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The Use of USEPA Recovery Potential and Screening as it Relates to the Restoration of Utah Lake

Technical Memo

To
Wasatch Front Water Quality Council

Prepared By
David C. Richards, Ph.D.

OreoHelix Ecological, Vineyard UT 84059
Phone: 406.580.7816
Email: oreohelix@icloud.com

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Justification

The goal of USEPQA Recovery Potential (as Screening) (RP/RPS) is to demonstrate a systematic assessment of recovery potential of impaired waterbodies in the USA (Wickham and Norton 2008, https://www.epa.gov/rps). Recovery potential, while difficult to define precisely, embodies the concept that site characteristics, disturbance history, and socio-economic context provide useful information on the likelihood of restoration success (Wickham and Norton 2008). RP/RPS are mostly focused on watersheds but with some modification can be customized and used on individual water bodies (https://www.epa.gov/rps), such as Utah Lake.

USEPA (https://www.epa.gov/rps) groups diverse factors that can affect waterbody condition and the prospects for restoration success into three major categories for use in an RPS:

1. Ecological
2. Stressor
3. Social.

Restoration Potential Screening Metrics

Ecological Indicators

A quick superficial review of the key sub-categories for ecological indicators suggest that Utah Lake meets almost all of the criteria for low restoration success without massive intervention. The following are the key sub -categories for RPS ecological indicators.

Watershed natural structure

Example Indicators
• watershed % natural cover • watershed % forest • watershed % wetlands • watershed woody vegetation • watershed topographic complexity • watershed forest patch mean area • watershed soil resilience • watershed % streamlength unimpaired • watershed shape • watershed size

Corridor and shorelands stability

Example Indicators
• bank stability/soils • bank stability/woody vegetation • corridor % forest • corridor % woody veg • corridor % wetlands • corridor slope • corridor soil erosion potential • corridor soil type • shoreline % forested • shoreline % woody veg

Biotic community integrity

Example Indicators
• biotic community integrity • rare taxa presence • trophic state • NFHAP fish habitat condition index

Ecological history

Example Indicators
• maintenance of % natural cover • ratio current/historic % forest • ratio current/historic % wetlands • historical species occurrence • species range

Aquatic connectivity

Example Indicators
• confluence density • unimpaired confluences density • watershed stream density • contiguity with green infrastructure corridor • proximity to green infrastructure hub • recolonization access

Stressor Indicators

Utah Lake also meets and exceeds almost all of the criteria for many of the RPS key sub-categories for stressor indicators for low restoration success without intensive intervention. The stressor sub-categories are as follows:

Watershed-level disturbance

Example Indicators

- watershed % agriculture
- watershed % steep slope agriculture
- watershed # of CAFOs
- watershed # of septic systems
- watershed % impervious cover
- watershed % tile-drained cropland
- watershed % U index (non-natural cover)
- watershed % urban
- watershed road density

Corridor or shorelands disturbance

Example Indicators

- corridor % impervious cover
- corridor % tile-drained cropland
- corridor % U-index (non-natural cover)
- corridor % urban
- corridor % agriculture
- linear % of channel through agriculture
- corridor road crossings
- corridor road density

Hydrologic alteration

Example Indicators

- aquatic barriers
- channelization
- hydrologic alteration
- relative net water demand
- water use intensity

Biotic or climatic risks

Example Indicators

- elevation
- invasive species risk

Severity of pollutant loading

Example Indicators

- number of 303d listed causes
- number of permits
- CSO or MS4 areas
- age of sewer infrastructure
- severity of loading
- stressor persistence
- SPARROW nitrogen loading estimate
- SPARROW phosphorus loading estimate
- watershed stream miles impaired
- watershed waterbody acres impaired
- modeled watershed aerial deposition of N
- modeled watershed aerial deposition of Hg
- other stressor-specific severity factors

Legacy of past, trajectory of future land use

Example Indicators

- land use change trajectory
- legacy land uses
- watershed % legacy agriculture
- watershed % legacy urban
- corridor % legacy agriculture
- corridor % legacy urban

Social Indicators

Utah Lake appears to meet or exceed the key sub-categories criteria for social context indicators strongly pointing towards low restoration success without intensive, costly, and coordinated intervention. These criteria can be found at https://www.epa.gov/rps/overview-selecting-and-using-recovery-potential-indicators.

Recommendation

It appears that on initial examination, Utah Lake would meet USEPA criteria for a waterbody with low recovery potential using RPS. A thorough comprehensive evaluation of the recovery potential of Utah Lake using customized and standard USEPS Recovery Potential Screening Indicators needs to be conducted. This analysis should also include the potential effectiveness of ongoing plans and efforts to help restore the lake.

Literature Cited

Wickham, J. D. And D. J. Norton. Recovery Potential as a Means of Prioritizing Restoration of Waters Identified as Impaired Under The Clean Water Act. Water Practice. Water Environment Federation, Alexandria, VA, 21(1):1-11, (2008).

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