VALUING HETCH HETCHY VALLEY

ECONOMIC BENEFITS OF RESTORATION IN YOSEMITE NATIONAL PARK

July 2019

(Photo: Courtesy of National Park Service and Yosemite Conservancy)

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Yosemite Valley (Courtesy of Unsplash. Photo by Jeremy Bishop.)

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STUDY PURPOSE

Restore Hetch Hetchy,[1] a not-for-profit, non-governmental organization, commissioned ECONorthwest, an economics firm, to investigate the economic benefits that might be realized by restoring Hetch Hetchy Valley in Yosemite National Park. These economic benefits include the value of recreation for park visitors as well as passive-use, or existence values, associated with restoring a well-known landscape in an iconic national park. The study is not a full benefit-cost analysis which would include the costs necessary to accommodate restoration, including changes San Francisco would be required to make to its water system.

View of reservoir and Kolana Rock. (Courtesy of Wikipedia, photo by King of Hearts, 2011)

STUDY APPROACH

This study projects the value of two categories of benefits that would occur with restoration of Hetch Hetchy Valley. The first analysis is an estimate of the amount of visitation and its economic value. This analysis involves limited assumptions regarding development of facilities to accommodate increased visitation to Hetch Hetchy Valley and its surrounding area. Former National Park Service personnel interviewed for this study by ECONorthwest uniformly agree that Hetch Hetchy Valley would likely be kept closer to its natural state than Yosemite Valley, where extensive buildings, roads and other infrastructure are prevalent and traffic congestion is common, particularly on summer weekends. While this study does not include a full assessment of transportation and access scenarios, it does consider a range of potential usage scenarios and corresponding potential recreation benefits.

Restoration would create opportunities for fishing in Hetch Hetchy Valley as well as upstream reaches of the Tuolumne River and its side streams. (Courtesy of Echo Cooperative)

While most visitors to Yosemite are from California, many do come from other states and countries, particularly Europe and Asia. Data also indicate that more visits are locally generated (i.e. from California) in the winter months when trip planning around weather is easier to accomplish. The great majority of visitors to Yosemite come in spring and summer months, however, and this is presumed to be true also of potential visitors to Hetch Hetchy Valley.

Most visitors to Yosemite Valley come by car. Many drive from the San Francisco Bay Area and southern California. Population growth in San Joaquin Valley counties close to Yosemite has outpaced the State as a whole and may make

Yosemite National Park's Visitor Center provides brochures in 7 languages — Chinese, French, German, Italian, Japanese and Spanish, in addition to English — reflecting the origins of some of the park's many visitors.

[1]Restore Hetch Hetchy's self-defined mission is, *"To return the Hetch Hetchy Valley in Yosemite National Park to its natural splendor — while continuing to meet the water and power needs of all communities that depend on the Tuolumne River."*

Annually, millions of tourists visit Yosemite Valley to enjoy the breathtaking scenery and amazing wildlife while taking part in a number of activities such as hiking, fishing, and climbing. (Photo by Colette Robinson)

up a larger percentage of overall visitors to the park over time. While visitors to a restored Hetch Hetchy Valley are likely to travel by automobile as well, the National Park Service may, with public input, develop parking outside the valley or even the park itself and provide public transportation for visitors to the valley. This conservation strategy is already in practice for Denali National Park.

This study assumes that visitors to Hetch Hetchy Valley would be attracted to the same mix of activities that attract visitors to Yosemite Valley and similar national parks and natural areas. These activities include (but are not limited to), sightseeing, hiking, bicycling, camping, and wildlife viewing. This analysis does not attempt to determine to what extent visitors would be preferentially attracted to the valley because it is less developed than Yosemite Valley. Nor does this analysis attempt to determine how many visitors would be discouraged if the valley were not accessible by a private automobile.

HISTORY

Yosemite National Park once hosted two glacier-carved valleys — Hetch Hetchy Valley along the Tuolumne River and the famous Yosemite Valley along the Merced River. Yosemite Valley attracts millions of visitors each year from throughout California, across the United States and around the world.

In 1890, when Yosemite National Park was created by Congress, Hetch Hetchy Valley had many of the same features as Yosemite Valley. Both valleys were about seven miles long, surrounded by towering granite cliffs. Naturalist John Muir called Hetch Hetchy the, "Tuolumne Yosemite."

Hetch Hetchy Valley, however, was flooded in the early 20th century after Congress passed legislation, the Raker Act, allowing the City of San Francisco to build a dam and reservoir for water storage. While the cliffs and waterfalls are still visible to visitors, the valley floor is inaccessible, there are few trails, visiting hours are restricted, the reservoir is off-limits to protect water supply and most camping is prohibited. The Hetch Hetchy area draws only about 40,000 visitors per year.

View across Hetch Hetchy Valley, early 1900s prior to damming. (Courtesy of Wikipedia)

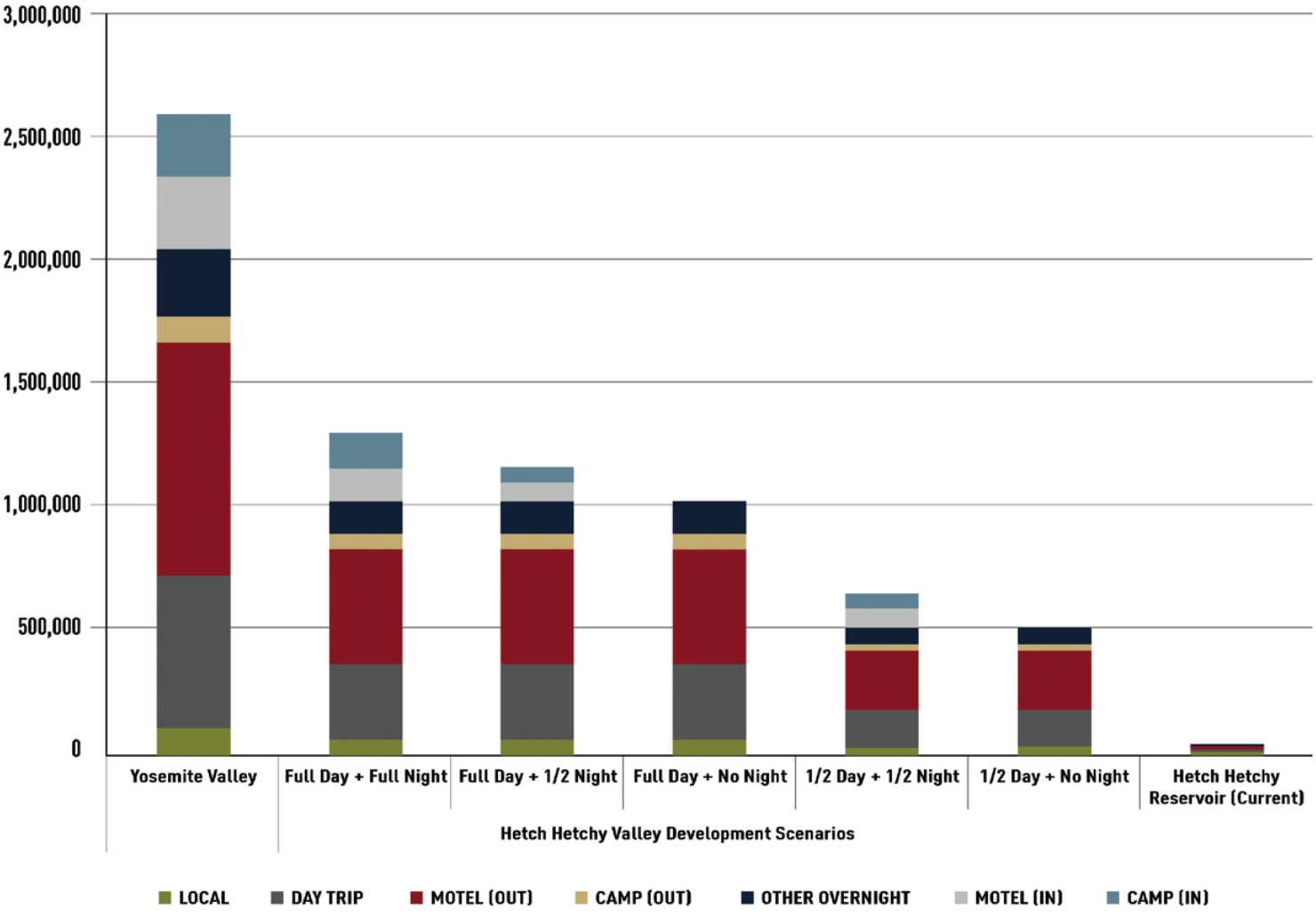
VISITATION ASSUMPTIONS

To assess the value of increased recreation, this study considers several scenarios for how a restored Hetch Hetchy would accommodate visitors (even if all camping and lodging were located near to but outside the valley). For this purpose, the analysis applies visitor data from Yosemite National Park and Yosemite Valley to project potential use in Hetch Hetchy Valley. At a maximum, it is assumed that Hetch Hetchy Valley would receive one half the visitors that would come to Yosemite Valley, based on the size proportion of the two valleys.

The length of time each visitor would spend in the Hetch Hetchy area would be similar to current uses of Yosemite Valley, to the extent allowed by available lodging. Figure ES-1 provides estimates of visitation to a restored valley, based on the scenarios considered for this analysis.

A restored Hetch Hetchy would attract visitors for multiple days, especially if camping or lodging was available near or in the valley. (Courtesy of Unsplash. Photo by Tommy Lisbin)

FIGURE ES-1 ANNUAL VISITATION PROJECTIONS



VISITATION ASSUMPTIONS

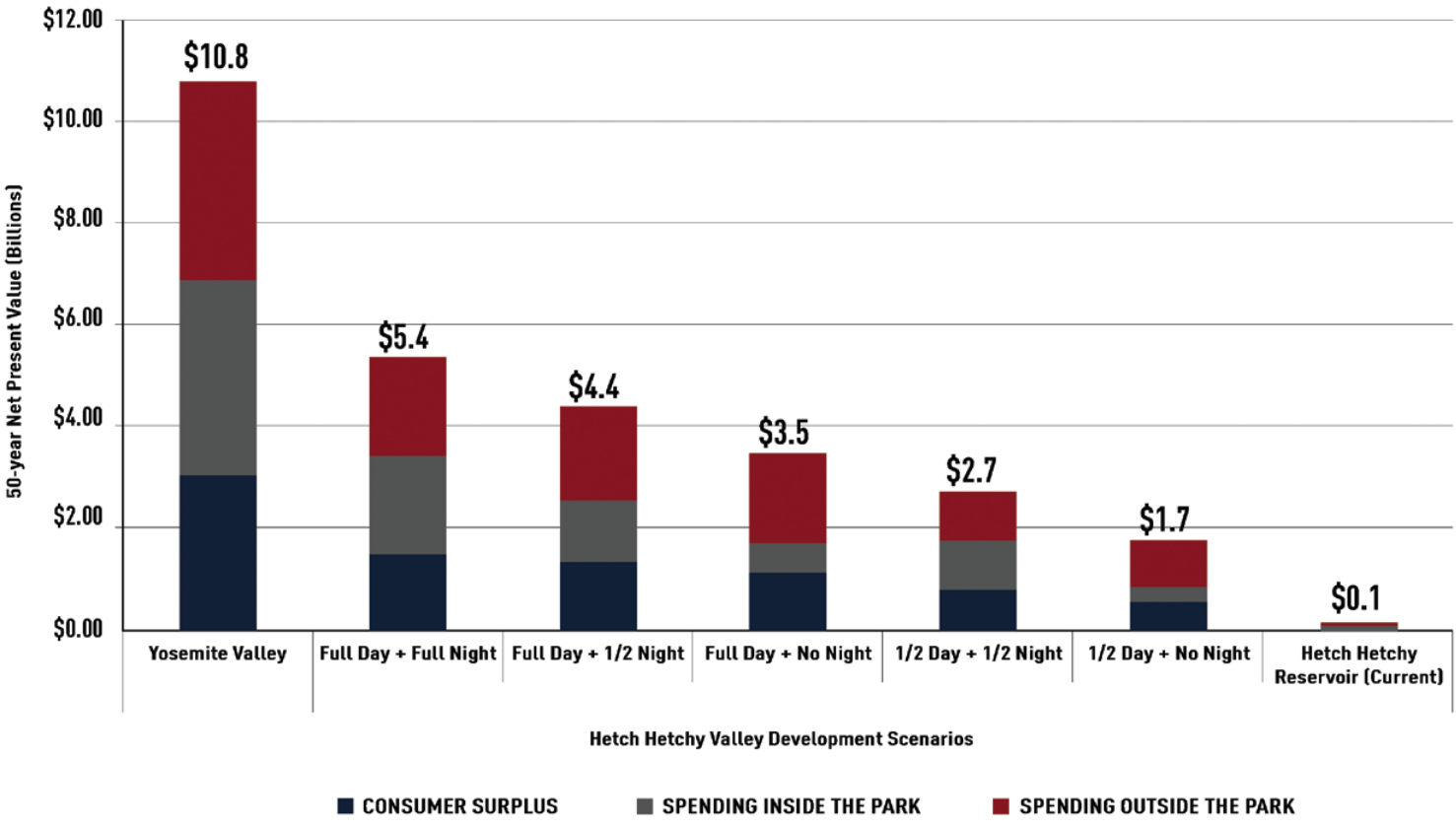
Yosemite Valley is considered the "Mecca" for rock climbers from around the world. Access to Hetch Hetchy's cliffs is impractical due to limited visiting hours and paucity of trails. Above: World Champion climber Hans Florine with Jayme Moye and Fiona Thornewell atop Yosemite's El Capitan. (Photo by Steve Rokks)

The recreational value associated with these visitors is broken down into three parts:

- The amount of money visitors would spend inside Yosemite National Park;
- The amount of money visitors would spend outside Yosemite National Park; and
- The consumer surplus associated with each trip (i.e. a visitor's willingness-to-pay, ***over and above*** what they actually do pay for the experience).

Total consumer surplus and spending associated with a restored Hetch Hetchy Valley would likely fall in the range of $2 to $6 billion in value over 50 years (discounted at 3 percent). The lower use value scenarios would correspond to more overall protection and conservation of the area, which could equate to higher per-trip values and greater passive use existence values. Figure ES-2 provides the projected total recreational benefits under each scenario defined above.

FIGURE ES-2 THE PROJECTED TOTAL RECREATIONAL BENEFITS



PASSIVE VALUE OF A RESTORED HETCH HETCHY VALLEY

The passive, or non-use, value of a natural resource is separated from the recreational values described above. This value includes:

- **OPTION VALUE** — the value placed on individual willingness to pay for maintaining an asset or resource, given the possibility that it may someday be used;
- **BEQUEST VALUE** — values placed on individual willingness to pay for maintaining or preserving an asset or resource so that it is available for future generations; and
- **EXISTENCE VALUE** — the benefit people receive from knowing that a particular environmental resource, such as Antarctica, the Grand Canyon, and endangered species, exists.

Passive-use valuations are common in academic literature and are supported by the U.S. Department of the Interior, which explains that:

> *"... an injury to a common natural resource with many substitutes (e.g., a typical small stream), may not generate large non-use values, particularly for those residing outside the area where the injury occurred, even if the recovery takes a long time. However, a **permanent injury to a unique resource** (e.g., the Grand Canyon) may generate significant non-use values, even for those residing in areas far removed geographically from the site where the injury occurred."*

Consistent with restoration of other natural resources in the western United States, the restoration of Hetch Hetchy Valley is projected to have a high passive-use value. Communities would value restoration beyond the ability to recreate. The option of recreation, having it available for their families or simply knowing it is there, provides significant value.

The pending dam removal on the Klamath River to restore fisheries is an example of the restoration efforts found to have a substantial willingness-to-pay among people with no plans to visit. (Courtesy of BLMOregon)

No original passive use data were collected for this study. Rather it references studies associated with other western landscapes and collected over the last several decades for representative willingness-to-pay values for comparable resources and improvements. These studies include analysis related to the following programs:

- Klamath Basin Restoration, 2012
- Elwha and Glines Dam Removal, 1996
- National Park Visibility Preservation, 1990
- Mono Lake Preservation, 1987
- Grand Canyon Flow Augmentation, 1999
- South Platte River Restoration, 2000

	Klamath Basin Restoration (Mansfield et al. 2012)	Mono Lake Preservation (Loomis 1987)	Grand Canyon Flow Augmentation (Welsh et al. 1999)	Elwha and Glines Dam Removal (Loomis 1996)	South Platte River Restoration (Loomis et al. 2000)	National Park Visibility Preservation (Welsh et al. 1999)
Local Annual HH WTP*	$133	Not surveyed	40-$52	$96	$381	$50
Statewide Annual HH WTP	$233	$334	Not surveyed	$118	Not surveyed	$50
U.S. Annual HH WTP	$233	Not surveyed	$25-$37	$110	Not surveyed	$34
Total Annual Benefits	$3.3-$5.7 billion[1]	$3.5-$7.9 billion[2]	$4.1-$6.2 billion[3]	$3.1-$6.2 billion	$28-$107 million	Not reported
Illustrative PV Over 20 Years, 3% Discount Rate	$90 billion[1]	$53-$118 billion[2]	$39-$54 billion[3]	$46-$93 billion	$420 million-$1.6 billion[4]	$55 to $75 billion

*Willingness-to-pay values are averages, based on survey data and do not show that all respondents would value restoration the same. Some would assign zero value, while others would have a higher-that average willingness-to-pay.

OVERALL SUMMARY AND CONCLUSIONS

The historical, geographical, scenic, and natural characteristics of Hetch Hetchy Valley suggest that restoration would generate substantial demand to visit, recreate, study, and generally enjoy the area. Furthermore, these characteristics in consideration of several comparable studies regarding passive-use values suggest that restoration would also be valuable to a large portion of the general public across California and the United States as a whole, even if they do not expect to visit.

The data, studies, and analyses described in this report suggest that restoring Hetch Hetchy Valley would provide benefits worth many billions of dollars to society. Net economic benefits (consumer surplus) of recreational use would likely be $1.5 to $3 billion and at the high trip values and without discounting, up to $9 billion. Total gross economic use value when including these expenditures, climbs to $2 to $5 billion or $16.5 billion without discounting and the high trip values. When including passive-use values, quantifiable total economic values for restoring Hetch Hetchy could expand deeper into the $10s of billions when considering just California households, or $100 billion when considering national households. Passive-use values of a restored Hetch Hetchy Valley would likely accrue to people outside of the United States as well.

This study by ECONorthwest makes a convincing case that there could be substantial economic benefits if Hetch Hetchy were to be restored, including recreation benefits for millions of visitors from California and elsewhere. They would be attracted by the same types of recreation opportunities as at Yosemite, but with less congestion. In addition, others who might not themselves visit would place significant economic value on the restoration of an iconic element in California's environmental heritage.

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Parts of Yosemite Valley can be crowded, especially in summer, but it is still possible to find relative solitude. The same would be true in a restored Hetch Hetchy Valley. (Courtesy of Unsplash. Photo by Jordan Pulmano.)

Park visitors (left) rest near Rancheria Falls, a site accessible only to those able to do 9-mile hike around the north side of Hetch Hetchy Reservoir. From a restored valley, the walk to Rancheria Falls would be less than one mile. (Photo by @she_explores)