

State of the Cienega Watershed

Survey of Criteria and Indicators



CIENEGA WATERSHED
Partnership

Introduction

This brief survey was designed to help identify a common set of overarching criteria and cross-jurisdictional indicators that can be used to monitor and evaluate the health of the Cienega Watershed over the long term.



www.mwdl.org

Empire Gulch on the Las Cienegas National Conservation Area

Methodology

We developed this online survey based on input received during the State of the Watershed Workshop (February 2015). Workshop participants identified a wide range of criteria and indicators that could serve as a foundation for monitoring watershed health. These included:

9 selection criteria for evaluating the indicators.

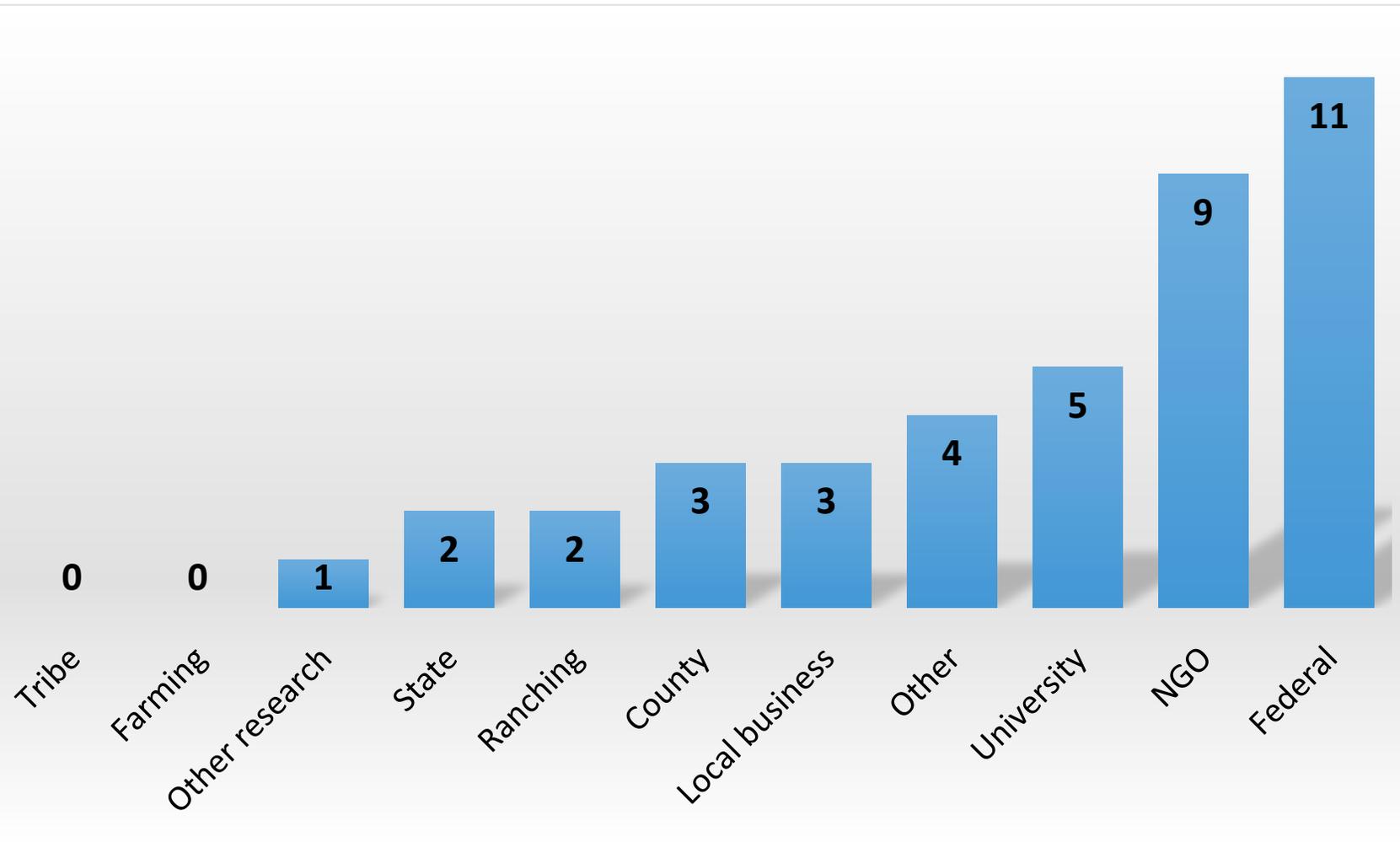
47 candidate indicators, divided into 4 categories:

- Upland (11)
- Riparian (9)
- Social (14)
- Landscape (13)

The survey was distributed through email to a list of 84 stakeholders from November 10 to December 6, 2015.

Total number of responses was 40 (response rate = 47.61 %)

Results: Affiliation

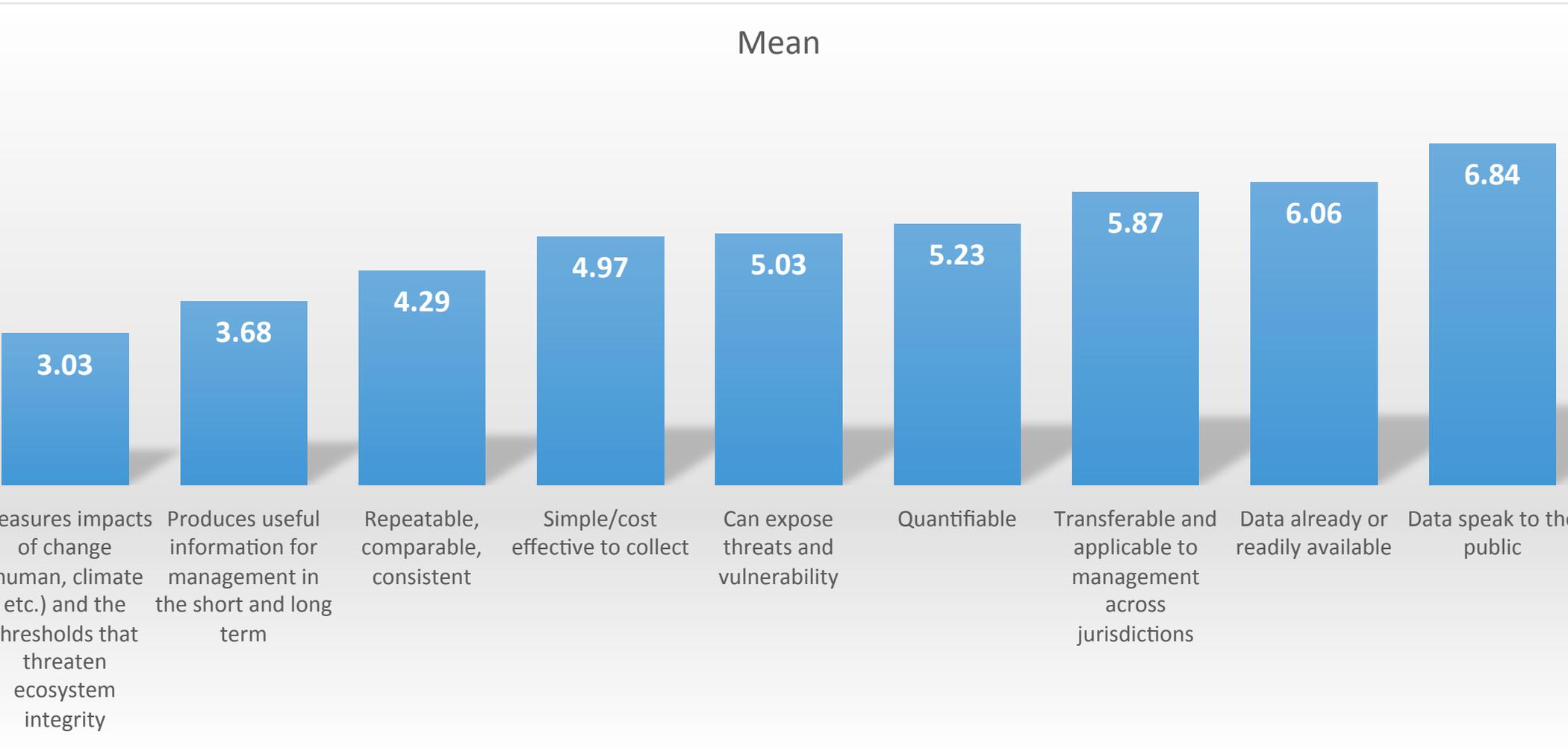


N=40

Other:

- Adjacent landowne
- Independ biologist

Results: Ranking of Selection Criteria



Note: Lower values = more important

Results: Ranking of Selection Criteria

- . Measures impacts of change (human, climate, etc.) and the thresholds that threaten ecosystem integrity.
- . Produces useful information for management in the short and long term.
- . Repeatable, comparable, consistent.
- . Simple/cost effective to collect.
- . Can expose threats and vulnerability.
- . Quantifiable.
- . Transferable and applicable to management across jurisdictions.
- . Data already or readily available.
- . Data speaks to the public.

Note: Lower values = more important

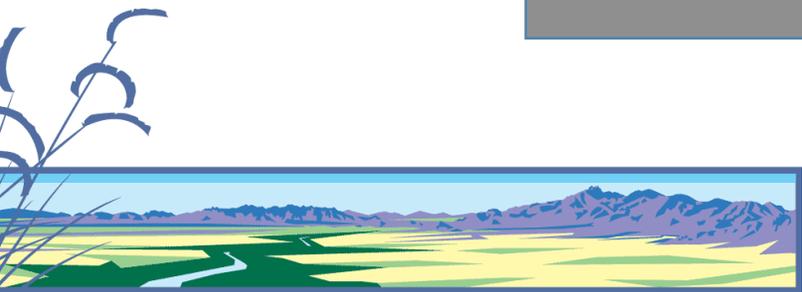
Indicators

Upland

Riparian

Social

Landscape

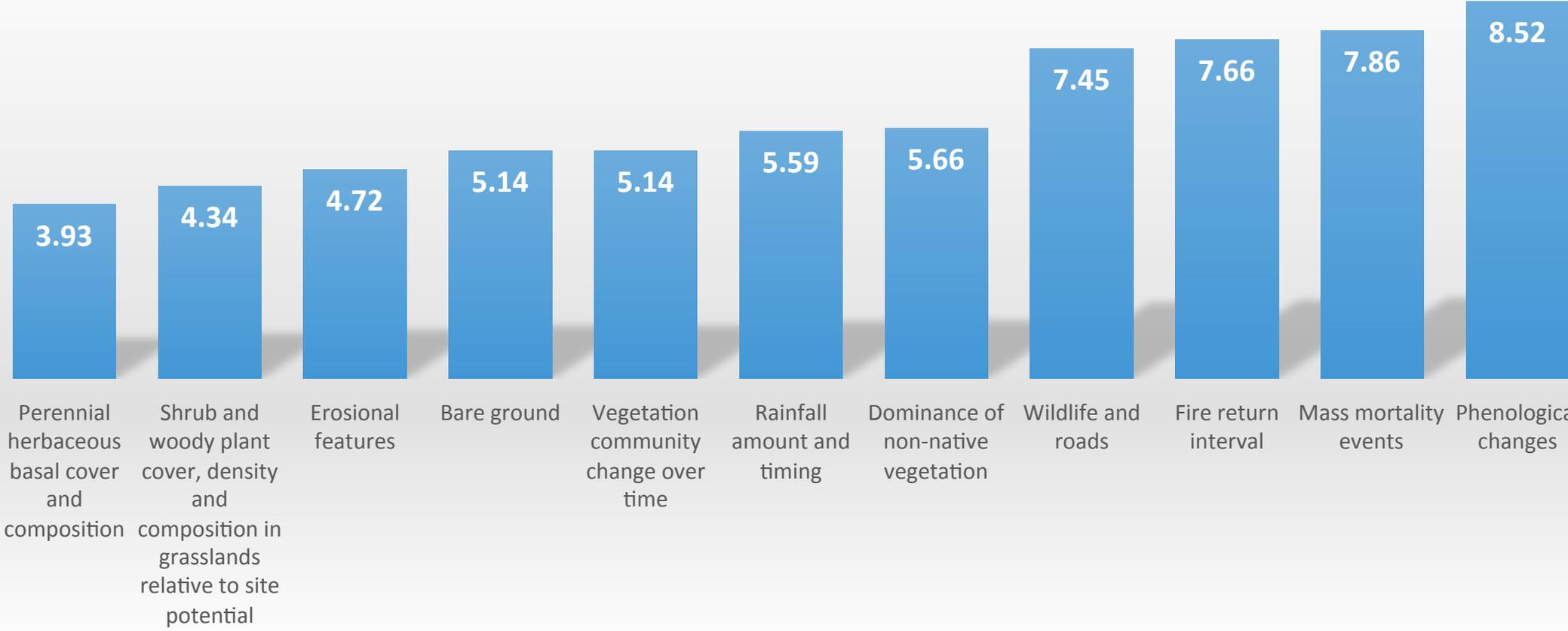


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Results

Upland

Mean

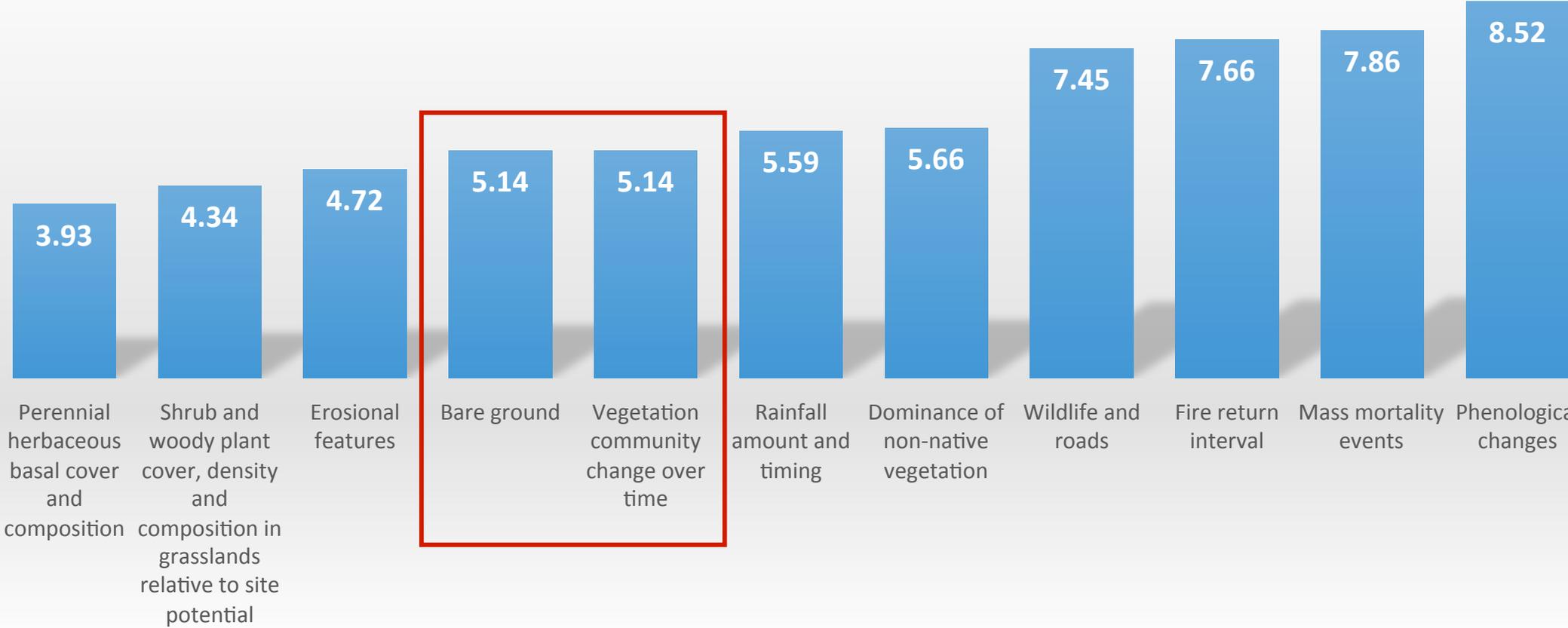


Note: Lower values = more important

Results

Upland

Mean



Note: Lower values = more important

Results

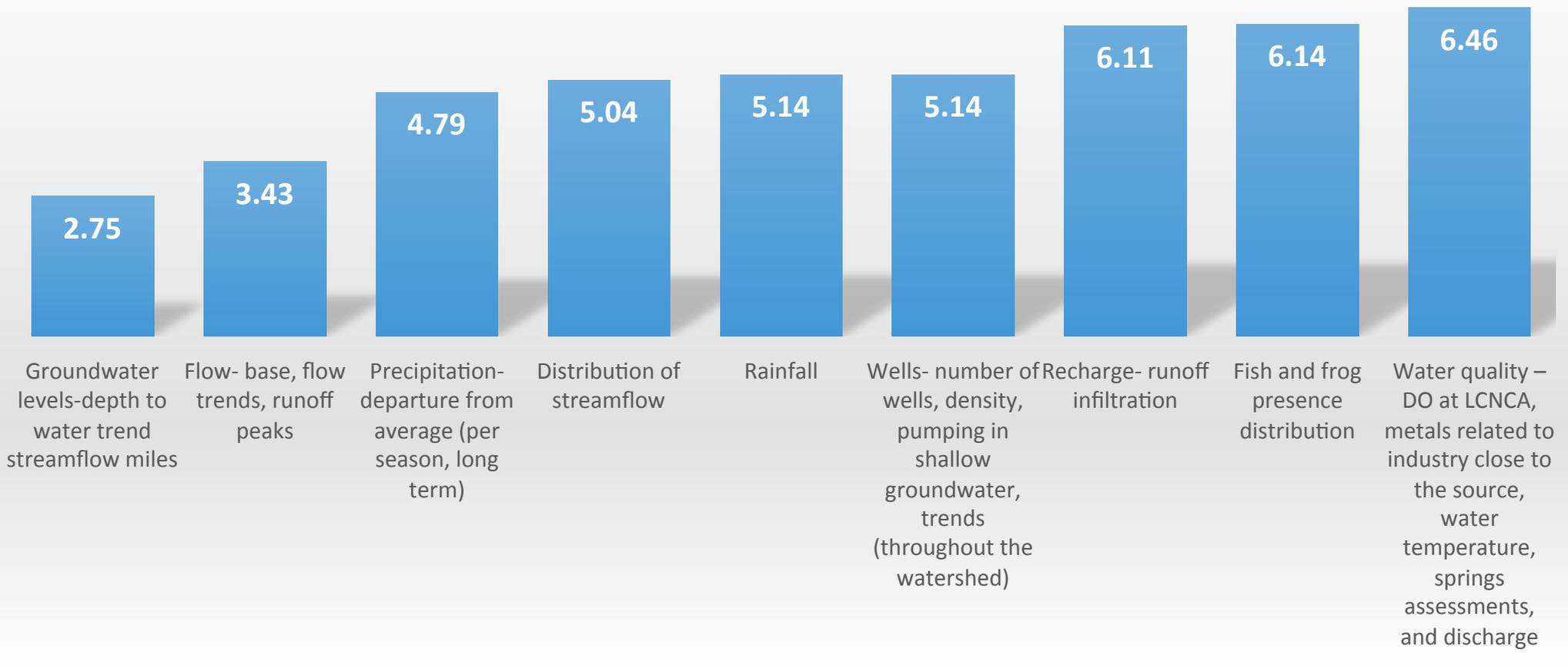
- . Perennial herbaceous basal cover and composition.
- . Shrub and woody plant cover, density and composition in grasslands relative to site potential.
- . Erosional features.
- . **Vegetation community change over time / Bare ground (TIE)**
- . Rainfall amount and timing.
- . Dominance of non-native vegetation.
- . Wildlife and roads.
- . Fire return interval.
- . Mass mortality events.
- 0. Phenological changes

Note: Lower values = more important

Results

Riparian

Mean

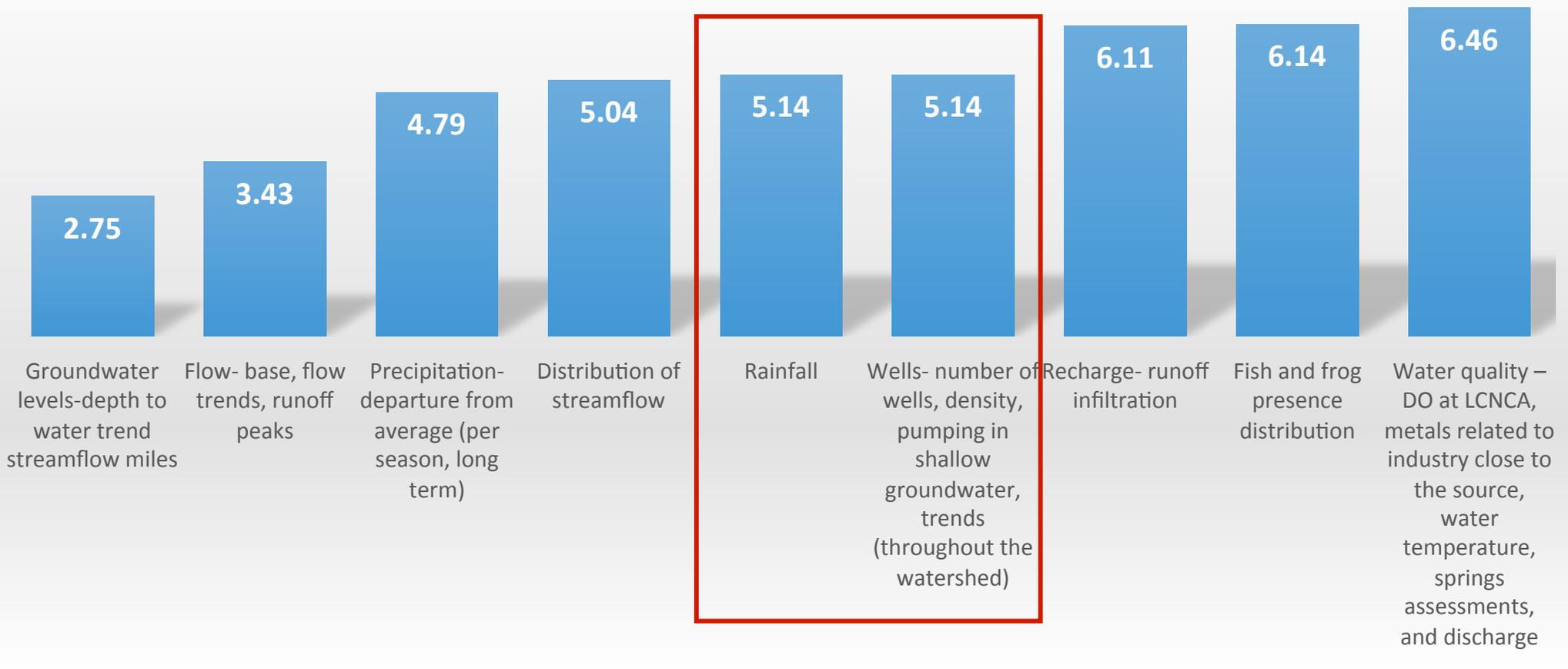


Note: Lower values = more important

Results

Riparian

Mean



Note: Lower values = more important

Results

Riparian

Groundwater levels-depth to water trend streamflow miles.

Flow-base, flow-trends, runoff peaks.

Precipitation-departure from average (per season, long-term).

Distribution of streamflow.

Rainfall / Wells, number of wells, density, pumping in shallow water, trends (throughout the watershed) (TIE).

Recharge-runoff infiltration.

Fish and frog presence distribution.

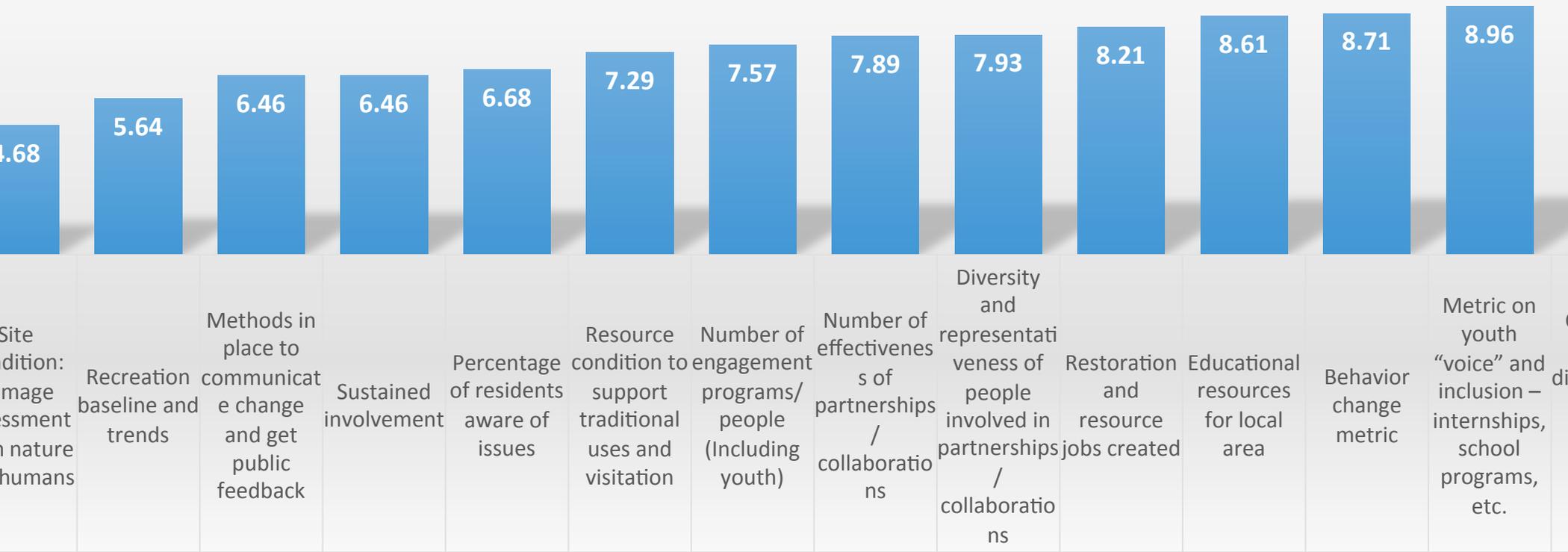
Water quality – DO at LCNCA, metals related to industry close to the source, water temperature.

Note: Lower values = more important

Results

Social

Mean

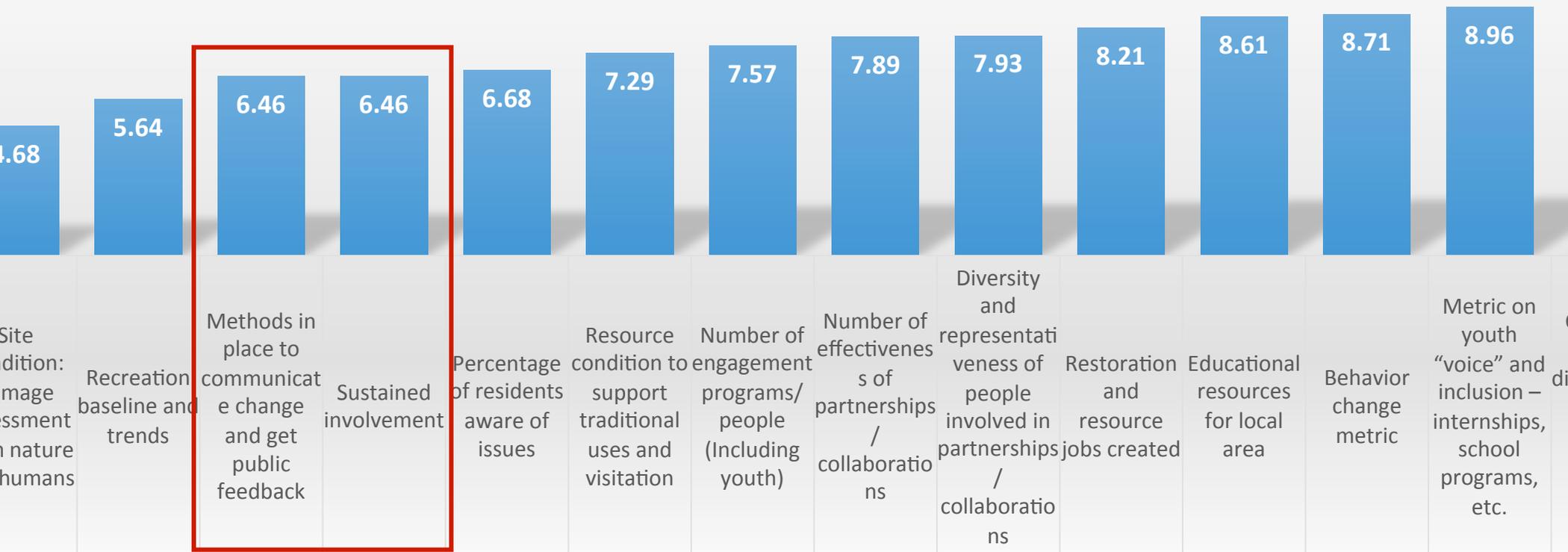


Note: Lower values = more important

Results

Social

Mean



Note: Lower values = more important

Results

Social-Cultural

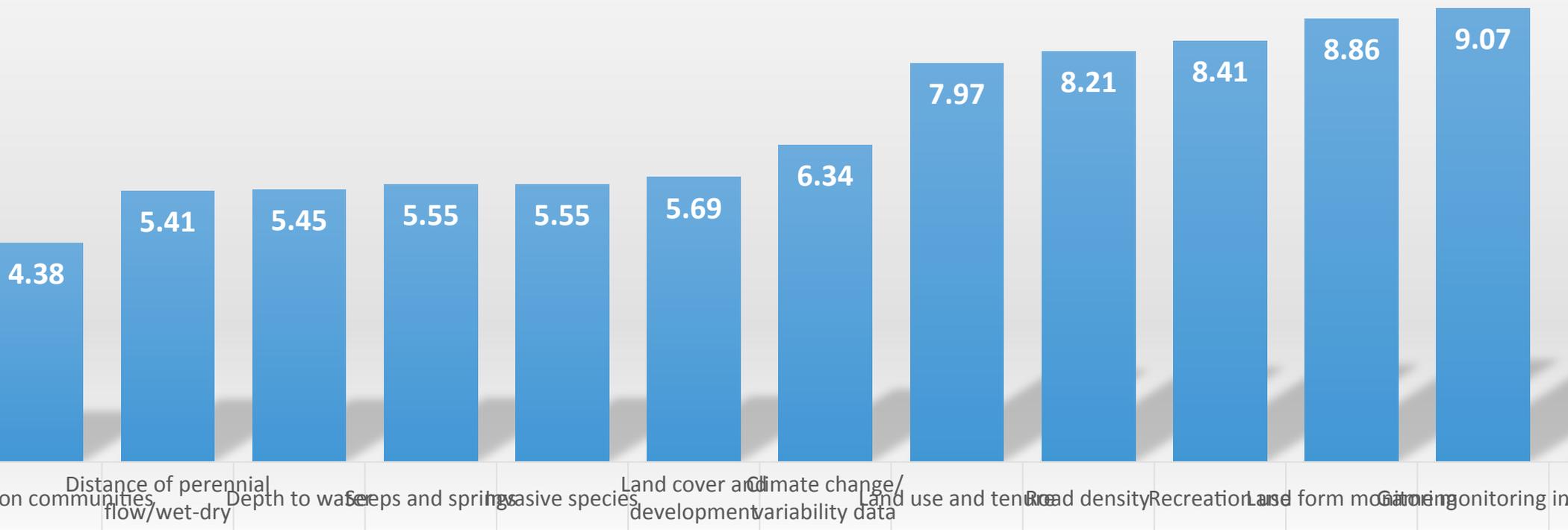
- . Site condition: damage assessment from nature and humans.
- . Recreation baselines and trends.
- . Methods in place to communicate change and get public feedback / Sustained involvement (T**
- . Percent of residents aware of issues.
- . Resource condition to support traditional uses and visitation.
- . Number of engagement programs/people (including youth).
- . Number of effectiveness of partnerships/collaborations.
- . Diversity and representativeness of people involved in partnerships/ collaborations
- . Restoration and resource jobs created.
- 0. Educational resources for local area.
- 1. Behavior change metric.
- 2. Metric on youth “voice” and inclusion – internships, school programs, etc.
- 3. Collecting and disseminating shared history in multiple forms.

Note: Lower values = more important

Results

Landscape

Mean

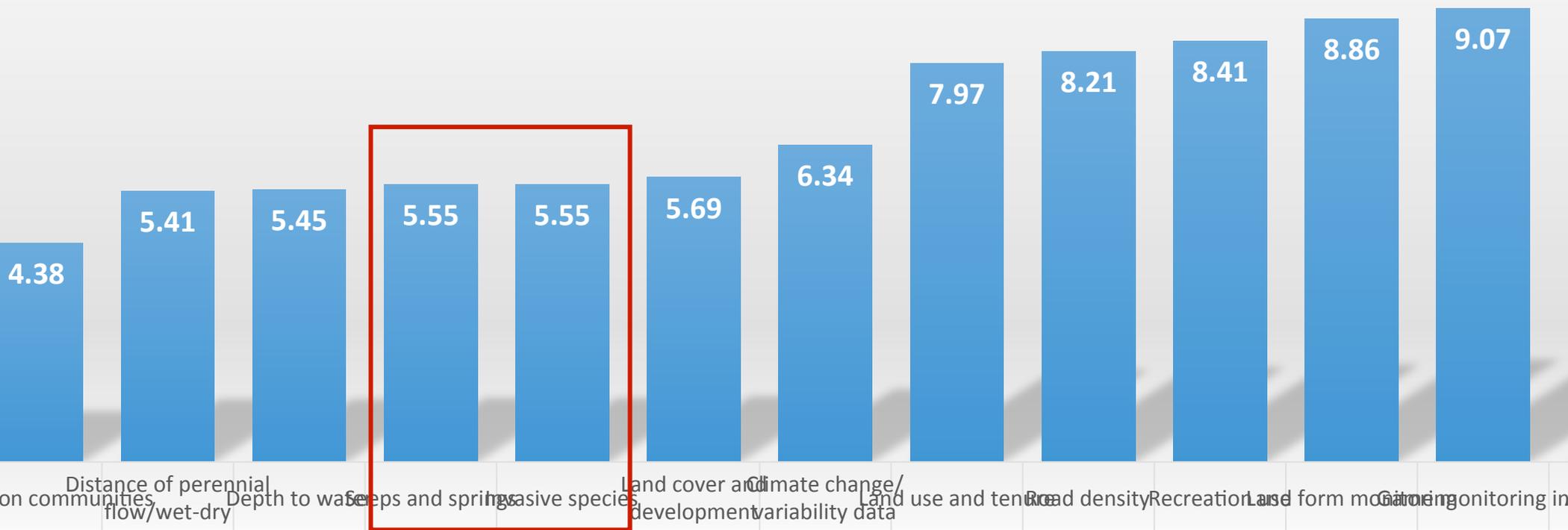


Note: Lower values = more important

Results

Landscape

Mean



Note: Lower values = more important

Results

Landscape

1. Vegetation communities.
2. Distance of perennial flow/wet-dry.
3. Depth to water.
- 4. Seeps and springs / Invasive species (TIE).**
5. Land cover and development.
6. Climate change/ variability data.
7. Land use and tenure.
8. Road density.
9. Recreation use.
10. Land form monitoring.
11. Game monitoring information.
12. Air quality.

Note: Lower values = more important

Summary of Indicators

UPLAND

1. Perennial herbaceous basal cover and composition
2. Shrub and woody plant cover, density and composition in grasslands relative to site potential
3. Erosional features
4. **Bare ground / Vegetation community change over time (TIE)**

SOCIAL

1. Site condition: damage assessment from nature and humans
2. Recreation baselines and trends
3. **Methods in place to communicate change and get public feedback / Sustained involvement (TIE)**
4. Percent of residents aware of issues

RIPARIAN

1. Groundwater levels-depth to water trend streamflow miles
2. Flow-base, flow-trends, runoff peaks
3. Precipitation-departure from average
4. Distribution of streamflow
5. **Rainfall / Number of wells, density, pumping in shallow groundwater, trends (TIE)**

LANDSCAPE

1. Vegetation communities
2. Distance of perennial flow/wet-dry
3. Depth to water
4. **Seeps and springs / Invasive species (TIE)**
5. Land cover and development
6. Climate change/ variability data

Next Steps

Review all indicators – seek consensus on final list

Determine which data is at higher priority, which is already available, and which data will need to be collected

Identify sources, stewards, and resources to support collection of additional data

Identify where we can use proxies, where we need to do additional data collection

Decide how to consolidate, present, and communicate results