, National Science and Technology Center, Division of Science Integration, Branch of Publishing Services.

Pye, D., Herrick, J., Shaver, P., & Pellant, M. (2002). Rangeland Health Attributes and Indicators for Qualitative Assessment. *Journal of Range Management*, 22(6), 584-597. Retrieved January 28, 2015, from http://www.jstor.org/stable/4004002?seq=1#page_scan_tab_contents