Resource Brief

National Park Service
U.S. Department of the Interior

Klamath I&M Network
Natural Resource Stewardship and Science

Vital Sign Update: 2022 Results for Streams Monitoring at Oregon Caves National Monument and Preserve

Importance

Spreading water and essential nutrients across the land and gracing the scenery, streams are key natural resources at Oregon Caves National Monument and Preserve. Because streams carry evidence of upstream and upslope disturbances, both natural and human-caused, we can examine their biological, physical, and chemical qualities to understand watershed health. Since 2012, we've been monitoring streams as a vital sign of the park's health to inform park managers about current conditions and any concerning changes. This brief describes how we measure the *biological* component of stream health—aquatic invertebrates—and what we found in 2022.

Why aquatic invertebrates (stream bugs)?

Many aquatic invertebrate species inhabit Oregon Caves' streams. Because each one requires different food sources, habitat, and tolerates different water chemistry, the species that show up in our samples tell us a lot about conditions in the stream. Furthermore, their habits and life history make them ideal for monitoring. They reproduce quickly, providing immediate evidence of changes happening in the stream that affect them. They remain close to their birthplace, tying their occurrence more closely to the immediate conditions around them. As a critical link in the food web, they can teach us about the condition of the primary producers they consume (algae or fallen leaf litter, for example) and predators (fish and amphibians) that eat them. They also tend to respond predictably to human-caused disturbances.

The "kick net" method for sampling aquatic invertebrates. We kick the streambed to knock invertebrates loose into our submerged net waiting just downstream. We complete the sample by scrubbing individual cobbles with our hands. No Name Creek.

What are multimetric indices?

To assess stream health, we calculate several multimetric indices based on the mix of invertebrate species in our samples. Each species or species group, with its unique characteristics, provides different information about water quality, such as the number of species in the sample that tolerate sediments, or the number of individuals that can't tolerate warm water. The unique mix of each sample translates into an overall measure of water quality, ranging from pristine to severely degraded. You can think of each index a little bit like the Dow Jones Industrial Average or NASDAQ, with each providing a slightly different picture of the stock market.

What are O/E scores?

One useful metric we calculate is the O/E score, or Observed/Expected Ratio of Taxa Loss. Simply put, it is the ratio of how many species of invertebrates we observed in a stream compared with how many species we'd expect to find in healthy conditions. The smaller the ratio (fewer species observed than expected), the more concerned we are about biodiversity loss in the stream.

Results and Future Monitoring

In early summer 2022, we sampled 3 stream sites at Oregon Caves. View the map on the back for detailed results. We'll sample Oregon Caves' streams again in 2025.

More Information

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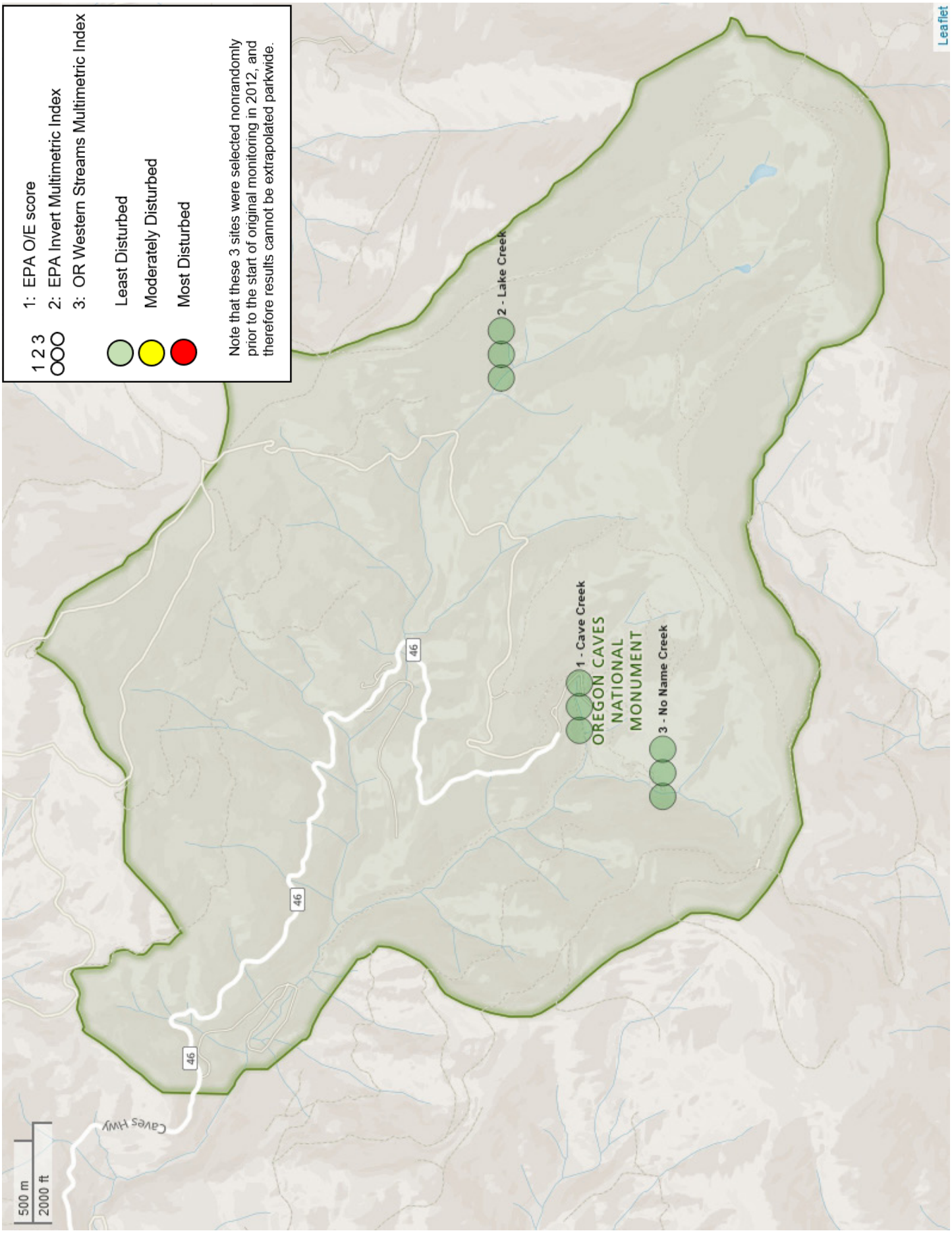
Project overview, reports, and protocol:
https://www.nps.gov/im/klmn/streams.htm

Datasets and all related publications:
https://irma.nps.gov/DataStore/Reference/Profile/2171797


1 2 3
1: EPA O/E score
2: EPA Invert Multimetric Index
3: OR Western Streams Multimetric Index
Least Disturbed
Moderately Disturbed
Most Disturbed
Note that these 3 sites were selected nonrandomly prior to the start of original monitoring in 2012, and therefore results cannot be extrapolated parkwide.
2 - Lake Creek
1 - Cave Creek
OREGON CAVES NATIONAL MONUMENT
3 - No Name Creek
46
46
46
Caves Hwy
500 m
2000 ft
Leaflet