



## Nature's Benefits from Your National Forests

The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

The Agency's 154 national forests and 20 grasslands engage in quality land management that offers multi-use opportunities to meet the diverse needs of people. Forest ecosystems are human, plant, and animal life-support systems that provide a suite of goods and services vital to human health and

livelihood—essentially Nature's Benefits, also called Ecosystem Services. Benefits from healthy forest ecosystems include: water supply, filtration and regulation (flood control); habitat for native wildlife and plants; carbon sequestration; jobs, commerce, and value to local economies; recreational opportunities and open space for communities; increased physical and psychological wellness; cultural heritage; wood and other non-timber forest products; energy; clean air; and pollination.

### Do You Know Which Nature's Benefits Come from the Modoc National Forest?

**Water:** In drought-prone California, the quantity, quality, and timely provision of our water is dependent on the health of our national forests. The forests supply, filter, and regulate water from upper watersheds and meadows, providing clean water throughout the year to communities, homes, and wildland habitats. Water also helps support jobs and industries that are water-dependent.

- About 591,000 acre-feet of water per year come from the Modoc National Forest<sup>1</sup>
  - Or over 192 billion gallons per year

**SOURCES**

<sup>1</sup>Brown et al., 2016- Mean annual renewable water supply of the Contiguous United States. <https://www.fs.fed.us/rmrs/documents-and-media/really-mean-annual-renewable-water-sup-ply-contiguous-united-states>  
<sup>2</sup>Per the National Health and Nutrition Examination Surveys, the average American consumes ~299 gallons/year of water, through both drink and food <sup>3</sup>Assuming 362 gallons/day - <http://www.irwd.com/images/pdf/save-water/CaSingleFamilyWaterUseEfficiencyStudyJune2011.pdf>  
<sup>4</sup>Using CA water market prices, appropriated by sector - [https://www.fs.fed.us/rm/value/docs/marginal\\_economic\\_value\\_streamflow\\_forests.pdf](https://www.fs.fed.us/rm/value/docs/marginal_economic_value_streamflow_forests.pdf) <sup>5</sup>100 gallons/day + monthly water bill of ~\$100.14 - <http://www.circleofblue.org/waterpricing/>

*That equates to:*

- Over 290,000 Olympic-size swimming pools
- Enough drinking water for California's population for more than 16 years<sup>2</sup>, or
- Enough water for over 1.4 million households for a year<sup>3</sup>

*How much is 192 billion gallons worth?*

- Estimated wholesale market value: over \$55 million<sup>4</sup>
- Cost to Los Angeles households: over \$6.3 billion<sup>5</sup>



# Nature's Benefits

Modoc National Forest

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**Carbon:** The National Forests of California play an important role in parts of the climate cycle; acting as carbon storage and sequestration units. Forests retain carbon from being emitted to, and absorb carbon dioxide (CO<sub>2</sub>) from, the atmosphere, which helps reduce the impacts of a warming climate to human, plant and animal habitats.



- The Modoc National Forest stores about 78.86 Million Metric Tons (MMT) of Carbon in its forest<sup>6</sup>
- Sequesters on average 0.12 MMTC annually; this equates to enough to drive around the earth 42,718 times.

**Local Economies:** The economy of California is fifth largest in the world, and California's National Forests contribute almost \$2.6 billion annually in wages and income to small businesses,<sup>7</sup> a critical component of the rural economy of the state.



*The Modoc National Forest supports:*

- About \$41.1 million annually in labor income for wage earners and local businesses<sup>8</sup>
  - Including food and lodging services, arts, entertainment and recreation, real estate, rental and leasing, and retail trade services.
- About 1,030 jobs annually<sup>9</sup>

**Recreation:** The Modoc National Forest provides a place for people to find open space, experience wildlife, recreate, relax, and otherwise remove themselves from the stressors of everyday life and urban sprawl.



Many methods exist to calculate the benefits from recreation and the value of those benefits to visitors and local economies. The following provide some estimations of those values:

- Over 146,000 people visit the Modoc National Forest to recreate annually, which represents an economic value of over \$11 million to those visitors<sup>10</sup>
- Visitors to the Modoc National Forest spend about \$9.2 million during their trips<sup>11</sup>
- Visitors to the Modoc National Forest contribute more than \$3.4 million towards wages and income of local businesses<sup>12</sup>

The Modoc National Forest landscape includes diverse recreation opportunities such as water recreation (fishing, swimming, and rafting) as well as camping, picnicking, and green space for activities that support human wellness and cultural traditions.<sup>13</sup>

- 1,850 lakes and ponds
- 3,905 miles of rivers and streams
- 156 miles of trails

## SOURCES

<sup>6</sup><https://bofdata.fire.ca.gov/projects-and-programs/ab-1504/>

<sup>7, 8, 9</sup>Job and Income Contributions for 2014-At A Glance-Region, <https://www.fs.fed.us/emc/economics/contributions/at-a-glance.shtml>

<sup>10</sup>NVUM, R5 Calculations based on GTR-957 – Rosenburger et al., 2017 - <https://www.fs.usda.gov/treearch/pubs/54602>

<sup>11</sup>R5 Calculations based on GTR-961 – White, 2017- [https://www.fs.fed.us/pnw/pubs/pnw\\_gtr961.pdf](https://www.fs.fed.us/pnw/pubs/pnw_gtr961.pdf)

<sup>12</sup><https://www.fs.fed.us/emc/economics/contributions/at-a-glance.shtml>

<sup>13</sup>Enterprise Data Warehouse



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- 70,250 acres of wilderness
- 31 developed campgrounds
- 3 developed picnic areas

People visit their National Forests to engage in specific activities that provide value to them from their experiences as shown below:

- Over 24,000 people visit the Modoc National Forest annually to hunt and fish as their main activity, which represents an economic value of over \$2.1 million to those visitors.<sup>14</sup>
- Over 21,000 people visit the Modoc National Forest annually to engage in camping and backpacking as their main activity, which represents an economic value of over \$1.7 million to those visitors.<sup>15</sup>
- Over 6,000 visit the Modoc National Forest annually to go hiking and walking as their main activity, which represent an economic value over \$500,000 to those visitors.<sup>16</sup>

**Habitat:** Forest Habitats and Biodiversity are key to ecological function; a forest's daily function in turn allows all of Nature's Benefits, from water to recreation, to continue to be provided for humans to enjoy.

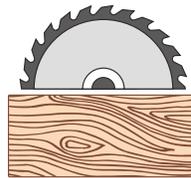


The Modoc National Forest hosts a multitude of key habitats for animals and plants.

- 10 Threatened and Endangered Species can be found on the Modoc National Forest that include: shortnose sucker, Lost River sucker, Gray wolf, western Yellow-billed cuckoo, northern spotted owl, Greene's tuctoria.<sup>17</sup>

- 203 meadows<sup>18</sup>

**Timber & Wood Products:** Wood harvested from California's National Forests support forest health, jobs, and provide products for everyday use.



On average for Fiscal Years 2017, 2018 & 2019, the Modoc National Forest:

- Sold about 26,703 thousand board feet (MBF) of Timber<sup>19</sup>, and
- Cut approximately 16,051 (MBF) of Timber, annually<sup>20</sup>

This cut timber has an estimated value of over \$5.8 million<sup>21</sup>:

- Produced about 9,644 (MBF) of lumber, and is
  - Worth over \$3.8M
- Produced over 18,000 bone dry tons of wood for biomass energy, and is
  - Enough to power over 2,573 homes for the year, and
  - Worth almost \$2 million

## SOURCES

<sup>14</sup>, <sup>15</sup>, <sup>16</sup>R5 Calculations based on GTR-957 – Rosenburger et al., 2017 - <https://www.fs.usda.gov/treesearch/pubs/54602>

<sup>17</sup>Master R5 TE Species List 20191016; <https://ecos.fws.gov/ipac/>

<sup>18</sup>UC Davis, Center for Watershed Sciences & USDA Forest Service, Pacific Southwest Region, 2017. Sierra Nevada Multi-Source Meadow Polygons Compilation (v 2.0), Vallejo, CA, Regional Office: USDA Forest Service. 2017. <http://meadows.ucdavis.edu/>

<sup>19</sup>PTSAR Reports: <https://www.fs.fed.us/forestmanagement/products/ptsar/index.shtml>

<sup>20</sup>Cut/Sold reports: <https://www.fs.fed.us/forestmanagement/products/cut-sold/index.shtml>

<sup>21</sup>R5 analysis based on cut-sold report and McIver et al., 2015 - [https://www.fs.fed.us/pnw/pubs/pnw\\_gtr908.pdf](https://www.fs.fed.us/pnw/pubs/pnw_gtr908.pdf)



# Nature's Benefits

Modoc  
National Forest

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- In addition, the Modoc National Forest:
  - Sold about 8,200 cords of firewood, worth over \$22,092
  - Sold 552 Christmas trees, worth over \$4,667

## DID YOU KNOW?

- The Modoc National Forest hosts the largest wild horse herd and Wild Horse Territory in the Forest Service offering visitors numerous opportunities to spot horses in the wild, and is one more reason to connect with their national forest.
- The Warner Mountains, located in the far northeasternmost corner of California, capture precipitation for the Sacramento watershed and the ultimate headwaters of the Pit River, which is one of only three rivers passing through the Cascade Mountains.