BUTTE COUNTY FOREST ADVISORY COMMITTEE

May 18, 2015 - 4:00 P.M.

ITEM NO.

1.00	Call to order – Auditor-Treasurer Conference Room, 25 County Center Drive, Oroville
2.00	Pledge of allegiance to the Flag of the United States of America (if American flag is present)
2.01	Roll Call - Invited Guests: Randy Gould, (District Ranger, Plumas NF)

3.00	**Consent Agenda**
3.01	Review and approve minutes of 4-27-15
4.00	**Agenda**
4.01	Self-Introduction of Forest Advisory Committee Members, Alternates, Guests and Public – 5 Min.
4.02	SOPA Review – Current Quarter: Discussion & required FAC action for projects affecting Butte County listed in 2015 SOPA Reports for Lassen and Plumas NF's-Chair Stewart – 15 Min.
4.03	National Visitor Use Monitoring Program as it relates to Lassen and Plumas National Forests – Shary – 15 Min.
4.04	Chico Velo – Thad Walker and Bicycle Trails/Tourism – discussion (Shary/Faulkner) – 5 Min.
4.05	Update – OHV Grant(s) – Moak (Peggy)
4.06	Workshop - Forest roads/recreational needs: FAC to come up with a proposed plan for Coordinating Committee to work with, in preparation for a coordination session with the Plumas and Lassen NF. Considerations: Motorized and non-motorized recreation, access to trailheads, staging areas for horses, motorcycles, OHV. Protection of meadows, streams and other sensitive areas.
4.07	New Business – considerations for next meeting agenda: • Road planning session – formalization of plan to be proposed by CC • Discuss July meeting (Peg will be gone on vacation!) •
4.08	Public Comment (THE COMMITTEE IS PROHIBITED BY STATE LAW FROM TAKING ACTION ON ANY ITEM PRESENTED IF IT IS NOT LISTED ON THE AGENDA.)
4.10	Discussion item: Next meeting will be Monday, June 22, 2015, at 6:00 PM – Chico, at the Public Works Facility on Bellarmine Ct.

Moak, Peggy

From: BCRCD RCD <bc-rcd@carcd.org>
Sent: Wednesday, May 13, 2015 10:39 AM
To: Vance Severin
Cc: Moak, Peggy; Crump, Mike; Carl E. Harland
Subject: Re: OHV Grant

Good Morning Peggy,

We have over 1,200 OHV Volunteer hours as of now. I have another volunteer group going out this weekend. I expect OHV volunteer hours will be well over by 1,500 next week! there are just a few roads left that haven't been looked at. the County and Forest Service will start working on roads in the near future in the French Creek Area. This summer I would like to have a work group day were we replace signs and trail markers. We still have about 30 days or until we will know about next years grant.

Thanks,

Sarah Reynolds
Butte County Resource Conservation District
(530)534-0112 ext 122

On Wed, May 13, 2015 at 10:26 AM, Vance Severin <mrshred@sbcglobal.net> wrote:

> Hi Peggy,
>
> The Paradise Ridge Riders did a road assessment day for the current grant on April 11, we broke up into several groups to assess roads in individual project areas. By all accounts everyone had a good time and a substantial number of roads were assessed. This is in addition to the day Jim Shary and I spent assessing roads in the Four Trees/Big Bar Mountain Rd area in March. Sarah Reynolds at the RCD may have better data on total volunteer hours and miles assessed.
>
> Vance
>
> On Wednesday, May 13, 2015 10:12 AM, "Moak, Peggy" <pmoak@buttecounty.net> wrote:
>
> Good morning, Mike and Vance:
>
> Do you have any update on the status of the two OHV Grants? (The approved grant, and the application for next year's grant) If so, I'd like to include it on the agenda.
>
> The agenda will be posted this afternoon, so your earliest response would be appreciated.
>
> Thanks,
>
> PEGGY MOAK
> **TREASURER-TAX COLLECTOR**

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United States Department of Agriculture

Forest Service

Natural Resource Manager

National Visitor Use Monitoring Program

Last updated:
24 January 2015

Visitor Use Report

Lassen NF

USDA Forest Service
Region 5

National Visitor Use Monitoring
Data collected FY 2010

CONTENTS

1. INTRODUCTION

1.1. Scope and purpose of the National Visitor Use Monitoring program

The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visitors to national forest system managed lands at the national, regional, and forest level. Information about the quantity and quality of recreation visits is required for national forest plans, Executive Order 12862 (Setting Customer Service Standards), and implementation of the National Recreation Agenda. To improve public service, the agency's Strategic and Annual Performance Plans require measuring trends in user satisfaction and use levels. NVUM information assists Congress, Forest Service leaders, and program managers in making sound decisions that best serve the public and protect valuable natural resources by providing science based, reliable information about the type, quantity, quality and location of recreation use on public lands. The information collected is also important to external customers including state agencies and private industry. NVUM methodology and analysis is explained in detail in the research paper entitled: Forest Service National Visitor Use Monitoring Process: Research Method Documentation; English, Kocis, Zarnoch, and Arnold; Southern Research Station; May 2002 (http://www.fs.fed.us/recreation/programs/nvum).

In 1998 a team of research scientists and forest staff developed a recreation sampling system (NVUM) that provides statistical recreation use information at the forest, regional, and national level. Several Forest Service staff areas including Recreation, Wilderness, Ecosystem Management, Research and Strategic Planning and Resource Assessment were involved in developing the program. From January 2000 through September 2003 every national forest implemented this methodology and collected visitor use information. This application served to test the method over the full range of forest conditions, and to provide a rough national estimate of visitation. Implementation of the improved method began in October 2004. Once every five years, each National Forest and Grassland has a year of field data collection.

This NVUM data is useful for forest planning and decision making. The description of visitor characteristics (age, race, zip code, activity participation) can help forest staff identify their recreation niche. Satisfaction information can help management decide where best to place limited resources that would result in improved visitor satisfaction. Economic expenditure information can help forests show local communities the employment and income effects of tourism from forest visitors. In addition, the visitation estimates can be helpful in considering visitor capacity issues.

1.2. Methods

To define the sampling frame, staff on each forest classify all recreation sites and areas into five basic categories called "site types": Day Use Developed Sites (DUDS), Overnight Use Developed Sites (OUDS), Designated Wilderness Areas (Wilderness), General Forest Areas (GFA), and View Corridors (VC). Only the first four categories are counted as national forest recreation visits and are included in the visit estimates. The last category is used to track the volume of people who view national forests from nearby roads; since they do not get onto agency lands, they cannot be counted as visits. For the entire sampling year, each day on each site was given a rating of very high, high, medium, low, or no use according to the expected level of recreational visitors who

would be observed leaving that location for the last time (last exiting recreation use) on that day. The combination of a calendar day and a site or area is called a site day. Site days are the basic sampling unit for the NVUM protocol. Results of this forest categorization are shown in Table 1.

In essence, visitation is estimated through a combination of traffic counts and surveys of exiting visitors. Both are obtained on a random sample of locations and days distributed over an entire forest for a year. All of the surveyed recreation visitors are asked about their visit duration, activities, demographics, travel distance, and annual usage. About one-third were also asked a series of questions about satisfaction. Another one-third were asked to provide information about their income, spending while on their trip, and the next best substitute for the visit.

1.3. Definition of Terms

NVUM has standardized measures of visitor use to ensure that all national forest visitor measures are comparable. These definitions are basically the same as established by the Forest Service in the 1970's. Visitors must pursue a recreation activity physically located "on" Forest Service managed land in order to be counted. They cannot be passing through; viewing from non-Forest Service managed roads, or just using restroom facilities. The visitation metrics are ***national forest visits*** and ***site visits.*** NVUM provides estimates of both and confidence interval statistics measuring the precision of the estimates. The NVUM methodology categorizes recreation facilities and areas into specific site types and use levels in order to develop the sampling frame. Understanding the definitions of the variables used in the sample design and statistical analysis is important in order to interpret the results.

National forest visit is the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A national forest visit can be composed of multiple site visits. The visit ends when the person leaves the national forest to spend the night somewhere else.

Site visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time. The site visit ends when the person leaves the site or area for the last time on that day.

A ***confidence interval*** is a range of values that is likely to include an unknown population value, where the range is calculated from a given set of sample data. Confidence intervals are always accompanied by a ***confidence level***, which tells the degree of certainty that the value lies in the interval. Used together these two terms define the reliability of the estimate, by defining the range of values that are needed to reach the given confidence level. For example, the 2008 national visitation estimate is 175.6 million visits, with a 90% confidence interval of 3.2%. In other words, given the NVUM data, our best estimate is 175.6 million visits, and given the underlying data, we are 90% certain that the true number is between 170.0 million and 181.2 million.

Recreation trip is the duration of time beginning when the visitor left their home and ending when they return to their home.

Site day - a day that a recreation site or area is open to the public for recreation purposes.

Proxy - information collected at a recreation site or area that is directly related to the amount of

recreation visitation received. The proxy information must pertain to all users of the site and it must be one of the proxy types allowed in the NVUM pre-work directions (fee receipts, fee envelopes, mandatory permits, permanent traffic counters, group reservations, ticket sales, and daily use records).

Nonproxy - a recreation site or area that does not have proxy information. At these sites a 24-hour traffic count is taken to measure total use for one site day at the sample site.

Use level - for each day of the year for each recreation site or area, the site day was categorized as very high, high, medium or low last exiting recreation traffic, or no exiting use. No Use could means either that the location was administratively closed, or it was open but was expected to have zero last exiting visitors. For example a picnic area may listed as having no use during winter months (120 days), high last exiting recreation volume on all other weekends (70 days) and medium last exiting recreation use on the remaining midweek days (175 days). This accounts for all 365 days of the year. This process was repeated for every site and area on the forest.

1.4. Limitations of the Results

The information presented here is valid and applicable at the forest, regional, and national level. It is not designed to be accurate at the district or site level. The quality of the visitation estimate is dependent on the sample design development, sampling unit selection, sample size and variability, and survey implementation. First, preliminary work conducted by forests to identify and consistently classify sites and access points according to the type and amount of expected exiting visitation is the key determinant of the validity and magnitude of the visitation estimate. Second, the success of the forest staff in accomplishing its assigned set of sample days, correctly filling out the interview forms, and following the field protocols influence the reliability of the results, variability of the visitation estimate, and validity of the visitation descriptions. Third, the variability of traffic counts within a sampling stratum affects the reliability of the visitation estimates. Fourth, the range of visitors sampled must be representative of the population of all visitors. Finally, the number of visitors sampled must be large enough to adequately control variability. The results and confidence intervals will reflect all these factors.

Confidence intervals indicate the reliability of the visitation estimate, given the underlying data. Large confidence intervals indicate high variability in the national forest visit (NFV), site visit (SV) and Wilderness visit estimates. Variance is caused primarily by a small sample size in number of days or having a few sampled days where the observed exiting visitation volume was very different from the normal range. For example, on a particular National Forest in the General Forest Area low stratum, there were 14 sample days. Of these 14 sample days, 13 days had visitation estimates between zero and twenty. The remaining day had a visitation estimate of 440. So the stratum mean was about 37 per day, standard error was about 116, and the 90% confidence interval width is 400% of the mean. Causes for such outlier observations are not known, but could include a misclassification of the day (a high use day incorrectly categorized as a low use day), unusual weather, malfunctioning traffic counter, or reporting errors. Eliminating the unusual observation from data analysis would reduce the variability. However, unless the NVUM team had reason to suspect the observation was incorrect they did not eliminate these unusual cases.

The descriptive information about national forest visitors is based upon only those visitors that were interviewed. Every effort was made to incorporate distinct seasonal use patterns and activities that

vary greatly by season into the sampling frame. The sampling plan took into account both the spatial and seasonal spread of visitation patterns across the forest. Even so, because of the small sample size of site-days, or because some user groups decline to participate in the survey, it is possible to under-represent certain user groups, particularly for activities that are quite limited in where or when they occur.

Note that the results of the NVUM activity analysis DO NOT identify the types of activities visitors would like to have offered on the national forests. It also does not tell us about displaced forest visitors, those who no longer visit the forest because the activities they desire are not offered.

Some forest visitors were counted and included in the total forest use estimate but were not surveyed. This included visitors to recreation special events and organization camps. Their characteristics are not included in the visit descriptions.

Caution should be used in interpreting any comparisons of these results with those obtained during the 2000 - 2003 period. Differences cannot be interpreted as a trend. Several method changes account for the differences, for both visitation estimates and visit characteristics. One key factor is that the first application of the NVUM process was largely a national beta-test of the method, and significant improvements occurred following it. The NVUM process entailed a completely new method and approach to measuring visitation on National Forest lands. Simply going through the NVUM process for the first time enabled forest staff to do a much better job thereafter in identifying sites, accurately classifying days into use level strata, and ensuring consistency across all locations on the forest. These improvements enhanced the validity of all aspects of the NVUM results. Sampling plans and quality control procedures were also improved.

2. VISITATION ESTIMATES

2.1. Forest Definition of Site Days

The population of site days for sampling was constructed from information provided by forest staff. For each site, each day of the year was given a rating of very high, high, medium, low, or none according to the expected volume of recreation visitors who would be leaving the site or area for the last time (last exiting recreation use). The stratum, a combination of site type and use level, was then used to construct the sampling frame. The results of the recreation site/area stratification and days sampled are displayed in Table 1.

Table 1. Site Days and Percentage of Days Sampled by Stratum

Stratum*		Days Sampled	Site Days# in Use Level/Proxy Population	Sampling Rate (%)&
Site Type†	Use Level‡ or Proxy Code§			
DUDS	VERY HIGH	13	175	7.4
DUDS	HIGH	16	513	3.1
DUDS	MEDIUM	16	880	1.8
DUDS	LOW	17	1,546	1.1
OUDS	MEDIUM	9	37	24.3
OUDS	LOW	11	1,577	0.7
OUDS	DUR4	13	3,316	0.4
OUDS	DUR5	8	729	1.1
GFA	HIGH	17	712	2.4
GFA	MEDIUM	17	1,908	0.9
GFA	LOW	32	10,147	0.3
WILDERNESS	HIGH	10	130	7.7
WILDERNESS	MEDIUM	10	528	1.9
WILDERNESS	LOW	19	2,102	0.9
Total		**208**	**24,300**	**0.9**

* Stratum is the combination of the site type and use level or proxy code. Sample days were independently drawn within each stratum.

† DUDS = Day Use Developed Site, OUDS = Overnight Use Developed Site, GFA = General Forest Area (“Undeveloped Areas”), WILDERNESS = Designated Wilderness

‡ Use level was defined independently by each forest by defining the expected number of recreation visitors that would be last-exiting a site or area on a given day. The forest developed the range for very high, high, medium, and low and then assigned each day of the year to one of the use levels.

§ Proxy Code - If the site or area already had counts of use (such as fee envelopes or ski lift tickets) the site was called a proxy site and sampled independent of nonproxy sites.

Site Days are days that a recreation site or area is open to the public for recreation purposes.

& 0.0 - This value is less than five one-hundredths.

2.2. Visitation Estimates

Visitation estimates are available at the national, regional, and forest level. This document provides only National Forest level data. Other documents may be obtained through the National Visitor Use Monitoring web page: www.fs.fed.us/recreation/programs/nvum.

When reviewing the results, users should discuss with forest staff if this forest experienced any unusual circumstances such as forest fires, floods, or atypical weather that may have created an unusual recreation use pattern for the year sampled. Table 2 displays the number of national forest visits and site visits by site type for this National Forest.

Table 2. Annual Visitation Estimate

Visit Type	Visits (1,000s)	90% Confidence Level (%)#
Total Estimated Site Visits*	421	±29.8
→ Day Use Developed Site Visits	117	±26.1
→ Overnight Use Developed Site Visits	79	±14.9
→ General Forest Area Visits	222	±54.5
→ Designated Wilderness Visits†	3	±32.7
Total Estimated National Forest Visits§	300	±36.4
→ Special Events and Organized Camp Use‡	4	±0.0

* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Designated Wilderness visits are included in the Site Visits estimate.

‡ Special events and organizational camp use are not included in the Site Visit estimate, only in the National Forest Visits estimate. Forests reported the total number of participants and observers so this number is not estimated; it is treated as 100% accurate.

§ A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

This value defines the upper and lower bounds of the visitation estimate at the 90% confidence level, for example if the visitation estimate is 100 +/-5%, one would say “at the 90% confidence level visitation is between 95 and 105 visits.”

The quality of the use estimate is based in part on how many individuals were contacted during the sample day and how many complete interviews were obtained from which to estimate NVUM numbers and visitor descriptions. Table 3 and Table 4 display the number of visitor contacts, number of completed interviews by site type and survey form type. This information may be useful to managers when assessing how representative of all visitors the information in this report may be.

Table 3. Number of Individuals Contacted by Site Type

Site Type	Total Individuals Contacted	Individuals Who Agreed to be Interviewed	Recreating Individuals Who Are Leaving for the Last Time That Day
Day Use Developed Sites	837	743	233
Overnight Use Developed Sites	472	422	79
Undeveloped Areas (GFAs)	360	333	74
Designated Wilderness	21	21	15
Total	**1,690**	**1,519**	**401**

Table 4. Number of Complete Interviews* by Site Type and Form Type

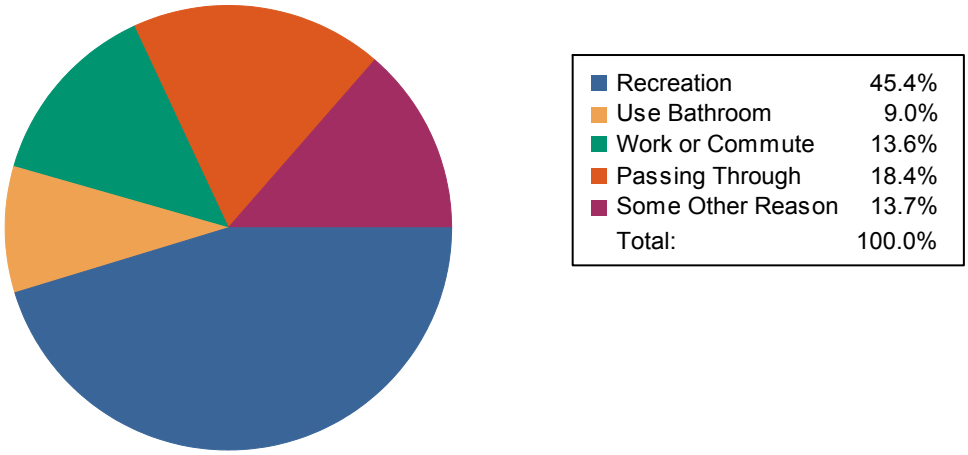
Form Type†	Developed Day Use Site	Developed Overnight	Undeveloped Areas (GFAs)	Wilderness	Total
Basic	75	26	28	5	134
Economic	75	24	27	7	133
Satisfaction	83	29	19	3	134
Total	**233**	**79**	**74**	**15**	**401**

* Complete interviews are those in which the individual contacted agreed to be interviewed, was recreating on the national forest and was exiting the site or area for the last time that day.

† Form type is the type of interview form administered to the visitor. The Basic form did not ask either economic or satisfaction questions. The Satisfaction form did not ask economic questions and the Economic form did not ask satisfaction questions.

Visitors were interviewed regardless of whether they were recreating at the site or not, however the interview was discontinued after determining that the reason for visiting the site was not recreation. Figure 1 displays the various reasons visitors gave as their purpose for stopping at the sample site.

Figure 1. Purpose of Visit by Visitors Who Agreed to be Interviewed



3. DESCRIPTION OF THE RECREATION VISIT

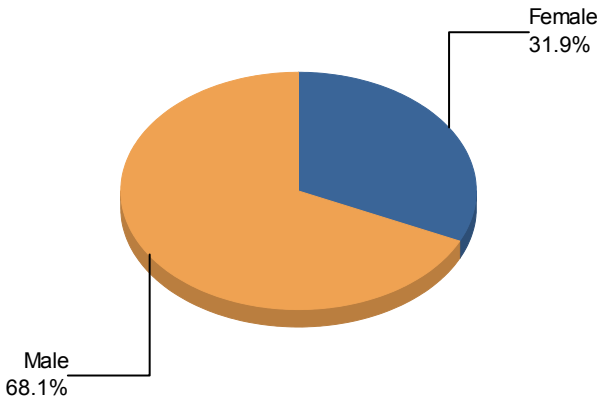
3.1. Demographics

Descriptions of forest recreational visits were developed based upon the characteristics of interviewed visitors (respondents) and expanded to the national forest visitor population. Basic demographic information helps forest managers identify the profile of the visitors they serve. Management concerns such as providing recreation opportunities for underserved populations may be monitored with this information. Table 5, Table 6 and Table 7 provide basic demographic information about visitors interviewed regarding Gender, Race/Ethnicity, and Age, respectively. Table 8 shows the 15 most common reported origins for recreation visitors. A complete list of reported zip codes for respondents is found in Appendix A. Table 9 provides information about self reported travel distance from home to the interview site.

Demographic results show that slightly less than one-third of visits are made by females. The most numerous racial or ethnic minorities in the visiting population are Hispanics (5%) and Asian (2.6%). Children under the age of 16 account for a bit more than 25 percent of visits. About 21 percent are people aged 60 and older. The Lassen serves a largely local client base. Over 43 percent of visits come from people living within 50 miles of the forest ; another 7 percent come from 50 to 75 miles away.

Table 5. Percent of National Forest Visits* by Gender

Gender	Survey Respondents†	National Forest Visits (%)‡
Female	350	31.9
Male	556	68.1
Total	**906**	**100.0**



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

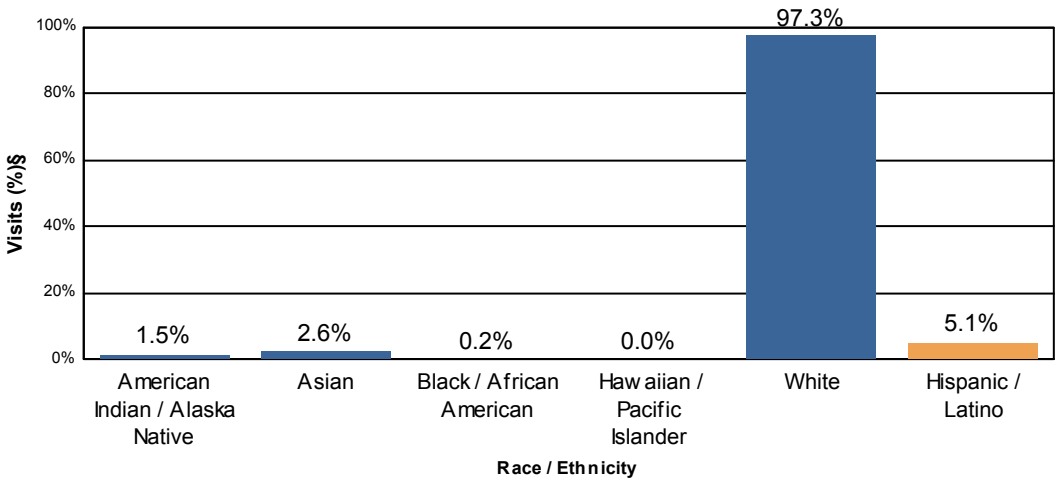
† Non-respondents to gender questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 6. Percent of National Forest Visits* by Race/Ethnicity

Race †	Survey Respondents‡	National Forest Visits (%)§
American Indian / Alaska Native	12	1.5
Asian	8	2.6
Black / African American	2	0.2
Hawaiian / Pacific Islander	1	0.0
White	340	97.3
Total	363	101.6#

Ethnicity†	Survey Respondents‡	National Forest Visits (%)§
Hispanic / Latino	11	5.1



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

Respondents could choose more than one racial group, so the total may be more than 100%.

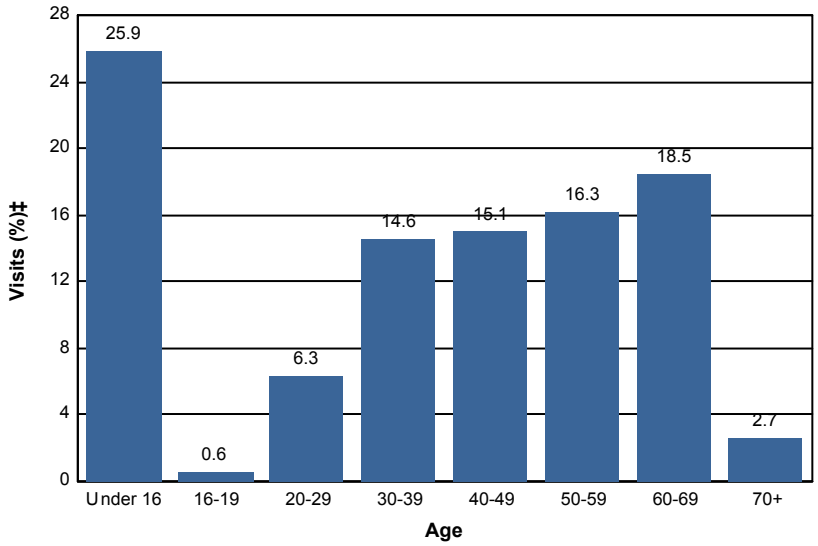
† Race and Ethnicity were asked as two separate questions.

‡ Non-respondents to race/ethnicity questions were excluded from analysis.

§ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 7. Percent of National Forest Visits* by Age

Age Class	National Forest Visits (%)‡
Under 16	25.9
16-19	0.6
20-29	6.3
30-39	14.6
40-49	15.1
50-59	16.3
60-69	18.5
70+	2.7
Total	**100.0**



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Non-respondents to age questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 8. Top 15 Most Commonly Reported ZIP Codes, States and Counties of National Forest Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
96130	California	Lassen County	17.6	27
96080	California	Tehama County	8.5	13
96002	California	Shasta County	7.8	12
96007	California	Shasta County	7.8	12
95973	California	Butte County	6.5	10
96022	California	Shasta County	6.5	10
96001	California	Shasta County	6.5	10
96020	California	Plumas County	6.5	10
95926	California	Butte County	5.2	8
96114	California	Lassen County	5.2	8
96088	California	Shasta County	4.6	7
96137	California	Lassen County	4.6	7
95928	California	Butte County	4.6	7
Unknown Origin*			3.9	6
96003	California	Shasta County	3.9	6

* Includes respondents reporting no ZIP code or an invalid ZIP code.

Table 9. Percent of National Forest Visits* by Distance Traveled

Miles from Survey Respondent's Home to Interview Location†	National Forest Visits (%)
0 - 25 miles	18.3
26 - 50 miles	24.8
51 - 75 miles	6.5
76 - 100 miles	10.6
101 - 200 miles	15.1
201 - 500 miles	16.4
Over 500 miles	8.3
Total	100.0

Note: Blank cells indicate that insufficient data were collected to make inferences.

* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Travel distance is self-reported.

3.2. Visit Descriptions

Characteristics of the recreation visit such as length of visit, types of sites visited, activity participation and visitor satisfaction with forest facilities and services help managers understand recreation use patterns and use of facilities. This allows them to plan workforce and facility needs. The average national forest visit length of stay and average site visit length of stay by site type on this forest is displayed in Table 10. Since the average values displayed in Table 10 may be influenced by a few people staying a very long time, the median value is also shown.

Most of the national forest visits to the Lassen are short. About half last 6 hours or less. However, there are a number of longer visits, since the average visit duration is almost 33 hours. Eighty-six percent of the visits involve going to only one place on the Lassen for recreation during a visit. Despite a mostly local customer base, there are not many frequent users. Nearly sixty percent of all visits come from people who visit at most 5 times per year. Not even ten percent come from people show visit more than 50 times per year.

Table 10. Visit Duration

Visit Type	Average Duration (hours)‡	Median Duration (hours)‡
Site Visit	15.5	3.8
Day Use Developed	2.7	1.6
Overnight Use Developed	43.2	43.5
Undeveloped Areas	10.7	3.8
Designated Wilderness	10.9	4.8
National Forest Visit	32.6	6.5

* A Site Visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time. Sites and areas were divided into four site types as listed here.

† A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

‡ If this variable is blank not enough surveys were collected to make inferences.

Many of the respondents on this National Forest went only to the site at which they were interviewed (Table 11). Some visitors went to more than one recreation site or area during their national forest visit and the average site visits per national forest visit is shown below. Also displayed are the average people per vehicle and average axles per vehicle. This information in conjunction with traffic counts was used to expand observations from individual interviews to the full forest population of recreation visitors. This information may be useful to forest engineers and others who use vehicle counters to conduct traffic studies.

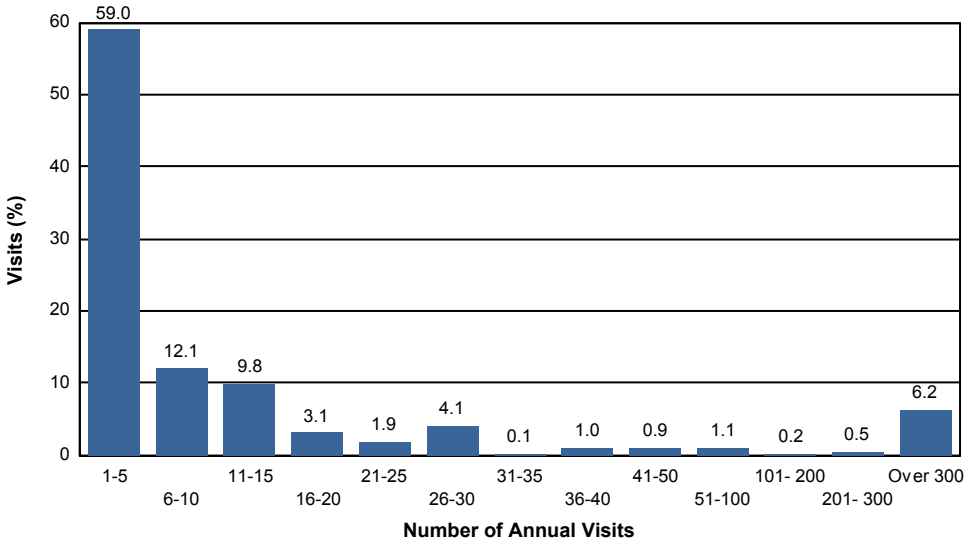
During the interview, visitors were asked how often they visit this national forest for all recreational activities, and how often for their primary activity. Table 12 summarizes the percent of visits that are made by those in each frequency category for this National Forest.

Table 11. Group Characteristics

Characteristic	Average
Percent of visits that were to just one national forest site during the National Forest Visit*	86.9
Number of national forest sites visited on National Forest Visit*	1.3
Group Size	2.5
Axles per Vehicle	2.3

Table 12. Percent of National Forest Visits* by Annual Visit Frequency

Number of Annual Visits	Visits (%)†	Cumulative Visits (%)
1 - 5	59.0	59.0
6 - 10	12.1	71.1
11 - 15	9.8	80.8
16 - 20	3.1	83.9
21 - 25	1.9	85.9
26 - 30	4.1	90.0
31 - 35	0.1	90.1
36 - 40	1.0	91.1
41 - 50	0.9	92.0
51 - 100	1.1	93.1
101 - 200	0.2	93.3
201 - 300	0.5	93.8
Over 300	6.2	100.0



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† The first row indicates the percent of National Forest Visits made by persons who visit 1 to 5 times per year. The last row indicates the percent of National Forest Visits made by persons who visit more than 300 times per year.

3.3. Activities

After identifying their main recreational activity, visitors were asked how many hours they spent participating in that main activity during this national forest visit. Some caution is needed when using this information. Because most national forest visitors participate in several recreation activities during each visit, it is more than likely that other visitors also participated in this activity, but did not identify it as their main activity. For example, on one national forest 63 % of visitors identified viewing wildlife as a recreational activity that they participated in during this visit, however only 3% identified that activity as their main recreational activity. The information on average hours viewing wildlife is only for the 3% who reported it as a main activity.

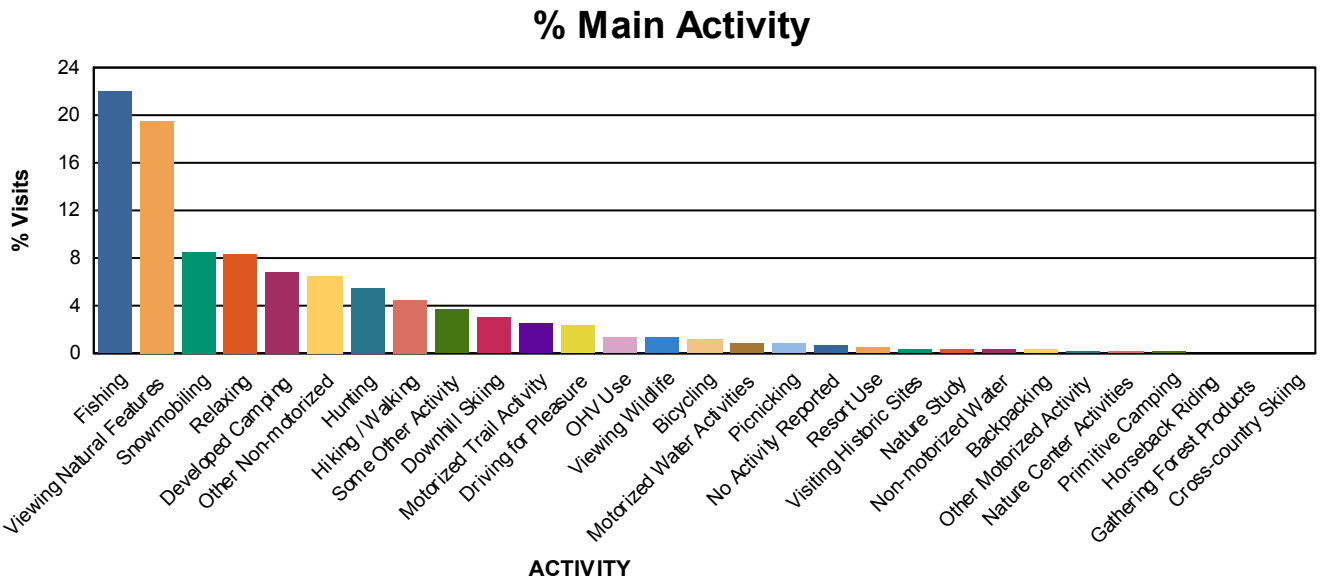
The three most popular primary activities for this forest are fishing (22%), viewing natural features (19%), and snowmobiliing (8%). More than half of the visits include participation in viewing scenery (56%).

Use of Constructed Facilities and Designated Areas

About one-third of recreation visitors interviewed were asked about whether they made use of a targeted set of facilities and special designated areas during their visit. These results are displayed in Table 14.

Table 13. Activity Participation

Activity	% Participation*	% Main Activity‡	Avg Hours Doing Main Activity
Viewing Natural Features	56.7	19.4	8.0
Relaxing	42.1	8.3	31.0
Viewing Wildlife	35.4	1.2	6.8
Hiking / Walking	35.3	4.4	3.5
Fishing	27.9	22.0	9.8
Developed Camping	26.1	6.7	35.7
Driving for Pleasure	24.2	2.3	3.9
Other Non-motorized	13.9	6.4	2.6
Snowmobiling	9.6	8.4	3.9
Motorized Water Activities	9.4	0.8	2.8
Gathering Forest Products	8.9	0.0	0.0
Picnicking	7.7	0.8	14.3
Hunting	6.3	5.4	14.5
Bicycling	6.2	1.0	9.5
Downhill Skiing	5.2	3.0	1.8
Nature Study	5.1	0.3	4.4
Visiting Historic Sites	4.9	0.3	1.0
Nature Center Activities	4.7	0.1	1.0
OHV Use	4.0	1.3	1.3
Some Other Activity	3.8	3.6	2.2
Motorized Trail Activity	3.4	2.5	4.0
Resort Use	3.2	0.4	2.0
Primitive Camping	3.1	0.1	42.0
Non-motorized Water	2.5	0.3	3.0
Cross-country Skiing	1.8	0.0	0.0
Backpacking	1.5	0.2	4.8
Other Motorized Activity	0.9	0.1	4.0
No Activity Reported	0.7	0.7	
Horseback Riding	0.0	0.0	3.0



* Survey respondents could select multiple activities so this column may total more than 100%.

‡ Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

Table 14. Percent of National Forest Visits* Indicating Use of Special Facilities or Areas

Special Facility or Area	% of National Forest Visits†
Developed Swimming Site	35.1
Scenic Byway	56.5
Visitor Center or Museum	9.9
Designated ORV Area	10.1
Forest Roads	9.5
Interpretive Displays	7.9
Information Sites	7.5
Developed Fishing Site	33.7
Motorized Single Track Trails	19.4
Motorized Dual Track Trails	15.7
None of these Facilities	16.9

* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Survey respondents could select as many or as few special facilities or areas as appropriate.

4. ECONOMIC INFORMATION

Forest managers are usually very interested in the impact of National Forest recreation visits on the local economy. As commodity production of timber and other resources has declined, local communities look increasingly to tourism to support their communities. When considering recreation-related visitor spending managers are often interested both in identifying the average spending of individual visitors (or types of visitors) and the total spending associated with all recreation use. Spending averages for visitors or visitor parties can be estimated using data collected from a statistically valid visitor sampling program such as NVUM. To estimate the total spending associated with recreation use, three pieces of information are needed: an overall visitation estimate, the proportion of visits in the visitor types, and the average spending profiles for each of the visitor types. Multiplying the three gives a total amount of spending by a particular type of visitor. Summing over all visitor types gives total spending.

About one-third of the NVUM surveys included questions about trip-related spending within 50 miles of the site visited. Spending data collected from 2000 to 2003 were analyzed at Michigan State University by Dr. Daniel Stynes and Dr. Eric White. A description of that analysis and the results are in the report “Spending Profiles of National Forest Visitors: NVUM four-year report”, available at http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf. Analysis of spending data for the 2005 - 2009 data collection periods was completed in summer of 2010.

4.1. Spending Segments

The spending that occurs on a recreation trip is greatly influenced by the type of recreation trip taken. For example, visitors on overnight trips away from home typically have to pay for some form of lodging (e.g., hotel/motel rooms, fees in a developed campground, etc.) while those on day trips do not. In addition, visitors on overnight trips will generally have to purchase more food during their trip (in restaurants or grocery stores) than visitors on day trips. Visitors who have not traveled far from home to the recreation location usually spend less than visitors traveling longer distances, especially on items such as fuel and food. Analysis of spending patterns has shown that a good way to construct segments of the visitor market with consistent spending patterns is the following seven groupings:

1. local visitors on day trips,
2. local visitors on overnight trips staying in lodging on the national forest,
3. local visitors on overnight trips staying in lodging off the national forest, and
4. non-local visitors on day trips,
5. non-local visitors on overnight trips staying in lodging on the national forest,
6. non-local visitors on overnight trips staying in lodging off the forest,
7. non-primary visitors.

Local visitors are those who travel less than 50 road miles from home to the recreation site visited and non-local visitors are those who travel greater than 50 road miles to the recreation site visited. Non-primary visitors are those for whom the primary purpose of their trip is something other than recreating on that national forest. Table 15 shows the distribution of visits by spending segment.

Almost half of the visits to the Lassen are people who are on day trips away from home. And for

about one out of eight visits, the Lassen is a side trip on the way to some other recreation destination. Consequently, we would expect most visits to involve very little spending in the area around the forest. Half of the visiting parties spend less than $100 per party per trip. About seven percent of the visits are made by people with incomes over $150,000. On the other hand, only about 10 percent are made by people from households making less than $25,000 per year.

Table 15. Distribution of National Forest Visits* by Market Segment†

	Non-Local Segments			Local Segments				
	Day	Overnight on NF	Overnight off NF	Day	Overnight on NF	Overnight off NF	Non-Primary‡	Total
Number of National Forest Visits								
Percent of National Forest Visits								

* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† The market segments shown here relate to the type of recreation trip taken. A recreation trip is defined as the duration of time beginning when the visitor left their home and ending when they got back to their home. “Non-local” trips are those where the individual(s) traveled greater than approximately 50 miles from home to the site visited. “Day” trips do not involve an overnight stay outside the home, “overnight on-forest” trips are those with an overnight stay outside the home on National Forest System (NFS) land, and “overnight off-forest” trips are those with an overnight stay outside the home off National Forest System land.

‡ “Non-primary” trips are those where the primary recreation destination of the trip was somewhere other than the national forest under consideration.

Individuals are urged to consult an economist when interpreting the NVUM economic tables.

4.2. Spending Profiles

Spending profiles for each segment for this forest can be found in the Stynes and White report noted above. Appendix Table A-1 in that report identifies whether the forest has a high-spending profile (Table 7 of Stynes and White), an average profile (Table 5), or a low-spending profile (Table 8). It is essential to note that these spending profiles are in dollars spent per **party**. Obtaining per-visit spending is accomplished by dividing the spending for each segment by the average people per party for the forest and segment found in Appendix Table A-3 of that report.

4.3. Total Direct Spending

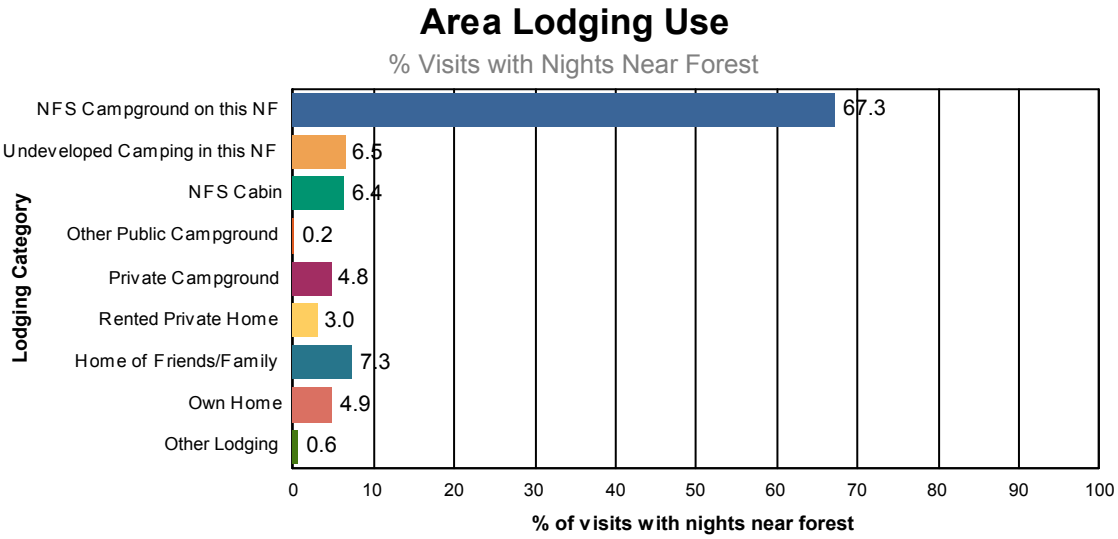
Total direct spending made within 50 miles of the forest and associated with national forest recreation is calculated by combining estimates of per-visit spending averages from the spending profiles with estimates of the number of national forest visits in the segment. The number of visits in the segment equals the percentage in Table 15 times the number of National Forest visits reported in Table 2.

4.4. Other Visit Information

There are several other important aspects of the trips on which the recreation visits to the forest are made. These are summarized in Table 16. The first aspect relates to total amount spent by the recreating party on the trip. This includes spending not just within 50 miles of the forest, but anywhere. The table shows both the average and the median. Another set describes the overall length of the trips on which the visits are made. The table shows the percent of the visits that were made on trips where the person stayed away from home overnight (even though the forest visit may be just a day visit), and the average total nights away from home and nights spent within 50 miles of the forest. For those spending one or more nights in or near the forest, the table shows the percentage that selected each of a series of lodging options. Together, these results help show the context of overall trip length and lodging patterns for visitors to the forest.

Table 16. Trip Spending and Lodging Usage

Trip Spending	Value
Average Total Trip Spending per Party	$204
Median Total Trip Spending per Party	$100
% NF Visits made on trip with overnight stay away from home	40.5%
% NF Visits with overnight stay within 50 miles of NF	37.5%
Mean nights/visit within 50 miles of NF	3.5
Area Lodging Use	**% Visits with Nights Near Forest**
NFS Campground on this NF	67.3%
Undeveloped Camping in this NF	6.5%
NFS Cabin	6.4%
Other Public Campground	0.2%
Private Campground	4.8%
Rented Private Home	3.0%
Home of Friends/Family	7.3%
Own Home	4.9%
Other Lodging	0.6%



4.5. Household Income

Visitors were asked to report a general category for their total household income. Only very general categories were used, to minimize the intrusive nature of the question. Results help indicate the overall socio-economic status of visitors to the forest, and are found in Table 17.

Table 17. Percent of National Forest Visits* by Annual Household Income

Annual Household Income Category	National Forest Visits (%)
Under $25,000	9.8
$25,000 to $49,999	11.7
$50,000 to $74,999	22.5
$75,000 to $99,999	24.0
$100,000 to $149,999	24.9
$150,000 and up	7.1
Total	100.0

* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

4.6. Substitute Behavior

Visitors were asked to select one of several substitute choices, if for some reason they were unable to visit this national forest (Figure 3). Choices included going somewhere else for the same activity they did on the current trip, coming back to this forest for the same activity at some later time, going someplace else for a different activity, staying at home and not making a recreation trip, going to work instead of recreating, and a residual 'other' category. On most forests, the majority of visitors indicate that their substitute behavior choice is activity driven (going elsewhere for same activity) and a smaller percentage indicate they would come back later to this national forest for the same activity. For those visitors who said they would have gone somewhere else for recreation they were asked how far from their home this alternate destination was. These results are shown in Figure 4.

Figure 3. Substitute Behavior Choices

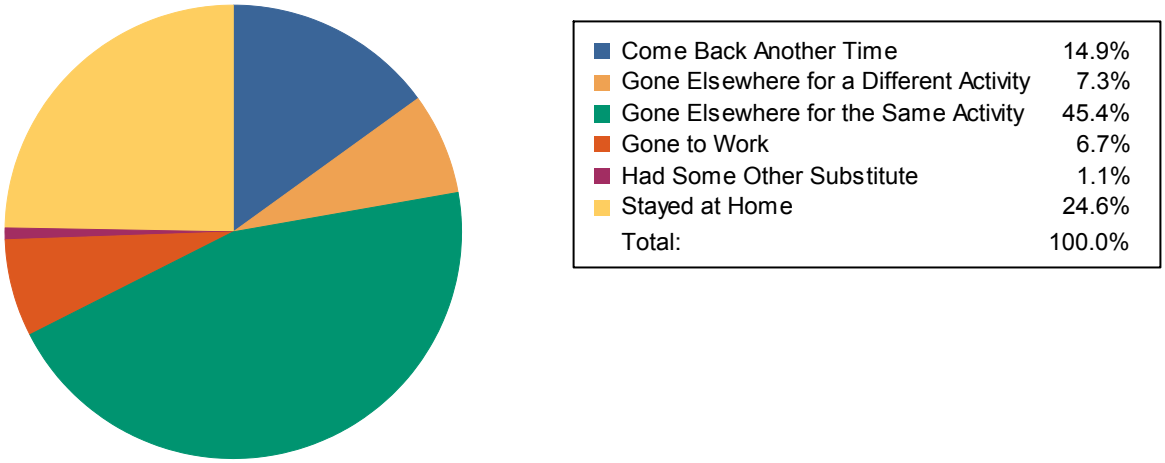
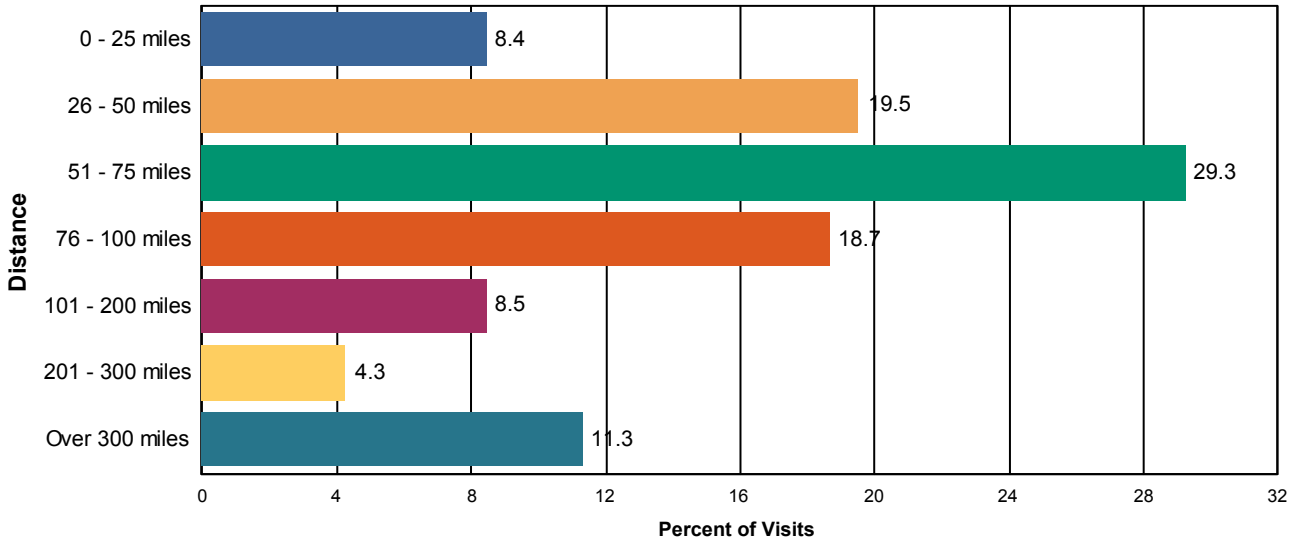


Figure 4. Reported Distance Visitors Would Travel to Alternate Location



5. SATISFACTION INFORMATION

An important element of outdoor recreation program delivery is evaluating customer satisfaction with the recreation setting, facilities, and services provided. Satisfaction information helps managers decide where to invest in resources and to allocate resources more efficiently toward improving customer satisfaction. Satisfaction is a core piece of data for national- and forest-level performance measures. To describe customer satisfaction, several different measures are used. Recreation visitors were asked to provide an overall rating of their visit to the national forest, on a 5-point Likert scale. About one-third of visitors interviewed on the forest rated their satisfaction with fourteen elements related to recreation facilities and services, and the importance of those elements to their recreation experience. Visitors were asked to rate the specific site or area at which they were interviewed. Visitors rated both the importance and performance (satisfaction with) of these elements using a 5-point scale. The Likert scale for importance ranged from not important to very important. The Likert scale for performance ranged from very dissatisfied to very satisfied. Although the satisfaction ratings specifically referenced the area where the visitor was interviewed, the survey design does not usually have enough responses for any individual site or area on the forest to present information at a site level. Rather, the information is generalized to overall satisfaction within the three site types: Day Use Developed (DUDS), Overnight Use Developed (OUDS), General Forest Areas, and on the forest as a whole.

The satisfaction responses are analyzed in several ways. First, a graph of overall satisfaction is presented in Figure 5. Next, two aggregate measures were calculated from the set of individual elements. The satisfaction elements most readily controlled by managers were aggregated into four categories: developed facilities, access, services, and visitor safety. The site types sampled were aggregated into three groups: developed sites (includes both day use and overnight developed sites), dispersed areas, and designated Wilderness. The first aggregate measure is called “Percent Satisfied Index (PSI)”, which is the proportion of all ratings for the elements in the category where the satisfaction ratings had a numerical rating of 4 or 5. Conceptually, the PSI indicator shows the percent of all recreation customers who are satisfied with agency performance. The agency’s national target for this measure is 85%. It is usually difficult to consistently have a higher satisfaction score than 85% since given tradeoffs among user groups and other factors. Table 18 displays the aggregate PSI scores for this forest.

Another aggregate measure of satisfaction is called “Percent Meet Expectations (PME)”. This is the proportion of satisfaction ratings in which the numerical satisfaction rating for a particular element is equal to or greater than the importance rating for that element. This indicator tracks the congruence between the agency’s performance and customer evaluations of importance. The idea behind this measure is that those elements with higher importance levels must have higher performance levels. Figure 6 displays the PME scores by type of site. Lower scores indicate a gap between desires and performance.

An Importance-Performance Analysis (IPA) (Hudson, et al, Feb 2004) was calculated for the importance and satisfaction scores. A target level of importance and performance divides the possible set of score pairs into four quadrants. For this work, the target level of both was a numerical score of 4.0. Each quadrant has a title that helps in interpreting responses that fall into it, and that provides some general guidance for management. These can be described as:

1. Importance at or above 4.0, Satisfaction at or above 4.0: **Keep up the good work**. These are items that are important to visitors and ones that the forest is performing quite well;
2. Importance at or above 4.0, Satisfaction under 4.0: **Concentrate here**. These are important items to the public, but performance is not where it needs to be. Increasing effort here is likely to have the greatest payoff in overall customer satisfaction;
3. Importance below 4.0, Satisfaction above 4.0: **Possible overkill**. These are items that are not highly important to visitors, but the forest's performance is quite good. It may be possible to reduce effort here without greatly harming overall satisfaction;
4. Importance below 4.0; Satisfaction below 4.0: **Low Priority**. These are items where performance is not very good, but neither are they important to visitors. Focusing effort here is unlikely to have a great impact.

We present tables that show the I-P rating title for each satisfaction element. Each sitetype is presented in a separate table. Results are presented in Tables 19 - 22.

The numerical scores for visitor satisfaction and importance for each element by site type, and the sample sizes for each are presented in Appendix B (Tables B1 - B4). Most managers find it difficult to discern meaning from these raw tables; however they may wish to examine specific elements once they have reviewed the other satisfaction information presented in this section. Note that if an element had fewer than 10 responses no analyses are performed, as there are too few responses to provide reliable information. Finally, visitors were asked about their overall satisfaction with and the importance of road condition and the adequacy of signage. Figure 7a and Figure 7b show the results.

The results of the overall satisfaction ratings are quite good. About eighty percent gave a rating of very satisfied; another 12 percent indicated they were somewhat satisfied. The composite index ratings were also quite good. Satisfaction ratings for perception of safety were at least 89 percent for all types of sites. However, the ratings for the services composite were below 85 percent.

Figure 5. Percent of National Forest Visits by Overall Satisfaction Rating

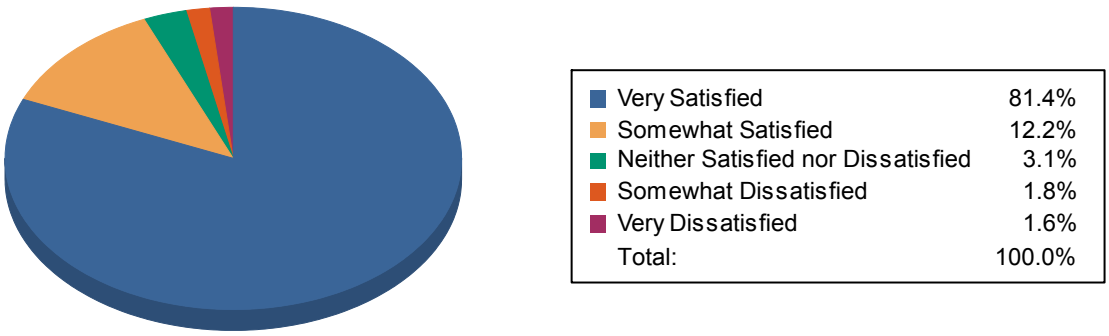


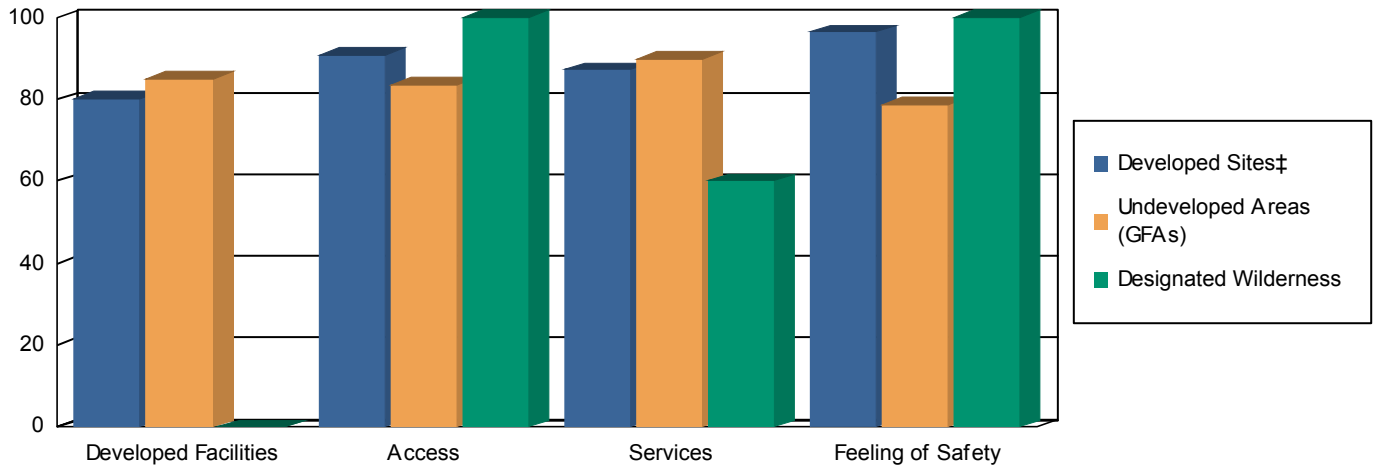
Table 18. Percent Satisfied Index† Scores for Aggregate Categories

Satisfaction Element	Satisfied Survey Respondents (%)		
	Developed Sites‡	Undeveloped Areas (GFAs)	Designated Wilderness
Developed Facilities	88.2	96.3	0.0
Access	92.1	94.5	81.8
Services	83.0	77.8	80.0
Feeling of Safety	96.6	89.0	100.0

† This is a composite rating. It is the proportion of satisfaction ratings scored by visitors as good (4) or very good (5). Computed as the percentage of all ratings for the elements within the sub grouping that are at or above the target level, and indicates the percent of all visitors that are reasonably well satisfied with agency performance.

‡ This category includes both Day Use and Overnight Use Developed Sites.

Figure 6. Percent Meets Expectations Scores*



* “Percent Meet Expectations (PME)” is the proportion of satisfaction ratings in which the numerical satisfaction rating for a particular element is equal to or greater than the importance rating for that element. This indicator tracks the congruence between the agency’s performance and customer evaluations of importance. The idea behind this measure is that those elements with higher importance levels must have higher performance levels. Lower scores indicate a gap between desires and performance.

‡ This category includes both Day Use and Overnight Use Developed Sites.

Table 19. Importance-Performance Ratings for Day Use Developed Sites

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	Keep up the Good Work
Developed Facilities	Keep up the Good Work
Condition of Environment	Keep up the Good Work
Employee Helpfulness	Keep up the Good Work
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Keep up the Good Work
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Keep up the Good Work
Trail Condition	Keep up the Good Work
Value for Fee Paid	Keep up the Good Work

Table 20. Importance-Performance Ratings for Overnight Developed Sites

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	Keep up the Good Work
Developed Facilities	Keep up the Good Work
Condition of Environment	Keep up the Good Work
Employee Helpfulness	Keep up the Good Work
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Keep up the Good Work
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Keep up the Good Work
Trail Condition	Keep up the Good Work
Value for Fee Paid	Keep up the Good Work

Table 21. Importance-Performance Ratings for Undeveloped Areas (GFAs)

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	*
Developed Facilities	*
Condition of Environment	Keep up the Good Work
Employee Helpfulness	*
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Keep up the Good Work
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Concentrate Here
Trail Condition	Keep up the Good Work
Value for Fee Paid	*

* The data was not reported for items with fewer than 10 responses.

Table 22. Importance-Performance Ratings for Designated Wilderness

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	
Developed Facilities	
Condition of Environment	*
Employee Helpfulness	
Interpretive Displays	*
Parking Availability	*
Parking Lot Condition	*
Rec. Info. Availability	*
Road Condition	*
Feeling of Satefy	*
Scenery	*
Signage Adequacy	*
Trail Condition	*
Value for Fee Paid	

* The data was not reported for items with fewer than 10 responses.

Figure 7a. Satisfaction with Forest-wide Road Conditions & Signage Adequacy

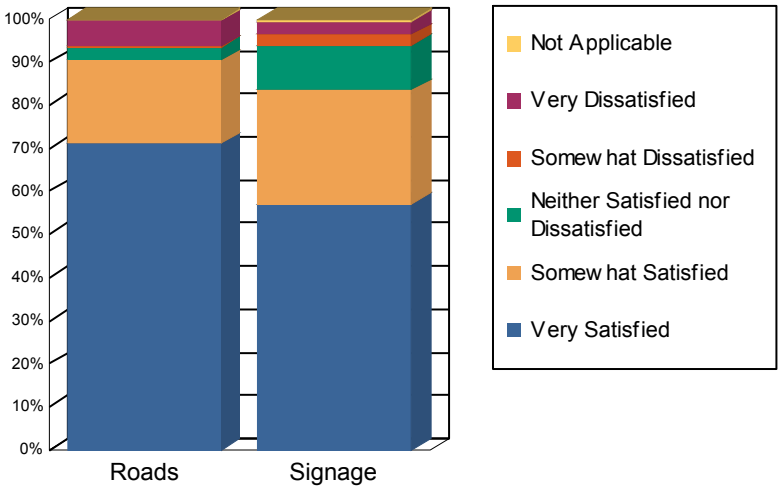
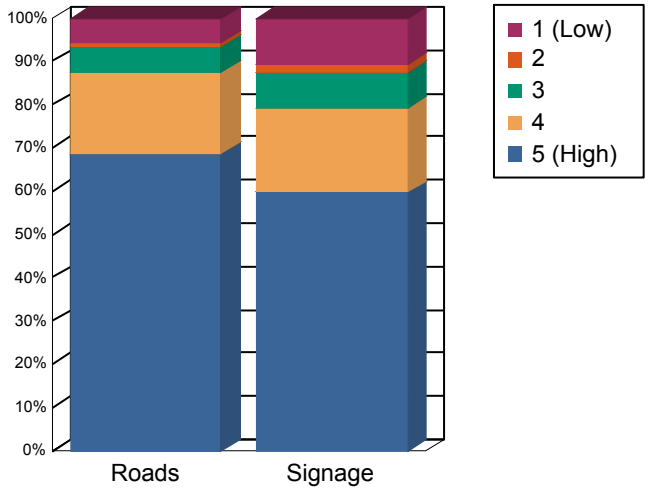


Figure 7b. Importance of Forest-wide Road Conditions & Signage Adequacy

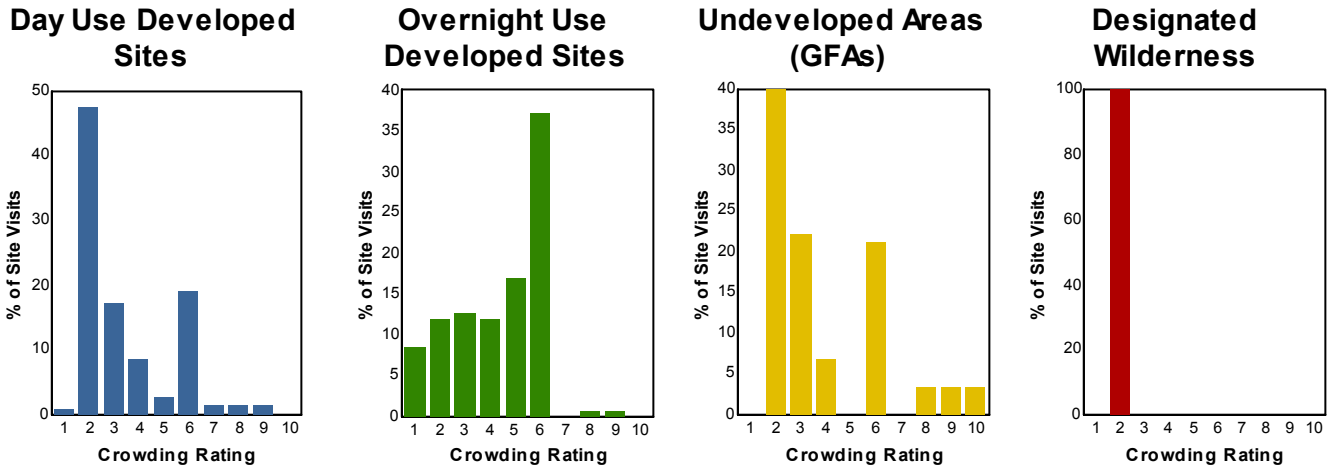


5.1. Crowding

Visitors rated their perception of how crowded the recreation site or area felt to them. This information is useful when looking at the type of site the visitor was using since someone visiting a designated Wilderness may think 5 people is too many while someone visiting a developed campground may think 200 people is about right. Table 23 shows the distribution of responses for each site type. Crowding was reported on a scale of 1 to 10 where 1 denotes hardly anyone was there, and a 10 indicates the area was perceived as overcrowded.

Table 23. Percent of Site Visits* by Crowding Rating and Site Type

Crowding Rating†	Site Types (% of Site Visits)			
	Day Use Developed Sites	Overnight Use Developed Sites	Undeveloped Areas (GFAs)	Designated Wilderness
10 - Overcrowded	0.0	0.0	3.4	0.0
9	1.5	0.7	3.4	0.0
8	1.4	0.7	3.4	0.0
7	1.4	0.0	0.0	0.0
6	19.0	37.2	21.2	0.0
5	2.8	16.9	0.0	0.0
4	8.5	11.9	6.8	0.0
3	17.0	12.5	22.1	0.0
2	47.4	11.9	39.8	100.0
1 - Hardly anyone there	0.9	8.4	0.0	0.0
Average Rating	**3.4**	**4.4**	**3.9**	**2.0**



* A Site Visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time.

† Survey respondents rated how crowded the site or area they were interviewed at was using a scale of 1 to 10 where 1 meant hardly anyone was there and 10 meant the site or area was overcrowded.

5.2. Disabilities

Providing barrier-free facilities for recreation visitors is an important part of facility and service planning and development. One question asked if anyone in their group had a disability. If so, the visitor was then asked if the facilities at the sites they visited were accessible for this person (Table 24).

Table 24. Accessibility of National Forest Facilities by Persons with Disabilities

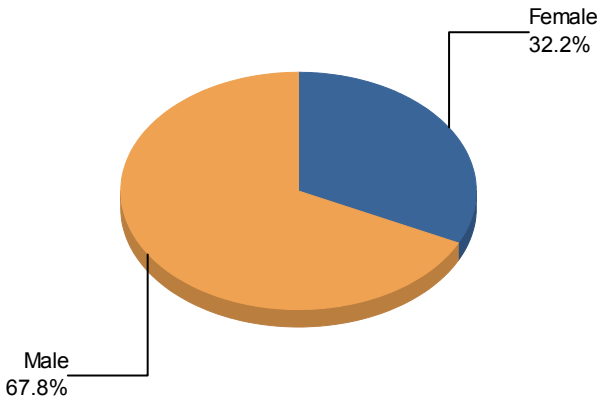
Item	Percent
% of visits that include a group member with a disability	12.9
Of this group, percent who said facilities at site visited were accessible	97.0

6. WILDERNESS VISIT DEMOGRAPHICS

Visits to Wilderness are sometimes made by a particular subset of the overall visitor population. In this chapter, tables are presented that describe the demographic characteristics of those who visit designated wilderness on this forest. Table 25 shows the gender breakdown, Table 26 the racial and ethnicity distribution, and the Table 27 age composition. In Table 28, a frequency analysis of Zip Codes obtained from respondents is presented, to give a rough idea of the common origins of Wilderness visitors.

Table 25. Percent of Wilderness Site Visits* by Gender

Gender	Survey Respondents†	Wilderness Site Visits (%)‡
Female	12	32.2
Male	22	67.8
Total	**34**	**100.0**



* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Non-respondents to gender questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 26. Percent of Wilderness Site Visits* by Race/Ethnicity

Race †	Survey Respondents‡	Wilderness Site Visits (%)§
American Indian / Alaska Native		
Asian		
Black / African American		
Hawaiian / Pacific Islander		
White		
Total		

Ethnicity†	Survey Respondents‡	Wilderness Site Visits (%)§
Hispanic / Latino		

NOTE: The data was not reported for items with fewer than 16 responses.

* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

Respondents could choose more than one racial group, so the total may be more than 100%.

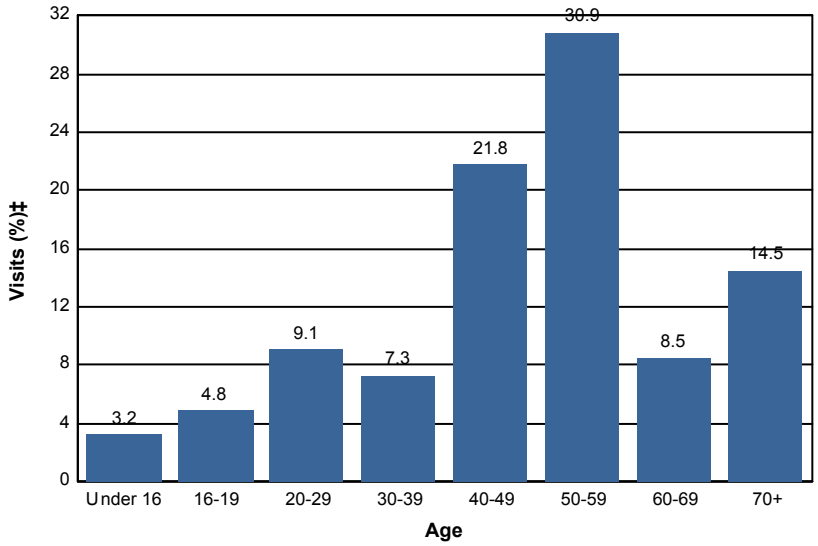
† Race and Ethnicity were asked as two separate questions.

‡ Non-respondents to race/ethnicity questions were excluded from analysis.

§ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 27. Percent of Wilderness Site Visits* by Age

Age Class	Wilderness Site Visits (%)‡
Under 16	3.2
16-19	4.8
20-29	9.1
30-39	7.3
40-49	21.8
50-59	30.9
60-69	8.5
70+	14.5
Total	**100.1**



* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Non-respondents to age questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 28. Top 15 Most Commonly Reported ZIP Codes, States and Counties of Wilderness Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
96028	California	Shasta County	6.7	1
92886	California	Orange County	6.7	1
96035	California	Tehama County	6.7	1
96114	California	Lassen County	6.7	1
94920	California	Marin County	6.7	1
96013	California	Shasta County	6.7	1
96101	California	Modoc County	6.7	1
94563	California	Contra Costa County	6.7	1
96059	California	Tehama County	6.7	1
94533	California	Solano County	6.7	1
96021	California	Tehama County	6.7	1
94530	California	Contra Costa County	6.7	1
96073	California	Shasta County	6.7	1
95610	California	Sacramento County	6.7	1
Foreign Country			6.7	1

* Includes respondents reporting no ZIP code or an invalid ZIP code.

7. APPENDIX TABLES

APPENDIX A - Complete List of ZIP Codes

Table A-1. ZIP Codes, States and Counties of National Forest Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
96130	California	Lassen County	6.7	27
96080	California	Tehama County	3.2	13
96002	California	Shasta County	3.0	12
96007	California	Shasta County	3.0	12
95973	California	Butte County	2.5	10
96022	California	Shasta County	2.5	10
96001	California	Shasta County	2.5	10
96020	California	Plumas County	2.5	10
95926	California	Butte County	2.0	8
96114	California	Lassen County	2.0	8
96088	California	Shasta County	1.7	7
96137	California	Lassen County	1.7	7
95928	California	Butte County	1.7	7
Unknown Origin*			1.5	6
96003	California	Shasta County	1.5	6
95969	California	Butte County	1.2	5
95472	California	Sonoma County	1.0	4
95942	California	Butte County	1.0	4
95965	California	Butte County	0.7	3
94024	California	Santa Clara County	0.7	3
Foreign Country			0.7	3
95476	California	Sonoma County	0.7	3
95938	California	Butte County	0.7	3
96059	California	Tehama County	0.7	3
89511	Nevada	Washoe County	0.7	3
95451	California	Lake County	0.7	3
95954	California	Butte County	0.7	3
96019	California	Shasta County	0.7	3
96013	California	Shasta County	0.5	2
95628	California	Sacramento County	0.5	2
95757	California	Sacramento County	0.5	2
93560	California	Kern County	0.5	2
95610	California	Sacramento County	0.5	2
89508	Nevada	Washoe County	0.5	2
95963	California	Glenn County	0.5	2
95988	California	Glenn County	0.5	2
96117	California	Lassen County	0.5	2
96128	California	Lassen County	0.5	2
95949	California	Nevada County	0.5	2
96161	California	Nevada County	0.5	2

93401	California	San Luis Obispo County	0.5	2
95966	California	Butte County	0.5	2
89502	Nevada	Washoe County	0.5	2
89434	Nevada	Washoe County	0.5	2
95062	California	Santa Cruz County	0.5	2
96035	California	Tehama County	0.5	2
96094	California	Siskiyou County	0.5	2
95037	California	Santa Clara County	0.5	2
94530	California	Contra Costa County	0.5	2
96073	California	Shasta County	0.5	2
93614	California	Madera County	0.5	2
96136	California	Lassen County	0.5	2
95961	California	Yuba County	0.5	2
86001	Arizona	Coconino County	0.5	2
95630	California	Sacramento County	0.5	2
96127	California	Lassen County	0.5	2
95403	California	Sonoma County	0.5	2
89506	Nevada	Washoe County	0.5	2
91505	California	Los Angeles County	0.2	1
95664	California	El Dorado County	0.2	1
95667	California	El Dorado County	0.2	1
95501	California	Humboldt County	0.2	1
92277	California	San Bernardino County	0.2	1
95526	California	Humboldt County	0.2	1
16101	Pennsylvania	Lawrence County	0.2	1
94040	California	Santa Clara County	0.2	1
95073	California	Santa Cruz County	0.2	1
94602	California	Alameda County	0.2	1
96028	California	Shasta County	0.2	1
82001	Wyoming	Laramie County	0.2	1
95026	California	Santa Clara County	0.2	1
94306	California	Santa Clara County	0.2	1
96071	California	Shasta County	0.2	1
95673	California	Sacramento County	0.2	1
95976	California	Butte County	0.2	1
94951	California	Sonoma County	0.2	1
95138	California	Santa Clara County	0.2	1
89521	Nevada	Washoe County	0.2	1
95831	California	Sacramento County	0.2	1
93619	California	Fresno County	0.2	1
95828	California	Sacramento County	0.2	1
96140	California	Placer County	0.2	1
91941	California	San Diego County	0.2	1
93561	California	Kern County	0.2	1
89433	Nevada	Washoe County	0.2	1
95687	California	Solano County	0.2	1
95402	California	Sonoma County	0.2	1
95943	California	Glenn County	0.2	1
85704	Arizona	Pima County	0.2	1
94127	California	San Francisco County	0.2	1
94549	California	Contra Costa County	0.2	1

97701	Oregon	Deschutes County	0.2	1
94566	California	Alameda County	0.2	1
94920	California	Marin County	0.2	1
95960	California	Nevada County	0.2	1
95135	California	Santa Clara County	0.2	1
89431	Nevada	Washoe County	0.2	1
95953	California	Sutter County	0.2	1
96047	California	Shasta County	0.2	1
91386	California	Los Angeles County	0.2	1
95249	California	Calaveras County	0.2	1
94505	California	Contra Costa County	0.2	1
96008	California	Shasta County	0.2	1
90055	California	Los Angeles County	0.2	1
76502	Texas	Bell County	0.2	1
95652	California	Sacramento County	0.2	1
89408	Nevada	Lyon County	0.2	1
98117	Washington	King County	0.2	1
96101	California	Modoc County	0.2	1
91746	California	Los Angeles County	0.2	1
90274	California	Los Angeles County	0.2	1
95621	California	Sacramento County	0.2	1
55037	Minnesota	Pine County	0.2	1
89801	Nevada	Elko County	0.2	1
95602	California	Placer County	0.2	1
77450	Texas	Harris County	0.2	1
96049	California	Shasta County	0.2	1
81054	Colorado	Bent County	0.2	1
95246	California	Calaveras County	0.2	1
94608	California	Alameda County	0.2	1
95363	California	Stanislaus County	0.2	1
95616	California	Yolo County	0.2	1
91773	California	Los Angeles County	0.2	1
94560	California	Alameda County	0.2	1
94563	California	Contra Costa County	0.2	1
95950	California	Colusa County	0.2	1
94618	California	Alameda County	0.2	1
48035	Michigan	Macomb County	0.2	1
89406	Nevada	Churchill County	0.2	1
95864	California	Sacramento County	0.2	1
94561	California	Contra Costa County	0.2	1
22624	Virginia	Frederick County	0.2	1
95503	California	Humboldt County	0.2	1
95357	California	Stanislaus County	0.2	1
95573	California	Humboldt County	0.2	1
97525	Oregon	Jackson County	0.2	1
96121	California	Lassen County	0.2	1
91710	California	San Bernardino County	0.2	1
95370	California	Tuolumne County	0.2	1
86021	Arizona	Mohave County	0.2	1
27284	North Carolina	Forsyth County	0.2	1
95435	California	Lake County	0.2	1

94401	California	San Mateo County	0.2	1
80214	Colorado	Jefferson County	0.2	1
94533	California	Solano County	0.2	1
95923	California	Plumas County	0.2	1
95975	California	Nevada County	0.2	1
96021	California	Tehama County	0.2	1
95051	California	Santa Clara County	0.2	1
96067	California	Siskiyou County	0.2	1
97535	Oregon	Jackson County	0.2	1
95936	California	Sierra County	0.2	1
95814	California	Sacramento County	0.2	1
94565	California	Contra Costa County	0.2	1
94542	California	Alameda County	0.2	1
94586	California	Alameda County	0.2	1
95993	California	Sutter County	0.2	1
95696	California	Solano County	0.2	1
94025	California	San Mateo County	0.2	1
95762	California	El Dorado County	0.2	1
93704	California	Fresno County	0.2	1
95353	California	Stanislaus County	0.2	1
95818	California	Sacramento County	0.2	1
96093	California	Trinity County	0.2	1
90066	California	Los Angeles County	0.2	1
95682	California	El Dorado County	0.2	1
92223	California	Riverside County	0.2	1
94301	California	Santa Clara County	0.2	1
95842	California	Sacramento County	0.2	1
94610	California	Alameda County	0.2	1
95350	California	Stanislaus County	0.2	1
95679	California	Yolo County	0.2	1
95618	California	Yolo County	0.2	1
94131	California	San Francisco County	0.2	1
95305	California	Tuolumne County	0.2	1
93555	California	Kern County	0.2	1
95991	California	Sutter County	0.2	1
95916	California	Butte County	0.2	1
94930	California	Marin County	0.2	1
94945	California	Marin County	0.2	1
89445	Nevada	Humboldt County	0.2	1
94087	California	Santa Clara County	0.2	1
95820	California	Sacramento County	0.2	1
94541	California	Alameda County	0.2	1
95660	California	Sacramento County	0.2	1
95409	California	Sonoma County	0.2	1
89436	Nevada	Washoe County	0.2	1
94534	California	Solano County	0.2	1
96135	California	Plumas County	0.2	1
95948	California	Butte County	0.2	1
89407	Nevada	Churchill County	0.2	1
95482	California	Mendocino County	0.2	1
95967	California	Butte County	0.2	1

93933	California	Monterey County	0.2	1
95624	California	Sacramento County	0.2	1
95987	California	Colusa County	0.2	1
93514	California	Inyo County	0.2	1
97221	Oregon	Multnomah County	0.2	1
95603	California	Placer County	0.2	1
92886	California	Orange County	0.2	1
89701	Nevada	Carson City	0.2	1
89523	Nevada	Washoe County	0.2	1
94521	California	Contra Costa County	0.2	1

* Includes respondents reporting no ZIP code or an invalid ZIP code.

APPENDIX B - Detailed Satisfaction Results

Table B-1. Satisfaction for Visits to Day Use Developed Sites

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness	2.2	2.2	5.5	19.3	70.9	4.5	4.8	54
Developed Facilities	11.9	4.4	3.2	18.8	61.7	4.1	4.8	77
Condition of Environment	0.0	0.9	0.9	14.4	83.8	4.8	4.8	77
Employee Helpfulness	7.6	1.7	0.0	5.8	84.9	4.6	4.7	40
Interpretive Displays	3.1	1.2	15.8	14.4	65.5	4.4	4.2	56
Parking Availability	0.0	1.5	0.0	5.6	92.9	4.9	4.7	76
Parking Lot Condition	0.9	1.8	5.5	16.6	75.3	4.6	4.5	76
Rec. Info. Availability	3.7	4.8	13.4	27.6	50.5	4.2	4.4	60
Road Condition	7.8	0.0	17.3	15.4	59.5	4.2	4.5	47
Feeling of Satefy	0.9	0.0	4.9	6.3	87.9	4.8	4.8	74
Scenery	0.0	0.9	3.1	11.6	84.4	4.8	4.6	77
Signage Adequacy	6.9	3.0	14.3	15.0	60.7	4.2	4.3	75
Trail Condition	0.0	0.0	19.6	32.4	48.1	4.3	4.5	27
Value for Fee Paid	5.0	10.8	4.7	19.3	60.1	4.2	4.7	22

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-2. Satisfaction for Visits to Overnight Developed Sites

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness	0.0	1.6	10.9	10.2	77.3	4.6	4.8	26
Developed Facilities	1.5	0.0	0.0	3.5	95.1	4.9	4.6	28
Condition of Environment	0.0	0.0	1.6	2.2	96.3	4.9	5.0	28
Employee Helpfulness	0.0	0.0	0.0	0.8	99.2	5.0	4.6	19
Interpretive Displays	0.0	0.7	21.9	29.0	48.3	4.2	4.1	26
Parking Availability	0.0	0.7	0.7	8.4	90.2	4.9	4.5	29
Parking Lot Condition	0.0	8.4	1.4	9.1	81.0	4.6	4.4	29
Rec. Info. Availability	0.0	12.2	14.0	14.8	58.9	4.2	4.2	22
Road Condition	1.1	0.0	0.0	19.0	79.8	4.8	4.7	16
Feeling of Satefy	0.0	0.0	0.0	3.4	96.6	5.0	4.7	29
Scenery	0.0	0.0	8.4	2.1	89.5	4.8	4.8	29
Signage Adequacy	1.4	0.7	1.3	18.4	78.1	4.7	4.7	28
Trail Condition	0.0	0.0	1.1	15.3	83.6	4.8	4.6	16
Value for Fee Paid	8.5	9.2	0.0	10.7	71.6	4.3	4.8	27

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-3. Satisfaction for Visits to Undeveloped Areas (GFAs)

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness							5.0	9
Developed Facilities							4.9	9
Condition of Environment	0.0	0.0	11.0	10.2	78.8	4.7	4.8	16
Employee Helpfulness								6
Interpretive Displays	0.0	0.0	20.2	14.3	65.5	4.5	4.5	12
Parking Availability	0.0	0.0	3.8	3.8	92.4	4.9	4.9	15
Parking Lot Condition	0.0	0.0	5.0	26.2	68.8	4.6	4.7	11
Rec. Info. Availability	0.0	0.0	16.3	15.0	68.8	4.5	4.6	11
Road Condition	0.0	11.0	0.0	21.2	67.8	4.5	5.0	16
Feeling of Satefy	0.0	11.0	0.0	10.2	78.8	4.6	5.0	16
Scenery	0.0	0.0	0.0	11.0	89.0	4.9	4.9	16
Signage Adequacy	14.1	4.3	18.5	8.7	54.3	3.8	4.4	14
Trail Condition	0.0	0.0	0.0	21.3	78.7	4.8	5.0	11
Value for Fee Paid								5

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-4. Satisfaction for Visits to Designated Wilderness*

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness								
Developed Facilities								
Condition of Environment								3
Employee Helpfulness								
Interpretive Displays								2
Parking Availability								3
Parking Lot Condition								3
Rec. Info. Availability								1
Road Condition								2
Feeling of Satefy								3
Scenery								3
Signage Adequacy								2
Trail Condition								3
Value for Fee Paid								

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

* Data supplied is for all Designated Wilderness on the forest combined. Data was not collected for satisfaction for each individual Wilderness on the forest.

United States Department of Agriculture

Forest Service

Natural Resource Manager

National Visitor Use Monitoring Program

Visitor Use Report

Plumas NF

USDA Forest Service
Region 5

National Visitor Use Monitoring
Data collected FY 2010

Last updated:
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CONTENTS

1. INTRODUCTION

1.1. Scope and purpose of the National Visitor Use Monitoring program

The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visitors to national forest system managed lands at the national, regional, and forest level. Information about the quantity and quality of recreation visits is required for national forest plans, Executive Order 12862 (Setting Customer Service Standards), and implementation of the National Recreation Agenda. To improve public service, the agency's Strategic and Annual Performance Plans require measuring trends in user satisfaction and use levels. NVUM information assists Congress, Forest Service leaders, and program managers in making sound decisions that best serve the public and protect valuable natural resources by providing science based, reliable information about the type, quantity, quality and location of recreation use on public lands. The information collected is also important to external customers including state agencies and private industry. NVUM methodology and analysis is explained in detail in the research paper entitled: Forest Service National Visitor Use Monitoring Process: Research Method Documentation; English, Kocis, Zarnoch, and Arnold; Southern Research Station; May 2002 (http://www.fs.fed.us/recreation/programs/nvum).

In 1998 a team of research scientists and forest staff developed a recreation sampling system (NVUM) that provides statistical recreation use information at the forest, regional, and national level. Several Forest Service staff areas including Recreation, Wilderness, Ecosystem Management, Research and Strategic Planning and Resource Assessment were involved in developing the program. From January 2000 through September 2003 every national forest implemented this methodology and collected visitor use information. This application served to test the method over the full range of forest conditions, and to provide a rough national estimate of visitation. Implementation of the improved method began in October 2004. Once every five years, each National Forest and Grassland has a year of field data collection.

This NVUM data is useful for forest planning and decision making. The description of visitor characteristics (age, race, zip code, activity participation) can help forest staff identify their recreation niche. Satisfaction information can help management decide where best to place limited resources that would result in improved visitor satisfaction. Economic expenditure information can help forests show local communities the employment and income effects of tourism from forest visitors. In addition, the visitation estimates can be helpful in considering visitor capacity issues.

1.2. Methods

To define the sampling frame, staff on each forest classify all recreation sites and areas into five basic categories called "site types": Day Use Developed Sites (DUDS), Overnight Use Developed Sites (OUDS), Designated Wilderness Areas (Wilderness), General Forest Areas (GFA), and View Corridors (VC). Only the first four categories are counted as national forest recreation visits and are included in the visit estimates. The last category is used to track the volume of people who view national forests from nearby roads; since they do not get onto agency lands, they cannot be counted as visits. For the entire sampling year, each day on each site was given a rating of very high, high, medium, low, or no use according to the expected level of recreational visitors who

would be observed leaving that location for the last time (last exiting recreation use) on that day. The combination of a calendar day and a site or area is called a site day. Site days are the basic sampling unit for the NVUM protocol. Results of this forest categorization are shown in Table 1.

In essence, visitation is estimated through a combination of traffic counts and surveys of exiting visitors. Both are obtained on a random sample of locations and days distributed over an entire forest for a year. All of the surveyed recreation visitors are asked about their visit duration, activities, demographics, travel distance, and annual usage. About one-third were also asked a series of questions about satisfaction. Another one-third were asked to provide information about their income, spending while on their trip, and the next best substitute for the visit.

1.3. Definition of Terms

NVUM has standardized measures of visitor use to ensure that all national forest visitor measures are comparable. These definitions are basically the same as established by the Forest Service in the 1970's. Visitors must pursue a recreation activity physically located "on" Forest Service managed land in order to be counted. They cannot be passing through; viewing from non-Forest Service managed roads, or just using restroom facilities. The visitation metrics are ***national forest visits*** and ***site visits.*** NVUM provides estimates of both and confidence interval statistics measuring the precision of the estimates. The NVUM methodology categorizes recreation facilities and areas into specific site types and use levels in order to develop the sampling frame. Understanding the definitions of the variables used in the sample design and statistical analysis is important in order to interpret the results.

National forest visit is the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A national forest visit can be composed of multiple site visits. The visit ends when the person leaves the national forest to spend the night somewhere else.

Site visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time. The site visit ends when the person leaves the site or area for the last time on that day.

A ***confidence interval*** is a range of values that is likely to include an unknown population value, where the range is calculated from a given set of sample data. Confidence intervals are always accompanied by a ***confidence level***, which tells the degree of certainty that the value lies in the interval. Used together these two terms define the reliability of the estimate, by defining the range of values that are needed to reach the given confidence level. For example, the 2008 national visitation estimate is 175.6 million visits, with a 90% confidence interval of 3.2%. In other words, given the NVUM data, our best estimate is 175.6 million visits, and given the underlying data, we are 90% certain that the true number is between 170.0 million and 181.2 million.

Recreation trip is the duration of time beginning when the visitor left their home and ending when they return to their home.

Site day - a day that a recreation site or area is open to the public for recreation purposes.

Proxy - information collected at a recreation site or area that is directly related to the amount of

recreation visitation received. The proxy information must pertain to all users of the site and it must be one of the proxy types allowed in the NVUM pre-work directions (fee receipts, fee envelopes, mandatory permits, permanent traffic counters, group reservations, ticket sales, and daily use records).

Nonproxy - a recreation site or area that does not have proxy information. At these sites a 24-hour traffic count is taken to measure total use for one site day at the sample site.

Use level - for each day of the year for each recreation site or area, the site day was categorized as very high, high, medium or low last exiting recreation traffic, or no exiting use. No Use could means either that the location was administratively closed, or it was open but was expected to have zero last exiting visitors. For example a picnic area may listed as having no use during winter months (120 days), high last exiting recreation volume on all other weekends (70 days) and medium last exiting recreation use on the remaining midweek days (175 days). This accounts for all 365 days of the year. This process was repeated for every site and area on the forest.

1.4. Limitations of the Results

The information presented here is valid and applicable at the forest, regional, and national level. It is not designed to be accurate at the district or site level. The quality of the visitation estimate is dependent on the sample design development, sampling unit selection, sample size and variability, and survey implementation. First, preliminary work conducted by forests to identify and consistently classify sites and access points according to the type and amount of expected exiting visitation is the key determinant of the validity and magnitude of the visitation estimate. Second, the success of the forest staff in accomplishing its assigned set of sample days, correctly filling out the interview forms, and following the field protocols influence the reliability of the results, variability of the visitation estimate, and validity of the visitation descriptions. Third, the variability of traffic counts within a sampling stratum affects the reliability of the visitation estimates. Fourth, the range of visitors sampled must be representative of the population of all visitors. Finally, the number of visitors sampled must be large enough to adequately control variability. The results and confidence intervals will reflect all these factors.

Confidence intervals indicate the reliability of the visitation estimate, given the underlying data. Large confidence intervals indicate high variability in the national forest visit (NFV), site visit (SV) and Wilderness visit estimates. Variance is caused primarily by a small sample size in number of days or having a few sampled days where the observed exiting visitation volume was very different from the normal range. For example, on a particular National Forest in the General Forest Area low stratum, there were 14 sample days. Of these 14 sample days, 13 days had visitation estimates between zero and twenty. The remaining day had a visitation estimate of 440. So the stratum mean was about 37 per day, standard error was about 116, and the 90% confidence interval width is 400% of the mean. Causes for such outlier observations are not known, but could include a misclassification of the day (a high use day incorrectly categorized as a low use day), unusual weather, malfunctioning traffic counter, or reporting errors. Eliminating the unusual observation from data analysis would reduce the variability. However, unless the NVUM team had reason to suspect the observation was incorrect they did not eliminate these unusual cases.

The descriptive information about national forest visitors is based upon only those visitors that were interviewed. Every effort was made to incorporate distinct seasonal use patterns and activities that

vary greatly by season into the sampling frame. The sampling plan took into account both the spatial and seasonal spread of visitation patterns across the forest. Even so, because of the small sample size of site-days, or because some user groups decline to participate in the survey, it is possible to under-represent certain user groups, particularly for activities that are quite limited in where or when they occur.

Note that the results of the NVUM activity analysis DO NOT identify the types of activities visitors would like to have offered on the national forests. It also does not tell us about displaced forest visitors, those who no longer visit the forest because the activities they desire are not offered.

Some forest visitors were counted and included in the total forest use estimate but were not surveyed. This included visitors to recreation special events and organization camps. Their characteristics are not included in the visit descriptions.

Caution should be used in interpreting any comparisons of these results with those obtained during the 2000 - 2003 period. Differences cannot be interpreted as a trend. Several method changes account for the differences, for both visitation estimates and visit characteristics. One key factor is that the first application of the NVUM process was largely a national beta-test of the method, and significant improvements occurred following it. The NVUM process entailed a completely new method and approach to measuring visitation on National Forest lands. Simply going through the NVUM process for the first time enabled forest staff to do a much better job thereafter in identifying sites, accurately classifying days into use level strata, and ensuring consistency across all locations on the forest. These improvements enhanced the validity of all aspects of the NVUM results. Sampling plans and quality control procedures were also improved.

2. VISITATION ESTIMATES

2.1. Forest Definition of Site Days

The population of site days for sampling was constructed from information provided by forest staff. For each site, each day of the year was given a rating of very high, high, medium, low, or none according to the expected volume of recreation visitors who would be leaving the site or area for the last time (last exiting recreation use). The stratum, a combination of site type and use level, was then used to construct the sampling frame. The results of the recreation site/area stratification and days sampled are displayed in Table 1.

Table 1. Site Days and Percentage of Days Sampled by Stratum

Stratum*		Days Sampled	Site Days# in Use Level/Proxy Population	Sampling Rate (%)&
Site Type†	Use Level‡ or Proxy Code§			
DUDS	HIGH	12	115	10.4
DUDS	MEDIUM	15	405	3.7
DUDS	LOW	15	1,504	1.0
OUDS	MEDIUM	9	81	11.1
OUDS	LOW	15	924	1.6
OUDS	DUR4	13	3,606	0.4
OUDS	DUR5	8	297	2.7
OUDS	FE4	7	136	5.1
OUDS	RE4	8	549	1.5
GFA	HIGH	16	356	4.5
GFA	MEDIUM	15	1,230	1.2
GFA	LOW	28	7,449	0.4
WILDERNESS	HIGH	9	60	15.0
WILDERNESS	MEDIUM	13	162	8.0
WILDERNESS	LOW	12	492	2.4
Total		**195**	**17,366**	**1.1**

* Stratum is the combination of the site type and use level or proxy code. Sample days were independently drawn within each stratum.

† DUDS = Day Use Developed Site, OUDS = Overnight Use Developed Site, GFA = General Forest Area (“Undeveloped Areas”), WILDERNESS = Designated Wilderness

‡ Use level was defined independently by each forest by defining the expected number of recreation visitors that would be last-exiting a site or area on a given day. The forest developed the range for very high, high, medium, and low and then assigned each day of the year to one of the use levels.

§ Proxy Code - If the site or area already had counts of use (such as fee envelopes or ski lift tickets) the site was called a proxy site and sampled independent of nonproxy sites.

Site Days are days that a recreation site or area is open to the public for recreation purposes.

& 0.0 - This value is less than five one-hundredths.

2.2. Visitation Estimates

Visitation estimates are available at the national, regional, and forest level. This document provides only National Forest level data. Other documents may be obtained through the National Visitor Use Monitoring web page: www.fs.fed.us/recreation/programs/nvum.

When reviewing the results, users should discuss with forest staff if this forest experienced any unusual circumstances such as forest fires, floods, or atypical weather that may have created an unusual recreation use pattern for the year sampled. Table 2 displays the number of national forest visits and site visits by site type for this National Forest.

Table 2. Annual Visitation Estimate

Visit Type	Visits (1,000s)	90% Confidence Level (%)#
Total Estimated Site Visits*	671	±22.8
→ Day Use Developed Site Visits	104	±22.3
→ Overnight Use Developed Site Visits	120	±10.3
→ General Forest Area Visits	439	±34.2
→ Designated Wilderness Visits†	7	±35.4
Total Estimated National Forest Visits§	526	±25.2
→ Special Events and Organized Camp Use‡	7	±0.0

* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Designated Wilderness visits are included in the Site Visits estimate.

‡ Special events and organizational camp use are not included in the Site Visit estimate, only in the National Forest Visits estimate. Forests reported the total number of participants and observers so this number is not estimated; it is treated as 100% accurate.

§ A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

This value defines the upper and lower bounds of the visitation estimate at the 90% confidence level, for example if the visitation estimate is 100 +/-5%, one would say “at the 90% confidence level visitation is between 95 and 105 visits.”

The quality of the use estimate is based in part on how many individuals were contacted during the sample day and how many complete interviews were obtained from which to estimate NVUM numbers and visitor descriptions. Table 3 and Table 4 display the number of visitor contacts, number of completed interviews by site type and survey form type. This information may be useful to managers when assessing how representative of all visitors the information in this report may be.

Table 3. Number of Individuals Contacted by Site Type

Site Type	Total Individuals Contacted	Individuals Who Agreed to be Interviewed	Recreating Individuals Who Are Leaving for the Last Time That Day
Day Use Developed Sites	455	352	250
Overnight Use Developed Sites	341	284	110
Undeveloped Areas (GFAs)	353	315	107
Designated Wilderness	115	100	71
Total	**1,264**	**1,051**	**538**

Table 4. Number of Complete Interviews* by Site Type and Form Type

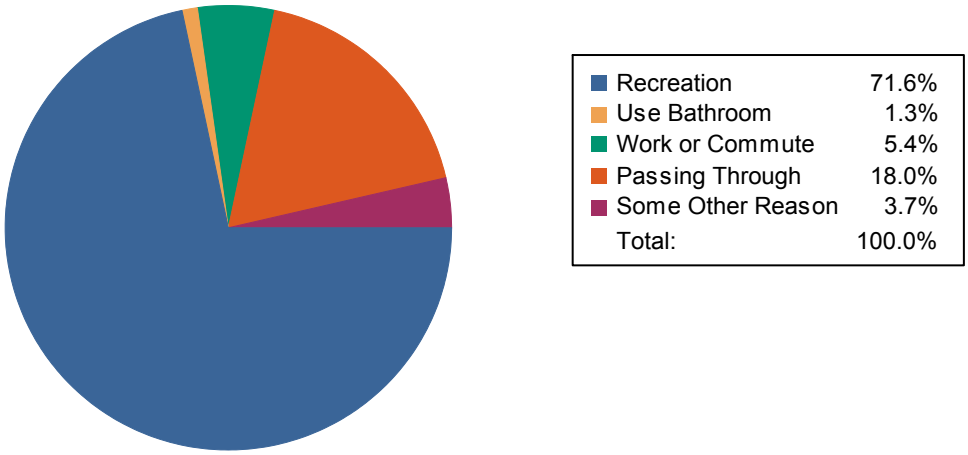
Form Type†	Developed Day Use Site	Developed Overnight	Undeveloped Areas (GFAs)	Wilderness	Total
Basic	97	43	39	27	206
Economic	84	37	36	21	178
Satisfaction	69	30	32	23	154
Total	**250**	**110**	**107**	**71**	**538**

* Complete interviews are those in which the individual contacted agreed to be interviewed, was recreating on the national forest and was exiting the site or area for the last time that day.

† Form type is the type of interview form administered to the visitor. The Basic form did not ask either economic or satisfaction questions. The Satisfaction form did not ask economic questions and the Economic form did not ask satisfaction questions.

Visitors were interviewed regardless of whether they were recreating at the site or not, however the interview was discontinued after determining that the reason for visiting the site was not recreation. Figure 1 displays the various reasons visitors gave as their purpose for stopping at the sample site.

Figure 1. Purpose of Visit by Visitors Who Agreed to be Interviewed



3. DESCRIPTION OF THE RECREATION VISIT

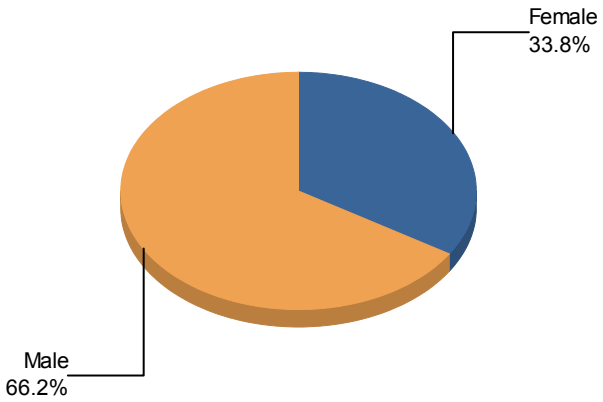
3.1. Demographics

Descriptions of forest recreational visits were developed based upon the characteristics of interviewed visitors (respondents) and expanded to the national forest visitor population. Basic demographic information helps forest managers identify the profile of the visitors they serve. Management concerns such as providing recreation opportunities for underserved populations may be monitored with this information. Table 5, Table 6 and Table 7 provide basic demographic information about visitors interviewed regarding Gender, Race/Ethnicity, and Age, respectively. Table 8 shows the 15 most common reported origins for recreation visitors. A complete list of reported zip codes for respondents is found in Appendix A. Table 9 provides information about self reported travel distance from home to the interview site.

Demographic results show that not quite 34 percent of visits are made by females. Among racial and ethnic minorities, the most commonly encountered are Hispanics (4.7%) and Asian (3.5%). The age distribution shows that the Plumas has relatively higher proportions of both children under the age of 16 (20.5%) and people over the age of 60 (22.7%) than do most forests. A good deal of visitation is local. Fifty-five percent of visits come from people who live within 50 miles of the forest. Another 12 percent come from people in the 50 – 75 mile distance zone.

Table 5. Percent of National Forest Visits* by Gender

Gender	Survey Respondents†	National Forest Visits (%)‡
Female	489	33.8
Male	687	66.2
Total	**1,176**	**100.0**



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

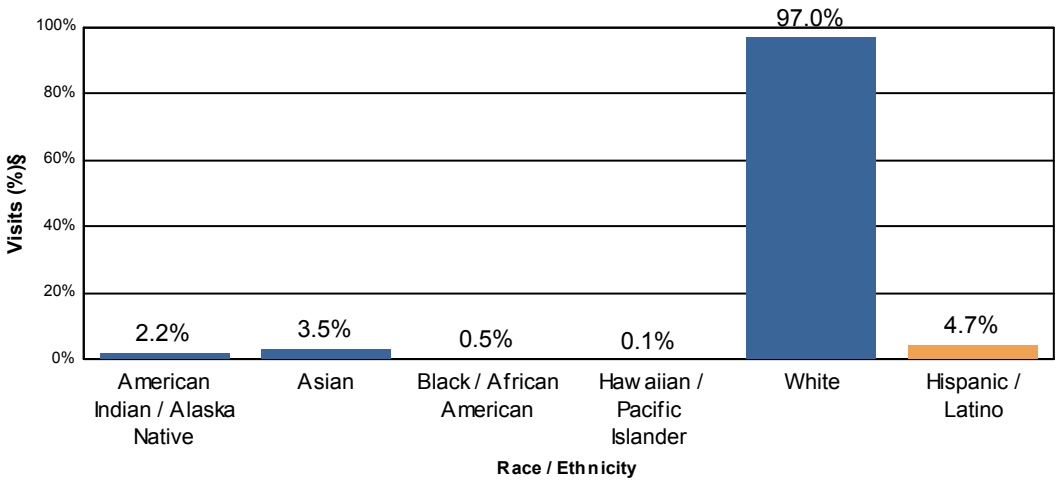
† Non-respondents to gender questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 6. Percent of National Forest Visits* by Race/Ethnicity

Race †	Survey Respondents‡	National Forest Visits (%)§
American Indian / Alaska Native	28	2.2
Asian	8	3.5
Black / African American	3	0.5
Hawaiian / Pacific Islander	2	0.1
White	461	97.0
Total	502	103.3#

Ethnicity†	Survey Respondents‡	National Forest Visits (%)§
Hispanic / Latino	28	4.7



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

Respondents could choose more than one racial group, so the total may be more than 100%.

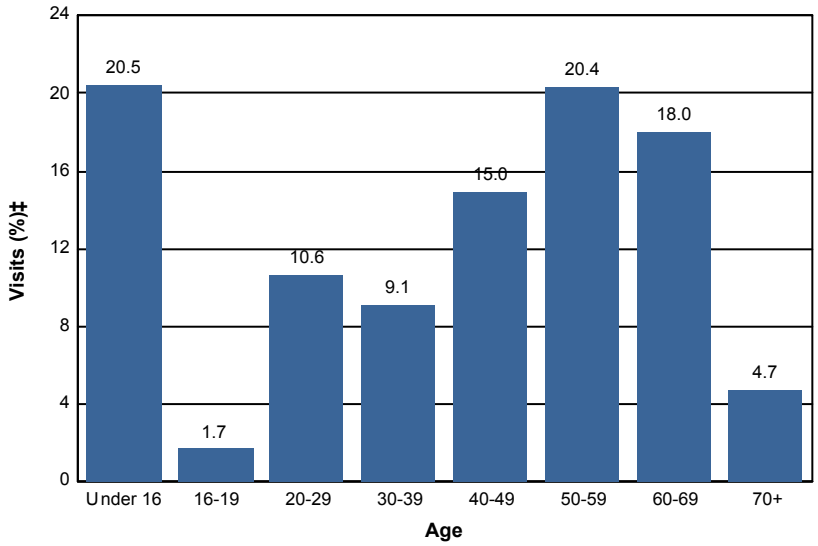
† Race and Ethnicity were asked as two separate questions.

‡ Non-respondents to race/ethnicity questions were excluded from analysis.

§ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 7. Percent of National Forest Visits* by Age

Age Class	National Forest Visits (%)‡
Under 16	20.5
16-19	1.7
20-29	10.6
30-39	9.1
40-49	15.0
50-59	20.4
60-69	18.0
70+	4.7
Total	**100.0**



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Non-respondents to age questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Table 8. Top 15 Most Commonly Reported ZIP Codes, States and Counties of National Forest Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
95971	California	Plumas County	22.6	42
96130	California	Lassen County	8.6	16
95916	California	Butte County	8.6	16
89436	Nevada	Washoe County	6.5	12
96137	California	Lassen County	6.5	12
95966	California	Butte County	6.5	12
95947	California	Plumas County	5.4	10
96122	California	Plumas County	5.4	10
89506	Nevada	Washoe County	5.4	10
95956	California	Plumas County	4.8	9
95973	California	Butte County	4.3	8
95926	California	Butte County	4.3	8
89509	Nevada	Washoe County	3.8	7
89511	Nevada	Washoe County	3.8	7
95969	California	Butte County	3.8	7

* Includes respondents reporting no ZIP code or an invalid ZIP code.

Table 9. Percent of National Forest Visits* by Distance Traveled

Miles from Survey Respondent's Home to Interview Location†	National Forest Visits (%)
0 - 25 miles	26.8
26 - 50 miles	28.5
51 - 75 miles	12.1
76 - 100 miles	7.6
101 - 200 miles	13.3
201 - 500 miles	10.3
Over 500 miles	1.4
Total	100.0

Note: Blank cells indicate that insufficient data were collected to make inferences.

* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Travel distance is self-reported.

3.2. Visit Descriptions

Characteristics of the recreation visit such as length of visit, types of sites visited, activity participation and visitor satisfaction with forest facilities and services help managers understand recreation use patterns and use of facilities. This allows them to plan workforce and facility needs. The average national forest visit length of stay and average site visit length of stay by site type on this forest is displayed in Table 10. Since the average values displayed in Table 10 may be influenced by a few people staying a very long time, the median value is also shown.

Most visits to the Plumas last not more than about a half day. Over half of the visits last at most 6 hours. The median length of visit to overnight sites is about 50 hours, or about 2 days. The average Wilderness visit lasts only about 4 hours, although more than half of those visits are shorter than 2.5 hours long. Just over 90 percent of visits involve recreating at just one location on the forest. Most visits come from people who are infrequent visitors. About half of visits are made by people who visit the Plumas at most 5 times per year. However, there is also a core of frequent users; about sixteen percent (one out of every six) come from people who visit more than 50 times per year.

Table 10. Visit Duration

Visit Type	Average Duration (hours)‡	Median Duration (hours)‡
Site Visit	21.2	5.0
Day Use Developed	3.0	2.2
Overnight Use Developed	69.1	50.7
Undeveloped Areas	11.1	4.9
Designated Wilderness	3.8	2.2
National Forest Visit	26.3	5.6

* A Site Visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time. Sites and areas were divided into four site types as listed here.

† A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

‡ If this variable is blank not enough surveys were collected to make inferences.

Many of the respondents on this National Forest went only to the site at which they were interviewed (Table 11). Some visitors went to more than one recreation site or area during their national forest visit and the average site visits per national forest visit is shown below. Also displayed are the average people per vehicle and average axles per vehicle. This information in conjunction with traffic counts was used to expand observations from individual interviews to the full forest population of recreation visitors. This information may be useful to forest engineers and others who use vehicle counters to conduct traffic studies.

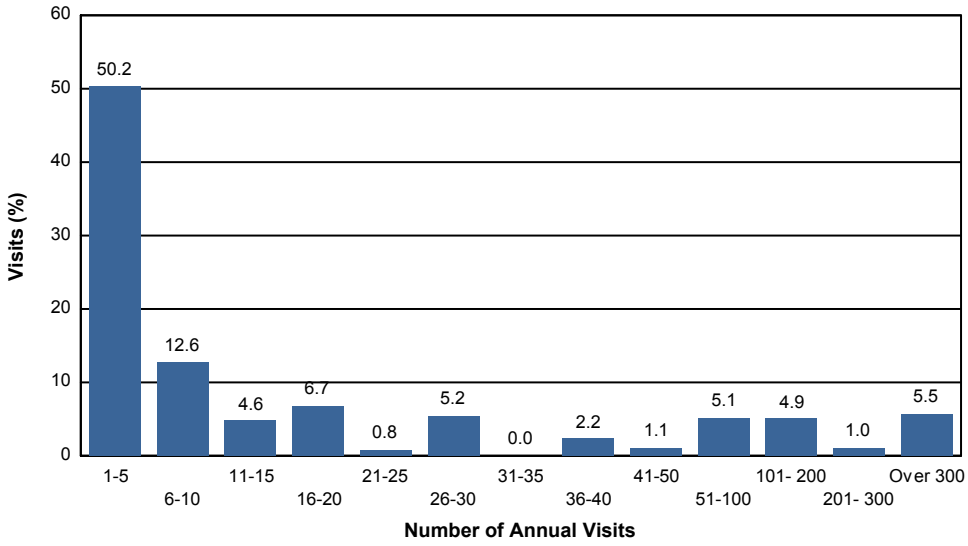
During the interview, visitors were asked how often they visit this national forest for all recreational activities, and how often for their primary activity. Table 12 summarizes the percent of visits that are made by those in each frequency category for this National Forest.

Table 11. Group Characteristics

Characteristic	Average
Percent of visits that were to just one national forest site during the National Forest Visit*	86.7
Number of national forest sites visited on National Forest Visit*	1.2
Group Size	2.4
Axles per Vehicle	2.5

Table 12. Percent of National Forest Visits* by Annual Visit Frequency

Number of Annual Visits	Visits (%)†	Cumulative Visits (%)
1 - 5	50.2	50.2
6 - 10	12.6	62.8
11 - 15	4.6	67.4
16 - 20	6.7	74.2
21 - 25	0.8	74.9
26 - 30	5.2	80.2
31 - 35	0.0	80.2
36 - 40	2.2	82.4
41 - 50	1.1	83.5
51 - 100	5.1	88.6
101 - 200	4.9	93.5
201 - 300	1.0	94.5
Over 300	5.5	100.0



* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† The first row indicates the percent of National Forest Visits made by persons who visit 1 to 5 times per year. The last row indicates the percent of National Forest Visits made by persons who visit more than 300 times per year.

3.3. Activities

After identifying their main recreational activity, visitors were asked how many hours they spent participating in that main activity during this national forest visit. Some caution is needed when using this information. Because most national forest visitors participate in several recreation activities during each visit, it is more than likely that other visitors also participated in this activity, but did not identify it as their main activity. For example, on one national forest 63 % of visitors identified viewing wildlife as a recreational activity that they participated in during this visit, however only 3% identified that activity as their main recreational activity. The information on average hours viewing wildlife is only for the 3% who reported it as a main activity.

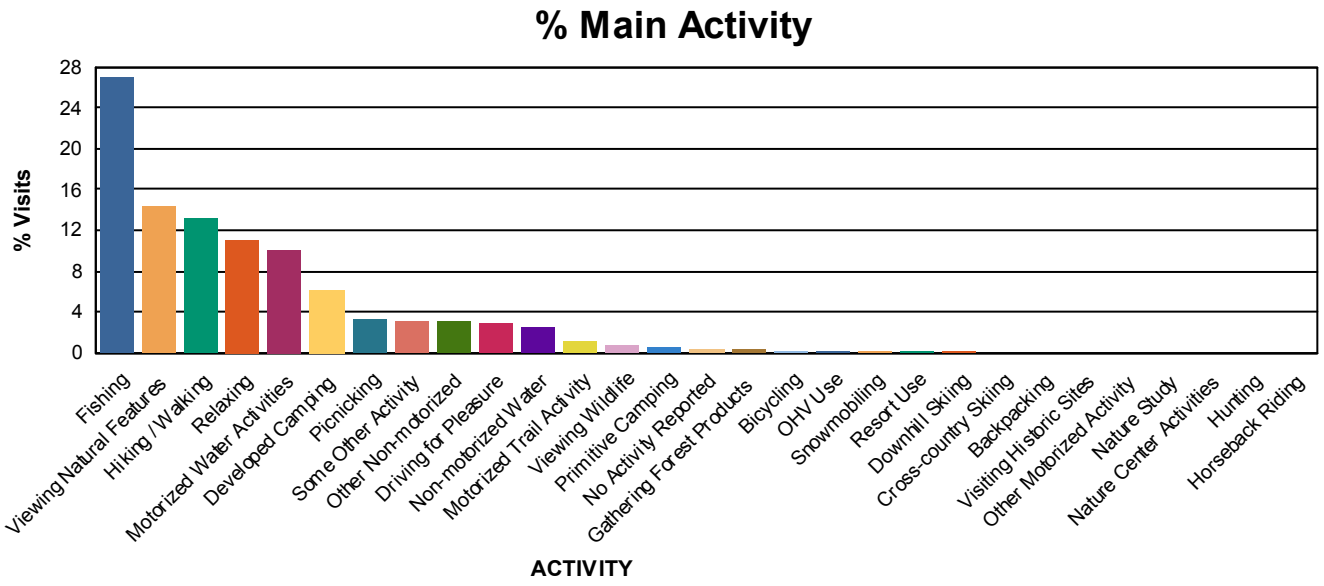
The most frequently reported primary activity is fishing (27%), followed by view2ing natural featurs (14%), hiking (13%), relaxing (11%) and motorized water activities (10%). Over 40 percent of the visits report participating in relaxing and viewing scenery.

Use of Constructed Facilities and Designated Areas

About one-third of recreation visitors interviewed were asked about whether they made use of a targeted set of facilities and special designated areas during their visit. These results are displayed in Table 14.

Table 13. Activity Participation

Activity	% Participation*	% Main Activity‡	Avg Hours Doing Main Activity
Relaxing	44.7	11.0	41.6
Viewing Natural Features	43.7	14.3	2.6
Hiking / Walking	38.2	13.2	5.2
Fishing	37.9	26.9	5.9
Viewing Wildlife	33.4	0.8	13.5
Motorized Water Activities	24.3	10.1	5.1
Developed Camping	23.3	6.1	52.8
Driving for Pleasure	20.8	2.8	1.7
Other Non-motorized	15.0	3.0	1.5
Picnicking	13.3	3.3	8.5
Non-motorized Water	10.4	2.4	4.0
Bicycling	4.7	0.2	2.8
Some Other Activity	4.5	3.1	5.2
Gathering Forest Products	4.1	0.3	3.0
Nature Study	4.0	0.0	0.0
Visiting Historic Sites	3.8	0.0	0.0
Resort Use	3.7	0.1	44.5
Motorized Trail Activity	2.5	1.0	6.0
OHV Use	2.4	0.2	7.6
Nature Center Activities	1.6	0.0	0.0
Primitive Camping	1.1	0.5	39.7
Other Motorized Activity	0.8	0.0	0.0
Cross-country Skiing	0.6	0.0	2.0
Backpacking	0.5	0.0	96.0
Hunting	0.4	0.0	0.0
No Activity Reported	0.4	0.4	
Horseback Riding	0.3	0.0	0.0
Snowmobiling	0.2	0.1	2.0
Downhill Skiing	0.2	0.1	2.0



* Survey respondents could select multiple activities so this column may total more than 100%.

‡ Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

Table 14. Percent of National Forest Visits* Indicating Use of Special Facilities or Areas

Special Facility or Area	% of National Forest Visits†
Developed Swimming Site	33.1
Scenic Byway	34.8
Visitor Center or Museum	9.3
Designated ORV Area	4.5
Forest Roads	5.8
Interpretive Displays	5.2
Information Sites	5.4
Developed Fishing Site	42.4
Motorized Single Track Trails	1.8
Motorized Dual Track Trails	2.5
None of these Facilities	28.6

* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Survey respondents could select as many or as few special facilities or areas as appropriate.

4. ECONOMIC INFORMATION

Forest managers are usually very interested in the impact of National Forest recreation visits on the local economy. As commodity production of timber and other resources has declined, local communities look increasingly to tourism to support their communities. When considering recreation-related visitor spending managers are often interested both in identifying the average spending of individual visitors (or types of visitors) and the total spending associated with all recreation use. Spending averages for visitors or visitor parties can be estimated using data collected from a statistically valid visitor sampling program such as NVUM. To estimate the total spending associated with recreation use, three pieces of information are needed: an overall visitation estimate, the proportion of visits in the visitor types, and the average spending profiles for each of the visitor types. Multiplying the three gives a total amount of spending by a particular type of visitor. Summing over all visitor types gives total spending.

About one-third of the NVUM surveys included questions about trip-related spending within 50 miles of the site visited. Spending data collected from 2000 to 2003 were analyzed at Michigan State University by Dr. Daniel Stynes and Dr. Eric White. A description of that analysis and the results are in the report “Spending Profiles of National Forest Visitors: NVUM four-year report”, available at http://www.fs.fed.us/recreation/programs/nvum/NVUM4YrSpending.pdf. Analysis of spending data for the 2005 - 2009 data collection periods was completed in summer of 2010.

4.1. Spending Segments

The spending that occurs on a recreation trip is greatly influenced by the type of recreation trip taken. For example, visitors on overnight trips away from home typically have to pay for some form of lodging (e.g., hotel/motel rooms, fees in a developed campground, etc.) while those on day trips do not. In addition, visitors on overnight trips will generally have to purchase more food during their trip (in restaurants or grocery stores) than visitors on day trips. Visitors who have not traveled far from home to the recreation location usually spend less than visitors traveling longer distances, especially on items such as fuel and food. Analysis of spending patterns has shown that a good way to construct segments of the visitor market with consistent spending patterns is the following seven groupings:

1. local visitors on day trips,
2. local visitors on overnight trips staying in lodging on the national forest,
3. local visitors on overnight trips staying in lodging off the national forest, and
4. non-local visitors on day trips,
5. non-local visitors on overnight trips staying in lodging on the national forest,
6. non-local visitors on overnight trips staying in lodging off the forest,
7. non-primary visitors.

Local visitors are those who travel less than 50 road miles from home to the recreation site visited and non-local visitors are those who travel greater than 50 road miles to the recreation site visited. Non-primary visitors are those for whom the primary purpose of their trip is something other than recreating on that national forest. Table 15 shows the distribution of visits by spending segment.

Nearly half of all visits are local area residents on day trips away from home (47%). Non-local

residents on day trips account for another 8 percent of visits. For about 6 percent of visits, the Plumas is a side trip on part of a trip to some other primary destination location. Because of these percentages, the spending amounts are relatively low. About half of the visiting parties spend not more than $70 per party per trip. The income distribution results show that over 40% of all visits come from people in households who make less than $50,000 per year.

Table 15. Distribution of National Forest Visits* by Market Segment†

	Non-Local Segments			Local Segments				
	Day	Overnight on NF	Overnight off NF	Day	Overnight on NF	Overnight off NF	Non-Primary‡	Total
Number of National Forest Visits								
Percent of National Forest Visits								

* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† The market segments shown here relate to the type of recreation trip taken. A recreation trip is defined as the duration of time beginning when the visitor left their home and ending when they got back to their home. “Non-local” trips are those where the individual(s) traveled greater than approximately 50 miles from home to the site visited. “Day” trips do not involve an overnight stay outside the home, “overnight on-forest” trips are those with an overnight stay outside the home on National Forest System (NFS) land, and “overnight off-forest” trips are those with an overnight stay outside the home off National Forest System land.

‡ “Non-primary” trips are those where the primary recreation destination of the trip was somewhere other than the national forest under consideration.

Individuals are urged to consult an economist when interpreting the NVUM economic tables.

4.2. Spending Profiles

Spending profiles for each segment for this forest can be found in the Stynes and White report noted above. Appendix Table A-1 in that report identifies whether the forest has a high-spending profile (Table 7 of Stynes and White), an average profile (Table 5), or a low-spending profile (Table 8). It is essential to note that these spending profiles are in dollars spent per **party**. Obtaining per-visit spending is accomplished by dividing the spending for each segment by the average people per party for the forest and segment found in Appendix Table A-3 of that report.

4.3. Total Direct Spending

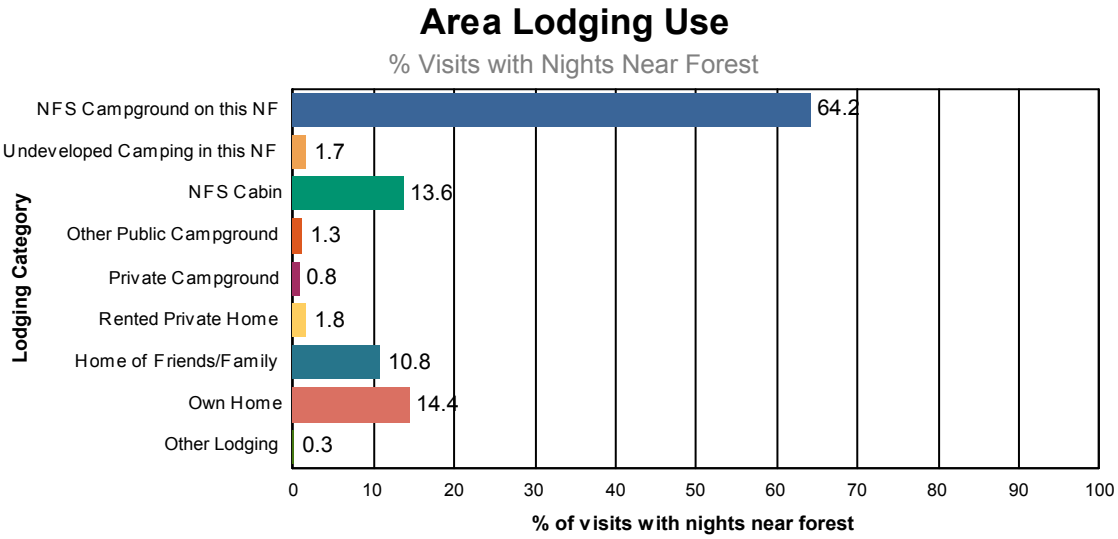
Total direct spending made within 50 miles of the forest and associated with national forest recreation is calculated by combining estimates of per-visit spending averages from the spending profiles with estimates of the number of national forest visits in the segment. The number of visits in the segment equals the percentage in Table 15 times the number of National Forest visits reported in Table 2.

4.4. Other Visit Information

There are several other important aspects of the trips on which the recreation visits to the forest are made. These are summarized in Table 16. The first aspect relates to total amount spent by the recreating party on the trip. This includes spending not just within 50 miles of the forest, but anywhere. The table shows both the average and the median. Another set describes the overall length of the trips on which the visits are made. The table shows the percent of the visits that were made on trips where the person stayed away from home overnight (even though the forest visit may be just a day visit), and the average total nights away from home and nights spent within 50 miles of the forest. For those spending one or more nights in or near the forest, the table shows the percentage that selected each of a series of lodging options. Together, these results help show the context of overall trip length and lodging patterns for visitors to the forest.

Table 16. Trip Spending and Lodging Usage

Trip Spending	Value
Average Total Trip Spending per Party	$160
Median Total Trip Spending per Party	$70
% NF Visits made on trip with overnight stay away from home	38.0%
% NF Visits with overnight stay within 50 miles of NF	36.4%
Mean nights/visit within 50 miles of NF	3.3
Area Lodging Use	**% Visits with Nights Near Forest**
NFS Campground on this NF	64.2%
Undeveloped Camping in this NF	1.7%
NFS Cabin	13.6%
Other Public Campground	1.3%
Private Campground	0.8%
Rented Private Home	1.8%
Home of Friends/Family	10.8%
Own Home	14.4%
Other Lodging	0.3%



4.5. Household Income

Visitors were asked to report a general category for their total household income. Only very general categories were used, to minimize the intrusive nature of the question. Results help indicate the overall socio-economic status of visitors to the forest, and are found in Table 17.

Table 17. Percent of National Forest Visits* by Annual Household Income

Annual Household Income Category	National Forest Visits (%)
Under $25,000	17.2
$25,000 to $49,999	22.9
$50,000 to $74,999	14.9
$75,000 to $99,999	17.0
$100,000 to $149,999	12.5
$150,000 and up	15.5
Total	100.0

* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

4.6. Substitute Behavior

Visitors were asked to select one of several substitute choices, if for some reason they were unable to visit this national forest (Figure 3). Choices included going somewhere else for the same activity they did on the current trip, coming back to this forest for the same activity at some later time, going someplace else for a different activity, staying at home and not making a recreation trip, going to work instead of recreating, and a residual 'other' category. On most forests, the majority of visitors indicate that their substitute behavior choice is activity driven (going elsewhere for same activity) and a smaller percentage indicate they would come back later to this national forest for the same activity. For those visitors who said they would have gone somewhere else for recreation they were asked how far from their home this alternate destination was. These results are shown in Figure 4.

Figure 3. Substitute Behavior Choices

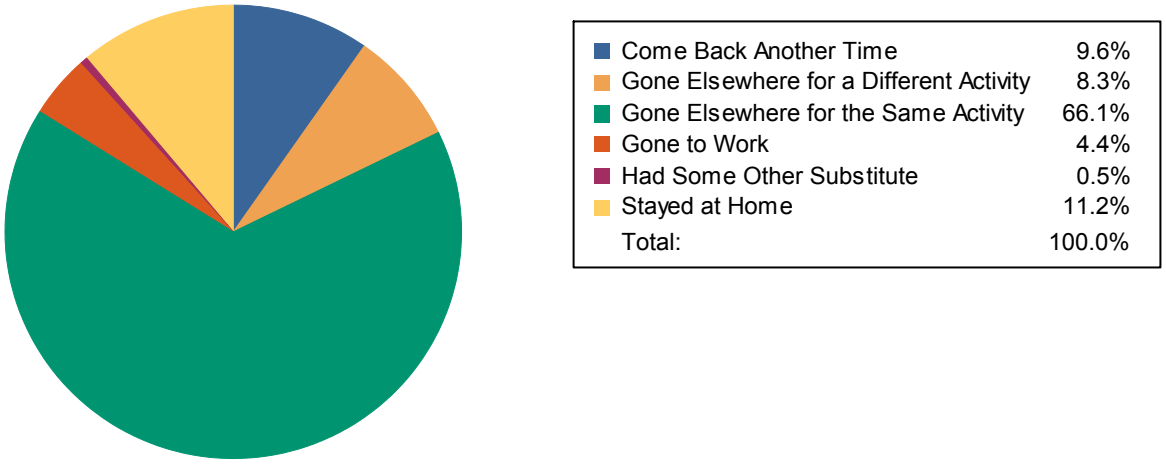
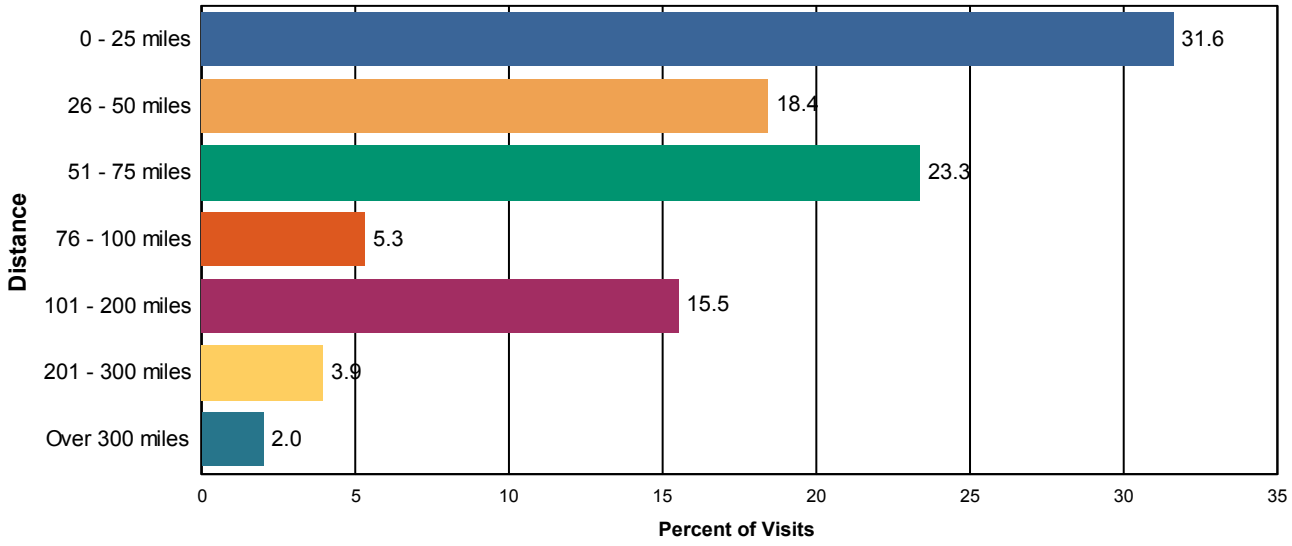


Figure 4. Reported Distance Visitors Would Travel to Alternate Location



5. SATISFACTION INFORMATION

An important element of outdoor recreation program delivery is evaluating customer satisfaction with the recreation setting, facilities, and services provided. Satisfaction information helps managers decide where to invest in resources and to allocate resources more efficiently toward improving customer satisfaction. Satisfaction is a core piece of data for national- and forest-level performance measures. To describe customer satisfaction, several different measures are used. Recreation visitors were asked to provide an overall rating of their visit to the national forest, on a 5-point Likert scale. About one-third of visitors interviewed on the forest rated their satisfaction with fourteen elements related to recreation facilities and services, and the importance of those elements to their recreation experience. Visitors were asked to rate the specific site or area at which they were interviewed. Visitors rated both the importance and performance (satisfaction with) of these elements using a 5-point scale. The Likert scale for importance ranged from not important to very important. The Likert scale for performance ranged from very dissatisfied to very satisfied. Although the satisfaction ratings specifically referenced the area where the visitor was interviewed, the survey design does not usually have enough responses for any individual site or area on the forest to present information at a site level. Rather, the information is generalized to overall satisfaction within the three site types: Day Use Developed (DUDS), Overnight Use Developed (OUDS), General Forest Areas, and on the forest as a whole.

The satisfaction responses are analyzed in several ways. First, a graph of overall satisfaction is presented in Figure 5. Next, two aggregate measures were calculated from the set of individual elements. The satisfaction elements most readily controlled by managers were aggregated into four categories: developed facilities, access, services, and visitor safety. The site types sampled were aggregated into three groups: developed sites (includes both day use and overnight developed sites), dispersed areas, and designated Wilderness. The first aggregate measure is called “Percent Satisfied Index (PSI)”, which is the proportion of all ratings for the elements in the category where the satisfaction ratings had a numerical rating of 4 or 5. Conceptually, the PSI indicator shows the percent of all recreation customers who are satisfied with agency performance. The agency’s national target for this measure is 85%. It is usually difficult to consistently have a higher satisfaction score than 85% since given tradeoffs among user groups and other factors. Table 18 displays the aggregate PSI scores for this forest.

Another aggregate measure of satisfaction is called “Percent Meet Expectations (PME)”. This is the proportion of satisfaction ratings in which the numerical satisfaction rating for a particular element is equal to or greater than the importance rating for that element. This indicator tracks the congruence between the agency’s performance and customer evaluations of importance. The idea behind this measure is that those elements with higher importance levels must have higher performance levels. Figure 6 displays the PME scores by type of site. Lower scores indicate a gap between desires and performance.

An Importance-Performance Analysis (IPA) (Hudson, et al, Feb 2004) was calculated for the importance and satisfaction scores. A target level of importance and performance divides the possible set of score pairs into four quadrants. For this work, the target level of both was a numerical score of 4.0. Each quadrant has a title that helps in interpreting responses that fall into it, and that provides some general guidance for management. These can be described as:

1. Importance at or above 4.0, Satisfaction at or above 4.0: **Keep up the good work**. These are items that are important to visitors and ones that the forest is performing quite well;
2. Importance at or above 4.0, Satisfaction under 4.0: **Concentrate here**. These are important items to the public, but performance is not where it needs to be. Increasing effort here is likely to have the greatest payoff in overall customer satisfaction;
3. Importance below 4.0, Satisfaction above 4.0: **Possible overkill**. These are items that are not highly important to visitors, but the forest's performance is quite good. It may be possible to reduce effort here without greatly harming overall satisfaction;
4. Importance below 4.0; Satisfaction below 4.0: **Low Priority**. These are items where performance is not very good, but neither are they important to visitors. Focusing effort here is unlikely to have a great impact.

We present tables that show the I-P rating title for each satisfaction element. Each sitetype is presented in a separate table. Results are presented in Tables 19 - 22.

The numerical scores for visitor satisfaction and importance for each element by site type, and the sample sizes for each are presented in Appendix B (Tables B1 - B4). Most managers find it difficult to discern meaning from these raw tables; however they may wish to examine specific elements once they have reviewed the other satisfaction information presented in this section. Note that if an element had fewer than 10 responses no analyses are performed, as there are too few responses to provide reliable information. Finally, visitors were asked about their overall satisfaction with and the importance of road condition and the adequacy of signage. Figure 7a and Figure 7b show the results.

The overall satisfaction results are exceptionally high. Eighty-three percent of people visiting indicated they were very satisfied with their overall recreation experience. Another fourteen percent were somewhat satisfied. Less than 2 percent expressed any level of dissatisfaction. The results for the composite indices were somewhat lower. Satisfaction ratings for perception of safety were over ninety percent for all types of sites. Ratings for access items were above 85 percent for all types of sites. However ratings for the services composite was much lower.

Figure 5. Percent of National Forest Visits by Overall Satisfaction Rating

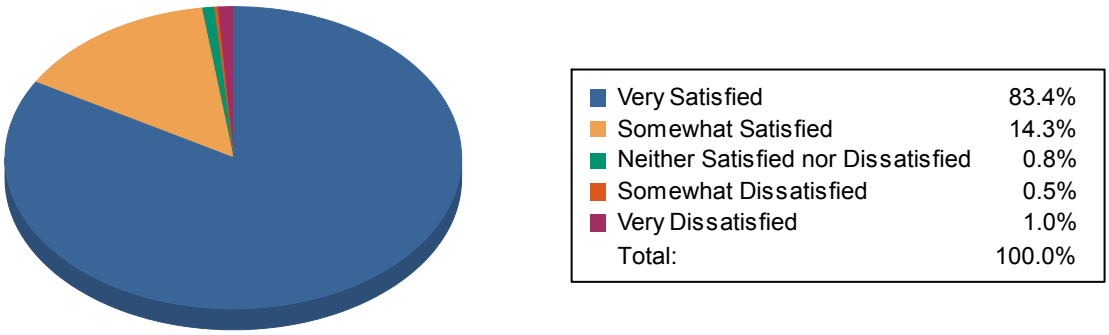


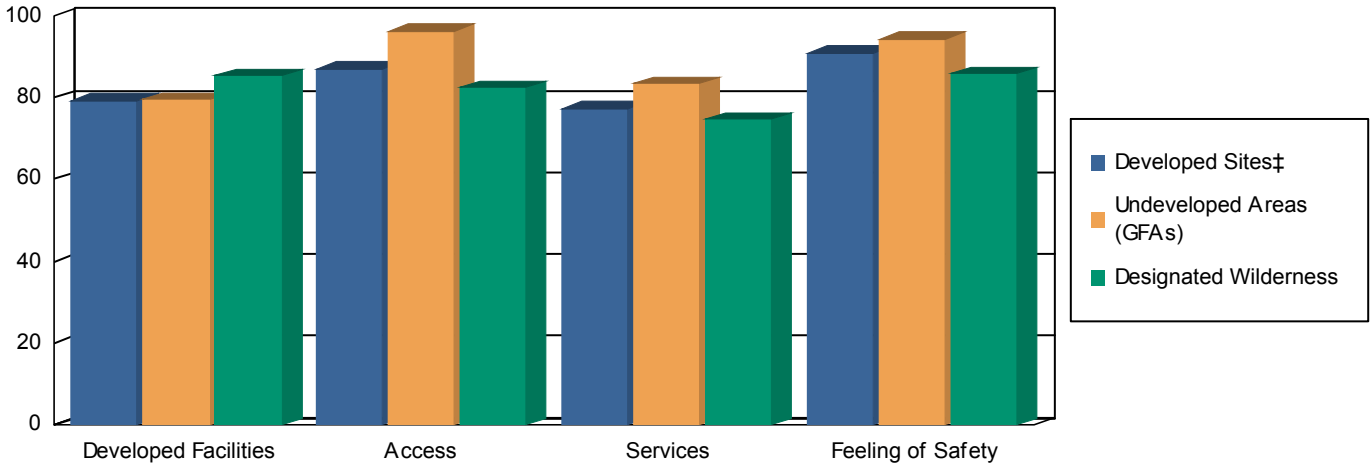
Table 18. Percent Satisfied Index† Scores for Aggregate Categories

Satisfaction Element	Satisfied Survey Respondents (%)		
	Developed Sites‡	Undeveloped Areas (GFAs)	Designated Wilderness
Developed Facilities	87.5	84.4	96.1
Access	89.0	92.7	87.1
Services	80.9	75.6	56.5
Feeling of Safety	99.3	90.1	97.3

† This is a composite rating. It is the proportion of satisfaction ratings scored by visitors as good (4) or very good (5). Computed as the percentage of all ratings for the elements within the sub grouping that are at or above the target level, and indicates the percent of all visitors that are reasonably well satisfied with agency performance.

‡ This category includes both Day Use and Overnight Use Developed Sites.

Figure 6. Percent Meets Expectations Scores*



* “Percent Meet Expectations (PME)” is the proportion of satisfaction ratings in which the numerical satisfaction rating for a particular element is equal to or greater than the importance rating for that element. This indicator tracks the congruence between the agency’s performance and customer evaluations of importance. The idea behind this measure is that those elements with higher importance levels must have higher performance levels. Lower scores indicate a gap between desires and performance.

‡ This category includes both Day Use and Overnight Use Developed Sites.

Table 19. Importance-Performance Ratings for Day Use Developed Sites

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	Concentrate Here
Developed Facilities	Keep up the Good Work
Condition of Environment	Keep up the Good Work
Employee Helpfulness	Keep up the Good Work
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Keep up the Good Work
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Keep up the Good Work
Trail Condition	Keep up the Good Work
Value for Fee Paid	Concentrate Here

Table 20. Importance-Performance Ratings for Overnight Developed Sites

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	Keep up the Good Work
Developed Facilities	Keep up the Good Work
Condition of Environment	Keep up the Good Work
Employee Helpfulness	Keep up the Good Work
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Concentrate Here
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Keep up the Good Work
Trail Condition	Keep up the Good Work
Value for Fee Paid	Keep up the Good Work

Table 21. Importance-Performance Ratings for Undeveloped Areas (GFAs)

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	Concentrate Here
Developed Facilities	Keep up the Good Work
Condition of Environment	Keep up the Good Work
Employee Helpfulness	*
Interpretive Displays	Keep up the Good Work
Parking Availability	Keep up the Good Work
Parking Lot Condition	Keep up the Good Work
Rec. Info. Availability	Keep up the Good Work
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Keep up the Good Work
Trail Condition	Keep up the Good Work
Value for Fee Paid	Keep up the Good Work

* The data was not reported for items with fewer than 10 responses.

Table 22. Importance-Performance Ratings for Designated Wilderness

Satisfaction Element	Importance-Performance Rating
Restroom Cleanliness	*
Developed Facilities	*
Condition of Environment	Keep up the Good Work
Employee Helpfulness	*
Interpretive Displays	Low Priority
Parking Availability	Keep up the Good Work
Parking Lot Condition	Possible Overkill
Rec. Info. Availability	Concentrate Here
Road Condition	Keep up the Good Work
Feeling of Satefy	Keep up the Good Work
Scenery	Keep up the Good Work
Signage Adequacy	Concentrate Here
Trail Condition	Keep up the Good Work
Value for Fee Paid	*

* The data was not reported for items with fewer than 10 responses.

Figure 7a. Satisfaction with Forest-wide Road Conditions & Signage Adequacy

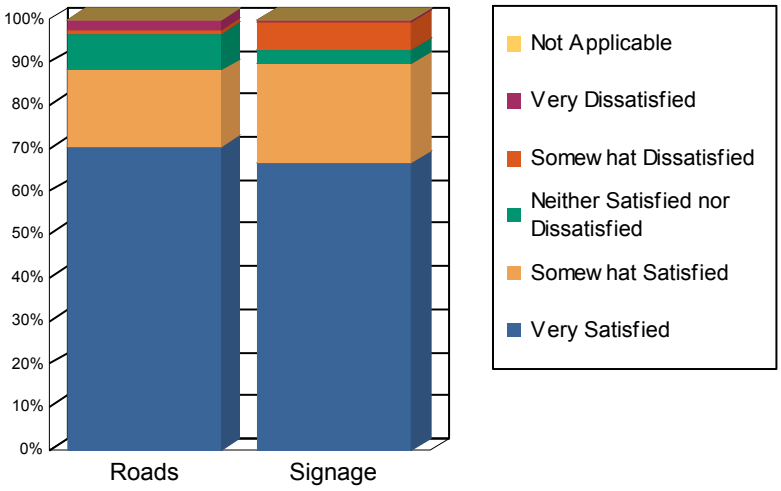
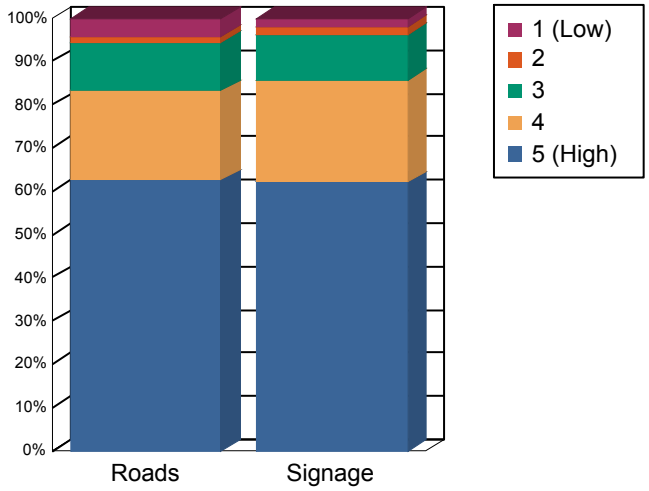


Figure 7b. Importance of Forest-wide Road Conditions & Signage Adequacy

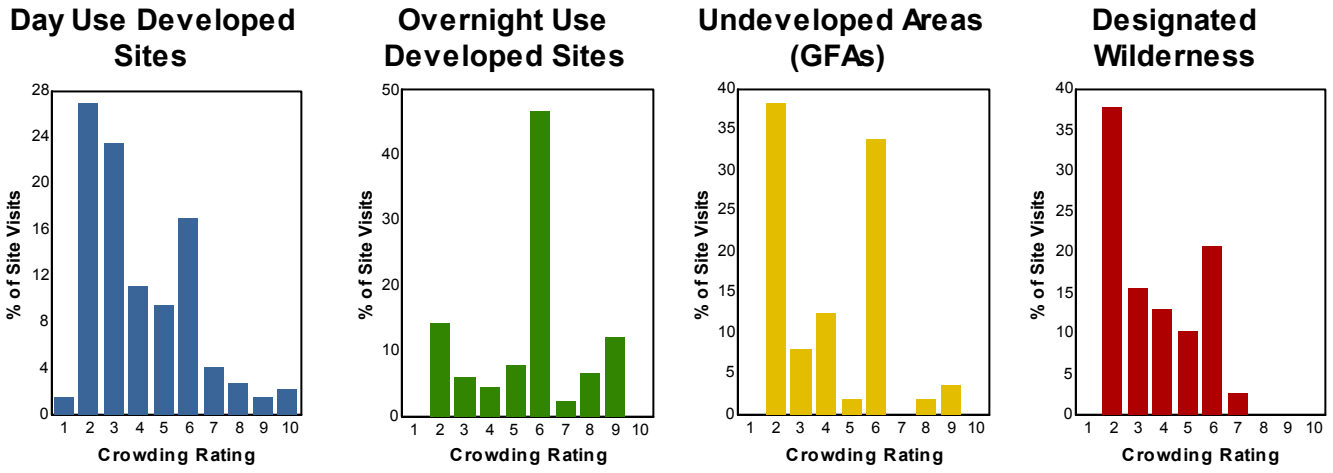


5.1. Crowding

Visitors rated their perception of how crowded the recreation site or area felt to them. This information is useful when looking at the type of site the visitor was using since someone visiting a designated Wilderness may think 5 people is too many while someone visiting a developed campground may think 200 people is about right. Table 23 shows the distribution of responses for each site type. Crowding was reported on a scale of 1 to 10 where 1 denotes hardly anyone was there, and a 10 indicates the area was perceived as overcrowded.

Table 23. Percent of Site Visits* by Crowding Rating and Site Type

Crowding Rating†	Site Types (% of Site Visits)			
	Day Use Developed Sites	Overnight Use Developed Sites	Undeveloped Areas (GFAs)	Designated Wilderness
10 - Overcrowded	2.2	0.0	0.0	0.0
9	1.5	12.2	3.7	0.0
8	2.7	6.7	1.9	0.0
7	4.2	2.3	0.0	2.7
6	16.9	46.6	34.0	20.9
5	9.5	7.7	1.9	10.2
4	11.1	4.3	12.3	12.8
3	23.5	6.1	8.0	15.5
2	26.9	14.1	38.3	38.0
1 - Hardly anyone there	1.5	0.0	0.0	0.0
Average Rating	**4.1**	**5.6**	**4.1**	**3.7**



* A Site Visit is the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time.

† Survey respondents rated how crowded the site or area they were interviewed at was using a scale of 1 to 10 where 1 meant hardly anyone was there and 10 meant the site or area was overcrowded.

5.2. Disabilities

Providing barrier-free facilities for recreation visitors is an important part of facility and service planning and development. One question asked if anyone in their group had a disability. If so, the visitor was then asked if the facilities at the sites they visited were accessible for this person (Table 24).

Table 24. Accessibility of National Forest Facilities by Persons with Disabilities

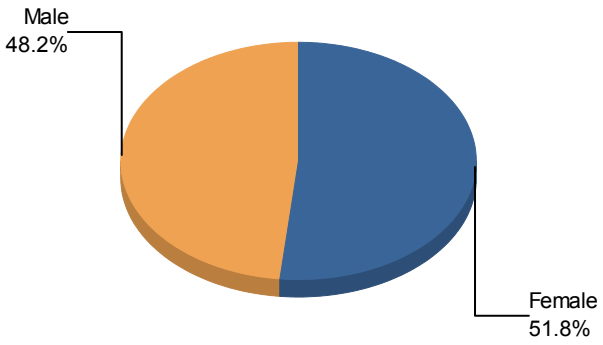
Item	Percent
% of visits that include a group member with a disability	11.6
Of this group, percent who said facilities at site visited were accessible	79.1

6. WILDERNESS VISIT DEMOGRAPHICS

Visits to Wilderness are sometimes made by a particular subset of the overall visitor population. In this chapter, tables are presented that describe the demographic characteristics of those who visit designated wilderness on this forest. Table 25 shows the gender breakdown, Table 26 the racial and ethnicity distribution, and the Table 27 age composition. In Table 28, a frequency analysis of Zip Codes obtained from respondents is presented, to give a rough idea of the common origins of Wilderness visitors.

Table 25. Percent of Wilderness Site Visits* by Gender

Gender	Survey Respondents†	Wilderness Site Visits (%)‡
Female	85	51.8
Male	73	48.2
Total	**158**	**100.0**



* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

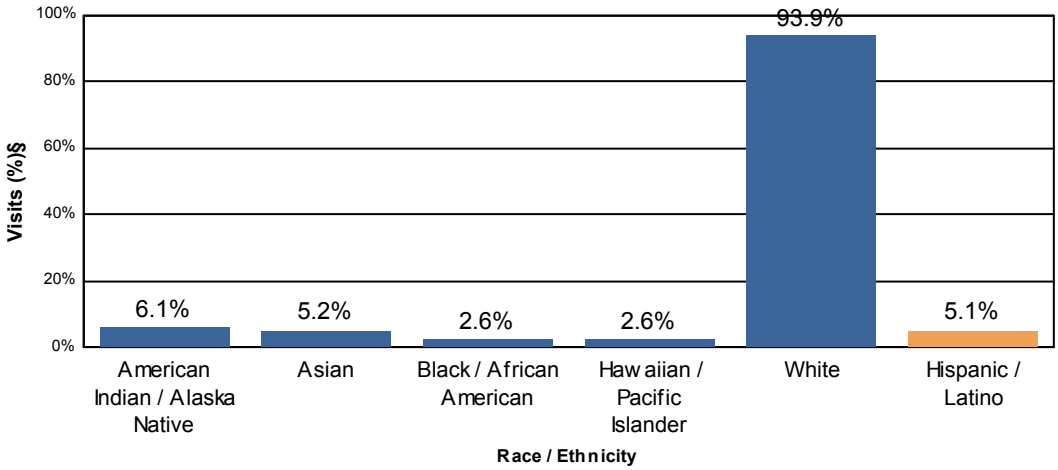
† Non-respondents to gender questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 26. Percent of Wilderness Site Visits* by Race/Ethnicity

Race †	Survey Respondents‡	Wilderness Site Visits (%)§
American Indian / Alaska Native	3	6.1
Asian	2	5.2
Black / African American	1	2.6
Hawaiian / Pacific Islander	1	2.6
White	62	93.9
Total	69	110.4#

Ethnicity†	Survey Respondents‡	Wilderness Site Visits (%)§
Hispanic / Latino	4	5.1



* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

Respondents could choose more than one racial group, so the total may be more than 100%.

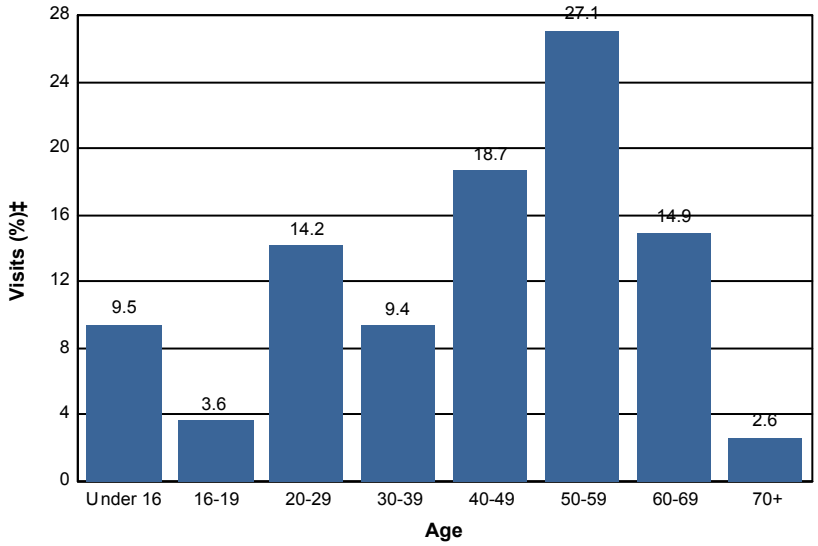
† Race and Ethnicity were asked as two separate questions.

‡ Non-respondents to race/ethnicity questions were excluded from analysis.

§ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 27. Percent of Wilderness Site Visits* by Age

Age Class	Wilderness Site Visits (%)‡
Under 16	9.5
16-19	3.6
20-29	14.2
30-39	9.4
40-49	18.7
50-59	27.1
60-69	14.9
70+	2.6
Total	**100.0**



* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Non-respondents to age questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of Wilderness Site Visits.

Table 28. Top 15 Most Commonly Reported ZIP Codes, States and Counties of Wilderness Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
95971	California	Plumas County	27.8	10
95956	California	Plumas County	22.2	8
89509	Nevada	Washoe County	8.3	3
95928	California	Butte County	5.6	2
95973	California	Butte County	5.6	2
95993	California	Sutter County	5.6	2
95934	California	Plumas County	2.8	1
90034	California	Los Angeles County	2.8	1
94941	California	Marin County	2.8	1
94806	California	Contra Costa County	2.8	1
88061	New Mexico	Grant County	2.8	1
95947	California	Plumas County	2.8	1
94598	California	Contra Costa County	2.8	1
90274	California	Los Angeles County	2.8	1
93422	California	San Luis Obispo County	2.8	1

* Includes respondents reporting no ZIP code or an invalid ZIP code.

7. APPENDIX TABLES

APPENDIX A - Complete List of ZIP Codes

Table A-1. ZIP Codes, States and Counties of National Forest Survey Respondents

ZIP Code	State	County	Percent of Respondents	Survey Respondents (n)
95971	California	Plumas County	7.8	42
96130	California	Lassen County	3.0	16
95916	California	Butte County	3.0	16
89436	Nevada	Washoe County	2.2	12
96137	California	Lassen County	2.2	12
95966	California	Butte County	2.2	12
95947	California	Plumas County	1.9	10
96122	California	Plumas County	1.9	10
89506	Nevada	Washoe County	1.9	10
95956	California	Plumas County	1.7	9
95973	California	Butte County	1.5	8
95926	California	Butte County	1.5	8
89509	Nevada	Washoe County	1.3	7
89511	Nevada	Washoe County	1.3	7
95969	California	Butte County	1.3	7
95954	California	Butte County	1.3	7
96114	California	Lassen County	1.1	6
96020	California	Plumas County	1.1	6
89502	Nevada	Washoe County	0.9	5
89521	Nevada	Washoe County	0.9	5
95965	California	Butte County	0.9	5
89508	Nevada	Washoe County	0.9	5
95928	California	Butte County	0.9	5
89433	Nevada	Washoe County	0.9	5
95901	California	Yuba County	0.7	4
96105	California	Plumas County	0.7	4
96103	California	Plumas County	0.7	4
96161	California	Nevada County	0.7	4
94533	California	Solano County	0.7	4
95923	California	Plumas County	0.7	4
95687	California	Solano County	0.6	3
95938	California	Butte County	0.6	3
89431	Nevada	Washoe County	0.6	3
94563	California	Contra Costa County	0.6	3
95983	California	Plumas County	0.6	3
95991	California	Sutter County	0.6	3
95949	California	Nevada County	0.6	3
89434	Nevada	Washoe County	0.6	3
94947	California	Marin County	0.6	3
96118	California	Sierra County	0.6	3

89512	Nevada	Washoe County	0.6	3
95835	California	Sacramento County	0.6	3
94523	California	Contra Costa County	0.6	3
89408	Nevada	Lyon County	0.6	3
94550	California	Alameda County	0.6	3
95993	California	Sutter County	0.6	3
95934	California	Plumas County	0.6	3
95982	California	Sutter County	0.4	2
Foreign Country			0.4	2
95945	California	Nevada County	0.4	2
93230	California	Kings County	0.4	2
95476	California	Sonoma County	0.4	2
90034	California	Los Angeles County	0.4	2
95023	California	San Benito County	0.4	2
94560	California	Alameda County	0.4	2
95765	California	Placer County	0.4	2
95472	California	Sonoma County	0.4	2
94402	California	San Mateo County	0.4	2
94065	California	San Mateo County	0.4	2
89503	Nevada	Washoe County	0.4	2
96106	California	Plumas County	0.4	2
95834	California	Sacramento County	0.4	2
89519	Nevada	Washoe County	0.4	2
95959	California	Nevada County	0.4	2
95661	California	Placer County	0.4	2
94558	California	Napa County	0.4	2
94903	California	Marin County	0.4	2
96113	California	Lassen County	0.4	2
93908	California	Monterey County	0.4	2
94591	California	Solano County	0.4	2
95492	California	Sonoma County	0.4	2
95917	California	Butte County	0.4	2
95823	California	Sacramento County	0.4	2
94611	California	Alameda County	0.4	2
89703	Nevada	Carson City	0.4	2
89501	Nevada	Washoe County	0.4	2
96127	California	Lassen County	0.4	2
89523	Nevada	Washoe County	0.4	2
95404	California	Sonoma County	0.4	2
94583	California	Contra Costa County	0.4	2
95005	California	Santa Cruz County	0.4	2
89701	Nevada	Carson City	0.2	1
94561	California	Contra Costa County	0.2	1
96097	California	Siskiyou County	0.2	1
94928	California	Sonoma County	0.2	1
94552	California	Alameda County	0.2	1
95030	California	Santa Clara County	0.2	1
95409	California	Sonoma County	0.2	1
91360	California	Ventura County	0.2	1
95422	California	Lake County	0.2	1
95821	California	Sacramento County	0.2	1

95709	California	El Dorado County	0.2	1
94703	California	Alameda County	0.2	1
95225	California	Calaveras County	0.2	1
95662	California	Sacramento County	0.2	1
94112	California	San Francisco County	0.2	1
94127	California	San Francisco County	0.2	1
95955	California	Colusa County	0.2	1
96146	California	Placer County	0.2	1
94595	California	Contra Costa County	0.2	1
94708	California	Alameda County	0.2	1
95497	California	Sonoma County	0.2	1
95603	California	Placer County	0.2	1
95918	California	Yuba County	0.2	1
94105	California	San Francisco County	0.2	1
94010	California	San Mateo County	0.2	1
89316	Nevada	Eureka County	0.2	1
95818	California	Sacramento County	0.2	1
95630	California	Sacramento County	0.2	1
93924	California	Monterey County	0.2	1
95948	California	Butte County	0.2	1
94941	California	Marin County	0.2	1
94806	California	Contra Costa County	0.2	1
95127	California	Santa Clara County	0.2	1
95972	California	Yuba County	0.2	1
96125	California	Sierra County	0.2	1
88061	New Mexico	Grant County	0.2	1
95207	California	San Joaquin County	0.2	1
95050	California	Santa Clara County	0.2	1
94598	California	Contra Costa County	0.2	1
90274	California	Los Angeles County	0.2	1
94115	California	San Francisco County	0.2	1
94960	California	Marin County	0.2	1
91001	California	Los Angeles County	0.2	1
95663	California	Placer County	0.2	1
95490	California	Mendocino County	0.2	1
95932	California	Colusa County	0.2	1
96128	California	Lassen County	0.2	1
94705	California	Alameda County	0.2	1
96101	California	Modoc County	0.2	1
70115	Louisiana	Orleans Parish	0.2	1
93422	California	San Luis Obispo County	0.2	1
95776	California	Yolo County	0.2	1
96008	California	Shasta County	0.2	1
94707	California	Alameda County	0.2	1
95628	California	Sacramento County	0.2	1
94110	California	San Francisco County	0.2	1
96062	California	Shasta County	0.2	1
96109	California	Lassen County	0.2	1
96117	California	Lassen County	0.2	1
89403	Nevada	Lyon County	0.2	1
94510	California	Solano County	0.2	1

95482	California	Mendocino County	0.2	1
98027	Washington	King County	0.2	1
94509	California	Contra Costa County	0.2	1
96007	California	Shasta County	0.2	1
59718	Montana	Gallatin County	0.2	1
44216	Ohio	Summit County	0.2	1
95822	California	Sacramento County	0.2	1
95963	California	Glenn County	0.2	1
94568	California	Alameda County	0.2	1
98684	Washington	Clark County	0.2	1
98050	Washington	King County	0.2	1
55118	Minnesota	Dakota County	0.2	1
94508	California	Napa County	0.2	1
96041	California	Trinity County	0.2	1
94596	California	Contra Costa County	0.2	1
94559	California	Napa County	0.2	1
94536	California	Alameda County	0.2	1
95988	California	Glenn County	0.2	1
93314	California	Kern County	0.2	1
95831	California	Sacramento County	0.2	1
95829	California	Sacramento County	0.2	1
95401	California	Sonoma County	0.2	1
95670	California	Sacramento County	0.2	1
94044	California	San Mateo County	0.2	1
94134	California	San Francisco County	0.2	1
95819	California	Sacramento County	0.2	1
94618	California	Alameda County	0.2	1
96067	California	Siskiyou County	0.2	1
95336	California	San Joaquin County	0.2	1
95682	California	El Dorado County	0.2	1
96121	California	Lassen County	0.2	1
97632	Oregon	Klamath County	0.2	1
95979	California	Colusa County	0.2	1
Unknown Origin*			0.2	1
94117	California	San Francisco County	0.2	1
94578	California	Alameda County	0.2	1
92037	California	San Diego County	0.2	1
95017	California	Santa Cruz County	0.2	1
95138	California	Santa Clara County	0.2	1
89435	Nevada	Washoe County	0.2	1
89086	Nevada	Clark County	0.2	1
95376	California	San Joaquin County	0.2	1
89439	Nevada	Washoe County	0.2	1
94566	California	Alameda County	0.2	1
95531	California	Del Norte County	0.2	1
95452	California	Sonoma County	0.2	1
95130	California	Santa Clara County	0.2	1
95941	California	Butte County	0.2	1
83422	Idaho	Teton County	0.2	1
94087	California	Santa Clara County	0.2	1
95843	California	Sacramento County	0.2	1

95366	California	San Joaquin County	0.2	1
89460	Nevada	Douglas County	0.2	1
95631	California	Placer County	0.2	1
91320	California	Ventura County	0.2	1
93635	California	Merced County	0.2	1
90266	California	Los Angeles County	0.2	1
94951	California	Sonoma County	0.2	1
89510	Nevada	Washoe County	0.2	1
95903	California	Yuba County	0.2	1
89706	Nevada	Carson City	0.2	1
95691	California	Yolo County	0.2	1
95519	California	Humboldt County	0.2	1
89441	Nevada	Washoe County	0.2	1
94954	California	Sonoma County	0.2	1
94588	California	Alameda County	0.2	1
94122	California	San Francisco County	0.2	1
93247	California	Tulare County	0.2	1
95976	California	Butte County	0.2	1
95946	California	Nevada County	0.2	1
89835	Nevada	Elko County	0.2	1
98025	Washington	King County	0.2	1
89423	Nevada	Douglas County	0.2	1
95712	California	Nevada County	0.2	1
95610	California	Sacramento County	0.2	1
32258	Florida	Duval County	0.2	1
95642	California	Amador County	0.2	1
94520	California	Contra Costa County	0.2	1
92071	California	San Diego County	0.2	1
94531	California	Contra Costa County	0.2	1
95827	California	Sacramento County	0.2	1
89410	Nevada	Douglas County	0.2	1
97405	Oregon	Lane County	0.2	1
95747	California	Placer County	0.2	1
94952	California	Sonoma County	0.2	1
93626	California	Fresno County	0.2	1
02144	Massachusetts	Middlesex County	0.2	1
95961	California	Yuba County	0.2	1
95621	California	Sacramento County	0.2	1
97520	Oregon	Jackson County	0.2	1
96003	California	Shasta County	0.2	1
93940	California	Monterey County	0.2	1
95660	California	Sacramento County	0.2	1
95437	California	Mendocino County	0.2	1
95020	California	Santa Clara County	0.2	1
94030	California	San Mateo County	0.2	1
94945	California	Marin County	0.2	1
94572	California	Contra Costa County	0.2	1
95953	California	Sutter County	0.2	1

* Includes respondents reporting no ZIP code or an invalid ZIP code.

APPENDIX B - Detailed Satisfaction Results

Table B-1. Satisfaction for Visits to Day Use Developed Sites

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness	7.5	12.7	15.4	13.0	51.4	3.9	4.9	38
Developed Facilities	0.9	4.2	9.8	23.6	61.5	4.4	4.6	58
Condition of Environment	0.0	2.7	0.7	13.1	83.4	4.8	4.9	69
Employee Helpfulness	0.0	0.0	0.0	8.6	91.4	4.9	4.5	21
Interpretive Displays	2.6	3.6	10.8	17.9	65.1	4.4	4.3	52
Parking Availability	0.0	3.5	7.0	13.2	76.3	4.6	4.6	68
Parking Lot Condition	2.1	4.2	1.5	21.6	70.5	4.5	4.3	66
Rec. Info. Availability	6.1	7.2	12.7	18.5	55.5	4.1	4.4	45
Road Condition	2.4	1.7	15.3	19.6	61.0	4.4	4.4	60
Feeling of Satefy	0.0	0.0	0.7	13.7	85.6	4.8	4.7	69
Scenery	2.0	0.0	2.0	6.2	89.8	4.8	4.8	69
Signage Adequacy	2.7	13.5	10.9	15.5	57.4	4.1	4.5	69
Trail Condition	0.0	0.0	10.1	17.4	72.5	4.6	4.5	33
Value for Fee Paid	2.4	25.0	2.4	29.3	40.9	3.8	4.8	20

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-2. Satisfaction for Visits to Overnight Developed Sites

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness	0.7	6.7	2.0	24.5	66.1	4.5	4.7	29
Developed Facilities	0.0	0.0	0.9	18.0	81.1	4.8	4.4	24
Condition of Environment	0.0	0.0	0.0	20.2	79.8	4.8	4.7	29
Employee Helpfulness	0.0	0.0	0.0	0.0	100.0	5.0	4.5	13
Interpretive Displays	0.0	8.3	10.1	30.1	51.6	4.2	4.2	22
Parking Availability	7.4	0.0	6.1	16.4	70.1	4.4	4.3	29
Parking Lot Condition	0.0	6.5	3.9	9.7	79.9	4.6	4.2	27
Rec. Info. Availability	1.0	18.1	11.0	29.1	40.8	3.9	4.2	22
Road Condition	2.5	6.6	2.5	26.2	62.3	4.4	4.1	27
Feeling of Satefy	0.0	0.7	0.0	12.2	87.2	4.9	4.7	29
Scenery	0.0	0.0	0.7	6.7	92.6	4.9	4.7	29
Signage Adequacy	0.0	12.2	6.8	21.9	59.2	4.3	4.5	29
Trail Condition	0.0	0.0	1.3	14.4	84.3	4.8	4.3	21
Value for Fee Paid	0.0	6.5	6.5	27.3	59.7	4.4	4.5	21

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-3. Satisfaction for Visits to Undeveloped Areas (GFAs)

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness	11.7	15.3	7.1	0.0	65.8	3.9	4.7	12
Developed Facilities	0.0	0.0	2.5	10.7	86.8	4.8	4.8	17
Condition of Environment	0.0	0.0	0.0	17.9	82.1	4.8	4.8	26
Employee Helpfulness								6
Interpretive Displays	0.0	0.0	36.1	12.0	51.8	4.2	4.1	15
Parking Availability	0.0	0.0	6.4	20.5	73.1	4.7	4.4	24
Parking Lot Condition	0.0	0.0	9.3	11.4	79.3	4.7	4.3	21
Rec. Info. Availability	0.0	12.6	16.5	0.0	70.9	4.3	4.7	10
Road Condition	0.0	2.3	7.7	14.7	75.2	4.6	4.4	22
Feeling of Satefy	0.0	0.0	9.9	8.0	82.1	4.7	4.6	26
Scenery	0.0	0.0	1.9	3.7	94.4	4.9	4.7	26
Signage Adequacy	0.0	6.9	13.9	4.2	75.0	4.5	4.4	20
Trail Condition	0.0	0.0	0.0	23.5	76.5	4.8	4.9	11
Value for Fee Paid	0.0	0.0	11.7	0.0	88.3	4.8	4.8	12

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

Table B-4. Satisfaction for Visits to Designated Wilderness*

Satisfaction Element	Percent Rating Satisfaction as:					Mean Rating§	Mean Importance†	No. Obs‡
	Very Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Very Satisfied			
Restroom Cleanliness							4.7	9
Developed Facilities								6
Condition of Environment	0.0	0.0	7.5	5.3	87.2	4.8	4.8	23
Employee Helpfulness								5
Interpretive Displays	0.0	28.1	17.8	35.6	18.5	3.4	3.9	18
Parking Availability	2.7	0.0	7.5	33.2	56.7	4.4	4.4	23
Parking Lot Condition	0.0	0.0	21.4	33.3	45.3	4.2	3.6	21
Rec. Info. Availability	12.8	0.0	47.7	4.6	34.9	3.5	4.0	11
Road Condition	0.0	12.3	12.3	16.7	58.8	4.2	4.4	12
Feeling of Satefy	0.0	0.0	2.7	18.1	79.1	4.8	4.7	22
Scenery	0.0	0.0	0.0	7.5	92.5	4.9	4.8	23
Signage Adequacy	8.8	21.4	8.8	6.3	54.7	3.8	4.0	21
Trail Condition	0.0	0.0	0.0	14.3	85.7	4.9	4.4	21
Value for Fee Paid								3

NOTE: The data was not reported for items with fewer than 10 responses. Satisfaction and Importance were asked as two separate questions so one of these may have 10 responses even though the other does not.

§ Scale: Very Dissatisfied = 1, Somewhat Dissatisfied = 2, Neither Satisfied nor Dissatisfied = 3, Somewhat Satisfied = 4, Very Satisfied = 5

† Scale: Not Important = 1, Somewhat Important = 2, Moderately Important = 3, Important = 4, Very Important = 5

‡ No. Obs is the number of survey respondents who responded to this item.

* Data supplied is for all Designated Wilderness on the forest combined. Data was not collected for satisfaction for each individual Wilderness on the forest.

FOREST SERVICE HANDBOOK
NATIONAL HEADQUARTERS (WO)
WASHINGTON, DC

1909.12 – LAND MANAGEMENT PLANNING HANDBOOK

CHAPTER 10 – THE ASSESSMENT

Amendment No.: 1909.12-2015-2

Effective Date: January 30, 2015

Duration: This amendment is effective until superseded or removed.

Approved: LESLIE A.C. WELDON
Deputy Chief, NFS

Date Approved: 01/30/2015

Posting Instructions: Amendments are numbered consecutively by Handbook number and calendar year. Post by document; remove the entire document and replace it with this amendment. Retain this transmittal as the first page(s) of this document. The last amendment to this Handbook was 1909.12-2015-1 to 1909.12_zero_code.

New Document	1909.12_10	71 Pages
Superseded Document(s) by Issuance Number and Effective Date	1909.12_10 (Amendment 1909.12-2006-2, 01/31/2006)	27 Pages

Digest:

10 - Changes chapter caption from “Land Management Plan” to “The Assessment.” Revises the chapter in its entirety. Changes captions and sets forth new direction throughout the chapter.

10.5 - Establishes code, caption, and sets forth new terminology in “Definitions.”

10.6 - Establishes code, caption, and sets forth new cited “References.”

14 - Establishes code, caption, and sets forth new direction for “Assessing Designated Areas.”This chapter describes the procedures for writing an assessment to develop, amend, or revise land management plans. See FSH 1909.12, zero code, for a discussion of the adaptive planning framework (assessment, planning, and monitoring) of the Planning Rule.

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10.2 – Objectives

1. Identify and assess a solid base of available information relevant to the plan development or plan revision, by:

   a. Identifying available, relevant information by reviewing a range of sources and information provided by the public and other governmental entities, including potential information sources in 36 CFR 219.6(a);

   b. Assessing available information with the public and other interested parties relevant to the assessment requirements of 36 CFR 219.6(b); and

   c. Developing an understanding of the conditions and trends of the assessment topics that is useful to making decisions about plan components and other content of the plan (36 CFR 219.5(a)(1)).

2. Build an understanding of relevant information with the public and other interested parties before starting plan development or plan revision.

3. Develop relationships with interested parties to facilitate public and government participation among government entities, Indian Tribes, private landowners, and other partners and interested parties.

4. Develop readiness of both the Agency and the public to focus on topics appropriate to a plan or plan revision.

10.4 – Responsibilities

It is the responsibility of the Responsible Official to organize and manage the assessment process as follows:

1. Set the scale, scope, and timing of the assessment early in the process based on what has been learned from monitoring and implementation of projects.

2. Assign an Interdisciplinary Team Leader and Interdisciplinary Team to carry out the assessment process.

3. Identify a systematic, interdisciplinary approach, with the Team and Team Leader to complete the assessment within one year.

4. Identify, throughout the assessment process, the topics to be analyzed in depth.

5. Supervise the process so that the assessment is an analysis and synthesis of the most important relevant information.

6. Engage the public and governmental entities early to encourage participation in the gathering of information for the assessment process (36 CFR 219.4; FSH 1909.12, ch. 40).

7. Manage the assessment process so that the assessment report is promptly available to the public.

8. Ensure the report is written in plain language so that people readily understand it.

9. Ensure the report has concise findings useful to identify the need to change the plan.

10. Ensure that the assessment is within Forest Service authority, the inherent capability of the plan area, and the fiscal capability of the unit.

11. Ensure that the assessment is complete before starting the planning phase.

10.5 – Definitions

See the zero code chapter of this Handbook for definitions.

10.6 – References

1. Cleland, D.T.; Avers, P.E.; McNab, W.H.; Jensen, M.E.; Bailey, R.G., King, T.; Russell, W.E. 1997. National hierarchical framework of ecological units. In, Boyce, M.S.; Haney, A., eds. Ecosystem management applications for sustainable forest and wildlife resources. Yale University Press, New Haven, CT. pp. 181-200.

2. U.S. Department of Agriculture Forest Service. 2011a. Watershed condition classification technical guide. FS-978. Washington, DC: U.S. Department of Agriculture, Forest Service. 49 p. Available at http://www.fs.fed.us/publications/watershed/watershed_classification_guide.pdf

3. U.S. Department of Agriculture, Forest Service. 2011b. Watershed condition framework. FS-977. Washington, DC: U.S. Department of Agriculture, Forest Service. 34 p. Available at http://www.fs.fed.us/publications/watershed/Watershed_Condition_Framework.pdf

4. U.S. Department of Agriculture, Forest Service. 2012. Climate projections FAQ. Gen. Tech. Rep. RMRS-GTR-277WWW. Rocky Mountain Research Station. Fort Collins, CO. 32 p. Available online at http://www.treesearch.fs.fed.us/pubs/40614.

5. Weins, J.A., G.D. Hayward, H.D. Safford, and C.M. Giffen. 2012. Historical environmental variation in conservation and natural resource management. Wiley-Blackwell. Chichester, West Sussex, UK. 337 p.

6. Winthers, E.; Fallon, D.; Haglund, J.; DeMeo, T.; Nowacki, G.; Tart, D.; Ferwerda, M.; Robertson, G.; Gallegos, A.; Rorick, A.; Cleland, D. T.; Robbie, W. 2005. Terrestrial ecological unit inventory technical guide. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office, Ecosystem Management Coordination Staff. 245 p.

11 – ASSESSMENTS

The assessment is defined at 36 CFR 219.5(a)(1).

> **(1) Assessment. Assessments rapidly evaluate existing information about relevant ecological, economic, and social conditions, trends, and sustainability and their relationship to the land management plan within the context of the broader landscape. The responsible official shall consider and evaluate existing and possible future conditions and trends of the plan area, and assess the sustainability of social, economic, and ecological systems within the plan area, in the context of the broader landscape (§ 219.6).** (36 CFR 219.5(a)(1)).

The planning requirement at 36 CFR 219.6(a) describes the process requirements of the assessment for plan development and plan revision.

> **The responsible official has the discretion to determine the scope, scale, and timing of an assessment described in § 219.5(a)(1), subject to the requirements of this section.**
>
> **(a) Process for plan development or revision assessments. An assessment must be completed for the development of a new plan or for a plan revision. The responsible official shall:**
>
> **(1) Identify and consider relevant existing information in governmental or non-governmental assessments, plans, monitoring reports, studies, and other sources of relevant information. Such sources of information may include State forest assessments and strategies, the Resources Planning Act assessment, ecoregional assessments, non-governmental reports, State comprehensive outdoor recreation plans, community wildfire protection plans, public transportation plans, State wildlife data and action plans, and relevant Agency or interagency reports, resource plans or assessments. Relevant private information, including relevant land management plans and local knowledge, will be considered if publicly available or voluntarily provided.**

(2) Coordinate with or provide opportunities for the regional forester, Agency staff from State and Private Forestry and Research and Development, federally recognized Indian Tribes and Alaska Native Corporations, other governmental and non-governmental parties, and the public to provide existing information for the assessment.

The planning requirement at 36 CFR 219.6(b) describes the content of the assessment for plan development and plan revision.

(b) Content of the assessment for plan development or revision. In the assessment for plan development or revision, the responsible official shall identify and evaluate existing information relevant to the plan area for the following:

(1) Terrestrial ecosystems, aquatic ecosystems, and watersheds;

(2) Air, soil, and water resources and quality;

(3) System drivers, including dominant ecological processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change; and the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change;

(4) Baseline assessment of carbon stocks;

(5) Threatened, endangered, proposed and candidate species, and potential species of conservation concern present in the plan area;

(6) Social, cultural, and economic conditions;

(7) Benefits people obtain from the NFS planning area (ecosystem services);

(8) Multiple uses and their contributions to local, regional, and national economies;

(9) Recreation settings, opportunities and access, and scenic character;

(10) Renewable and nonrenewable energy and mineral resources;

(11) Infrastructure, such as recreational facilities and transportation and utility corridors;

(12) Areas of tribal importance;

(13) Cultural and historical resources and uses;

(14) Land status and ownership, use, and access patterns; and

(15) Existing designated areas located in the plan area including wilderness and wild and scenic rivers and potential need and opportunity for additional designated areas. (36 CFR 219.6(b)).

The assessment is the first phase of the three-phase adaptive planning process; the assessment's purpose is to:

1. Before beginning the planning phase, rapidly identify and evaluate existing, available, and relevant information (hereafter referred to as "available information").

a. The term "evaluate" means that the Interdisciplinary Team describes the on-the-ground conditions and estimates the trends, assuming the existing plan remains in place and assuming the influence of a changing climate.

b. The term "trend" means the Interdisciplinary Team describes a general direction in which something is changing or describes the general direction as a range of trend lines.

c. The term "relevant" means the information must have a demonstrable relationship to the required topics and to the land management plan.

(1) If a resource topic is not applicable to the local situation, the Responsible Official should explain why it is not applicable in the assessment.

(2) Review information sources such as the examples listed in 36 CFR 219.6(a)(1), those listed in this Handbook, and those found at the Washington Office planning technical information for planning (TIPS) website for content that is relevant. The TIPS website is found at *http://www.fs.fed.us/TIPS*.

c. The term "available" means that the information is currently and readily accessible by the Forest Service in a form useful for the planning process without further data collection, modification, or validation. If no available information exists for the topic areas described in 36 CFR 219.6(b), there is no requirement to begin new studies to acquire or develop such information.

2. Provide opportunities for the public and governmental entities to participate (FSH 1909.12, ch. 40).

3. Provide information to identify the need to change the plan (FSH 1909.12, ch. 20, sec. 21.21); and

4. Provide information for a plan amendment, if the Responsible Official deems an assessment is necessary to determine the need for an amendment (see FSH 1909.12, ch. 10, sec. 15).

5. The assessment report should identify information needs relevant to assumptions made in addressing the 15 topics. listed in 36 CFR 219.6(b). The Responsible Official may handle such information needs in the planning process through the plan monitoring program or outside the planning process through inventories or research.

The process for evaluating the 15 topics listed in 36 CFR 219.6(b) is often iterative, because as analysis proceeds, or the public or governmental entities provide information, new questions may arise.

Compliance with the Paperwork Reduction Act (PRA) is required for the collection of information of ten or more persons, whether such collection of information is mandatory, voluntary, or required to obtain or retain a benefit. The term information is defined in FSH 1909.12, zero code, section 05. The Responsible Official shall review the PRA (5 CFR 1320) requirements to ensure that methods for obtaining information to meet the requirements of 36 CFR 219.6 and this Handbook are consistent with the Act (see, in particular, 5 CFR 1320.3(h)).

The Responsible Official shall not use any method of obtaining information that is prohibited (absent approval) by the Act. The Office of Management and Budget has approved a generic clearance to collect feedback related to land management planning and the assigned control number is #0596-0234.

11.1 – Spatial Scales for the Assessment

Spatial scales for the assessment may vary by topic for several reasons.

1. Spatial scales to be considered by topic should:

   a. Be sufficiently large to adequately address the interrelationships between conditions in the plan area and the broader landscape, but not so large that these interrelationships lose relevance in guiding land management planning; and

   b. Consider the extent to which social, economic, and ecological attributes of the broader landscape support, or are supported by, conditions in the plan area.

2. Factors that may affect the determination of appropriate spatial scales include:

   a. Characteristics of public access to plan area resources or uses that are of public interest,

   b. Characteristics (composition, structure, function, and connectivity) and geographic scale of the relevant ecosystems,

   c. Economic value of plan area resources and available commercial markets for them,

   d. Fire and other forms or patterns of disturbance,

   e. Landform patterns or landtype associations,

   f. Plant, animal, species, or community distribution and abundance,

   g. Public interest in one or more specific resources or uses,

   h. Social connectivity to National Forest System lands, and

   i. Watersheds.

11.2 – Considerations of Existing Plans, Assessments, and other Sources of Relevant Information

Identify and consider relevant existing information in governmental or non-governmental assessments, plans, monitoring reports, studies, and other sources of relevant information.

Such sources of information may include relevant State forest assessments and strategies, the Resources Planning Act assessment, ecoregional assessments, State, county, or other local plans, tribal plans, and non-governmental reports, State comprehensive outdoor recreation plans, public transportation plans, State wildlife data and action plans, and relevant Agency or interagency reports, resource plans or assessments.

Relevant local, regional, and national wildland fire management plans should be used in development of the assessment and to inform key sections. Such plans may include community wildfire protection plans and the National Cohesive Wildland Fire Management Strategy.

Relevant private information, including relevant land management plans and local knowledge, will be considered if publicly available or voluntarily provided.

11.3 – Assessment Report for Plan Development and Plan Revision

The assessment report must be a concise public document that supports the development of a new plan or plan revision. The Planning Rule requires the report to be public:

> **(3) Document the assessment in a report available to the public. The report should document information needs relevant to the topics of paragraph (b) of this section. Document in the report how the best available scientific information was used to inform the assessment (§ 219.3). Include the report in the planning record (§ 219.14).**
> (36 CFR 219.6).

The assessment report:

1. Is a concise summary of the assessment;

2. Is not a decision document;

3. Describes a clear base of information for identifying a need to change the plan;

4. Integrates the 15 required topics together in the assessment report, as appropriate;

5. Describes the nature, extent, and role of existing conditions and trends within the plan area and in the broader landscape;

6. Summarizes how the best available scientific information and other information informs the assessment (FSH 1909.12, zero code, sec. 07);

7. Identifies information needs as required by 36 CFR 219.6(a)(3);

8. Identifies key assumptions, risks, areas of uncertainty, and how the assessment can inform the development of the monitoring program (for example by suggesting assumptions for testing, as discussed in FSH 1909.12, zero code, section 07;

9. Helps describe the existing conditions in the environmental impact statement;

10. May be brief for some topics of the assessment (for example, utility corridors may only require a map);

11. Is written in plain language and uses appropriate graphics so the public readily understands it; and

12. May include reference maps, tables, charts, or references to other information relevant to the plan area.

13. Summarizes what information was provided by the public during the assessment process and briefly describes how it was used.

11.31 – Public Participation for the Assessment

Public notice that the assessment is beginning is required in the Federal Register, newspaper of record, and online (see FSH 1909.12, ch. 40, sec. 42 for additional detail on notice requirements).

The Planning Rule requires the Responsible Official to provide opportunities for other Agency staff, governmental entities, Indian Tribes and Alaska Native Corporations, and the public to provide existing information for the assessment. Public participation during the assessment also presents an opportunity for people to develop a common understanding of the complex topics across landscapes that are relevant to planning on the unit. Relationships established during the assessment process may contribute to the readiness of both the Agency and the public to focus on priority topics during the planning process.

Refer to 36 CFR 219.4 and FSH 1909.12, chapter 40, section 42.11 for additional direction and guidance on public participation and assessments.

In addition, the Responsible Official should engage the public and governmental entities by:

1. Using traditional and non-traditional sources of information including user-generated content (such as blogging, social media, and wikis).

2. Reaching out to a variety of communities, including low-income and underserved communities, communities with a social, economic, or cultural connection to the plan area, and communities of interest (such as mountain bikers) to obtain their perspective on:

   a. Social, economic, and cultural needs and values; and

   b. Ecological sustainability and plant and animal communities.

11.32 – Tribal Consultation for the Assessment

For information on Tribal consultation see 36 CFR 219.4 and FSH 1909.12, chapter 40, section 44.3.

12 – ASSESSING ECOLOGICAL SUSTAINABILITY AND DIVERSITY OF PLANT AND ANIMAL COMMUNITIES

The Planning Rule contains specific requirements for assessing ecosystem characteristics; air, soil, water; system drivers, carbon stocks; and diversity of plant and animal communities. See

36 CFR 219.6(a) and 36 CFR 219.6(b)(1) through (b)(5). FSH 1909.12, zero code, section 05 defines the terms sustainability and ecological integrity.

Sections 12.1 through 12.55 of this Handbook describe considerations for assessing ecological topics. While these sections cover topics individually, Responsible Officials are encouraged to integrate these topics together in the assessment report.

12.1 – Assessing Terrestrial Ecosystems, Aquatic Ecosystems, and Watersheds

The Interdisciplinary Team shall determine the extent to which terrestrial and aquatic ecosystems relevant to the plan area have integrity (36 CFR 219.6(b)) and document the assessment in the planning record.

It is important to recognize that the conditions of the terrestrial, aquatic, and riparian ecosystems are interconnected with geologic foundation, watershed conditions, water quality, and water resources. Section 12.23 of this Handbook gives additional direction for assessing watershed condition and function.

In addition, knowledge of the extent to which there is ecological integrity both within the plan area and at scales broader than the plan area is important to identify opportunities or limitations for lands in the plan area to contribute to the integrity of the broader ecological systems, as well as the impacts of the broader landscape on the sustainability of resources within the plan area. In some instances, a unique role of the plan area may become apparent at this scale.

The Interdisciplinary Team's approach to assessing for ecological integrity should involve considering available information from a range of sources about terrestrial, aquatic, and riparian ecosystems relevant to the plan area. The required tasks for assessing the status of ecological integrity are as follows (see guidance on each task at the sections indicated:

1. Identify the relevant terrestrial, aquatic, and riparian ecosystems to be assessed (sec. 12.11 of this Handbook).

2. Select key ecosystem characteristics that can be used to predict whether future conditions will have ecological integrity (sec. 12.13 of this Handbook).

3. Identify possible system drivers and stressors (36 CFR 219.6(b)(3)) and assess their influences on key ecosystem characteristics (sec. 12.3 of this Handbook).

4. Describe the natural range of variation for selected key ecosystem characteristics or a suitable alternative to establish a context for whether ecosystems are functioning properly (sec. 12.14a and 12.14b of this Handbook).

5. Assess and document the projected status of the ecosystem based on projected trends of key ecosystem characteristics after considering the current plan and influence of climate change (sec. 12.14c of this Handbook).

12.11 – Identifying the Ecosystems to Assess

The appropriate spatial scale for identifying the ecosystem to assess depends upon the specific issues or concerns being assessed at various stages of the planning process.

The Interdisciplinary Team should use existing Forest Service tools when identifying ecosystems for the assessment. A variety of Forest Service tools are available to support identification of important ecosystems in a plan area, including the Watershed Condition Classification Technical Guide (USDA Forest Service 2011a), Terrestrial Ecological Unit Inventory Technical Guide (Winthers et al. 2005), Aquatic Ecological Unit Inventory, National Hierarchical Framework of Ecological Units (Cleland et al. 1997), and other existing classification and assessment tools (FSM 2060.3). External resources such as Coastal Zone Marine Spatial Planning, Landscape Conservation Cooperatives, or other tools created by other Federal and State agencies, communities, federally recognized Tribes, Alaska Native Corporations, and other entities are also available to identify ecosystems. Finer spatial scales of the National Hierarchical Framework of Ecological Units or other appropriate national or regional assessments (for example, National Fish Habitat Action Plan and Watershed Condition Classification Technical Guide (USDA Forest Service 2011a)) may be appropriate.

Based on the information about ecosystems identified with the appropriate tool, the Interdisciplinary Team should consider the following in identifying ecosystems:

1. Terrestrial, aquatic, groundwater, riparian, and atmospheric aspects of ecosystems that exist and operate at the broader landscape scale;

2. The variety of habitat types (FSH 1909.12, zero code, sec. 05) occurring within the plan area;

3. Presence of rare aquatic and terrestrial plant and animal communities; and

4. The amount, distribution, and connectivity of ecosystems, forests, rangelands, habitat types, and plant and animal communities.

12.12 – Spatial Scales when Assessing for Ecological Integrity

Ecological integrity may be considered at a range of spatial and temporal scales. The Interdisciplinary Team should identify the hierarchical levels for the ecosystems that are relevant to the plan area and:

1. Select the appropriate scale(s) at which to assess for ecological integrity by considering:

   a. The scales of the disturbance processes that impact the plan area;

   b. The geographic ranges and habitats of at-risk species present within the plan area;

   c. The scales at which key ecosystem characteristics are relevant to developing plan components.

2. Assess an area of analysis large enough to capture:

   a. Broad-scale trends; and

   b. Encompass the natural range of variation (or suitable alternative) in disturbance intensity, frequency, and areal extent.

12.13 – Identifying and Selecting Key Ecosystem Characteristics

Key ecosystem characteristics provide a mechanism for assessing status of ecosystem conditions regarding ecological integrity. They are identified, selected, and accessed during the assessment phase, brought forward to help develop plan components, and may be useful when developing monitoring questions and indicators. Key ecosystem characteristics may be added or modified during the planning phase.

1. Key ecosystem characteristics:

   a. Are important specific elements of an ecosystem that sustain the long-term integrity of the ecosystems (sec. 12.14 of this Handbook).

   b. Include dominant ecological characteristics of composition, structure, function, and connectivity of terrestrial, aquatic, and riparian ecosystems, and

   c. May be stressors and possible effects of stressors.

2. Document the key ecosystem characteristics selected for evaluation and the rationale for their selection. Select a manageable set of ecosystem characteristics that, if maintained or restored, sustain the integrity of terrestrial, aquatic, and riparian ecosystems in the plan area (36 CFR 219.8) and appropriately match the scale at which the projected status of the ecosystem integrity is being assessed for the plan decision. See exhibit 01 for examples of key ecosystem characteristics related to composition, structure, function, and connectivity.

12.13 - Exhibit 01

Examples of Potential Key Ecosystem Characteristics for Composition, Structure, Function, and Connectivity[1]

Composition

- Distribution and extent of major vegetation, including shrubland, forestland, rangeland, grassland.
- Presence and abundance of rare and unique habitat types, such as fens, bogs, and talus slopes/scree.
- Species richness, which is the identity and number of individual species native to – or characteristic of – the plan or evaluation area.
- Species diversity, including both richness and evenness.
- Presence and distribution of non-desirable invasive species
- Presence and abundance of species at risk. (sec. 12.5 of this Handbook)
- Presence and distribution of species that have a significant effect on species diversity and ecosystem function (for example, keystone species and ecological engineers).
- Landforms, including those adjacent to stream channels, such as floodplains and inner gorges.
- Types and locations of wetlands, lakes, and ponds.
- Distribution and extent of major soil types and landforms.
- Type, distribution, and interrelationships (contacts, faulting, folding) of geologic formations or rock types and surficial geology.
- Road density.

Structure

- Vertical and horizontal distribution and size of grasses, shrubs, trees, and understory vegetation in selected vegetation types (such as early (pre-forest) and late (mature and old-growth) successional stages).
- Density, size, decomposition class, and distribution of dead wood.
- Fragmentation characteristics such as patch size, edge length, percent forest interior, amount and distribution of vegetation seral/structural stages, proportion of forest interior, and connectivity (such as, the five seral stages defined in the Fire Regime Condition Class process).
- Landscape patch adjacency and context, connectivity, and compatibility of nearby land uses.
- Rangeland conditions and trends.
- Stream habitat complexity.
- Stream connectivity for fish passage and transport of nutrients and bedding substrates for aquatic species
- Riparian, wetland, and groundwater- dependent habitat structure.
- Locations of tributaries and tributary junctions.
- Lake morphometry including depth, width, and shoreline development.
- Soil texture, bulk density, and microtopography as they influence soil available water or other soil functions.
- Missing or diseased vegetation due to tropospheric ozone impacts.
- Distribution of stream diversions and impoundments.
- Extent of stream dewatering and channel alteration.
- Watershed morphometry and hydrology attributes, such as elevation, aspect, drainage patterns, patterns of groundwater recharge and discharge, distribution of perennial, intermittent, and ephemeral channels.

12.13 - Exhibit 01—Continued[1]

Structure (Continued)

- Quality, quantity, timing, and distribution of water resources across watersheds and aquifers.
- Air quality as measured in concentration and deposition of pollutants over an area.
- Landslides, fault-influenced streams, and geologic characteristic that influence groundwater dependent ecosystems.

Function (Ecological Processes)

- Types, frequencies, severities, patch sizes, extent, and spatial pattern of disturbances such as fires, grazing, timber harvest, landslides, floods, and insect or disease outbreaks.
- Ability of native species to move throughout the plan area, and cross into adjacent areas, to use habitat that fulfills their life cycle needs (for example, breeding, foraging, migration, and sheltering).
- Successional pathways and stand development of major vegetation types, longevity, and turnover of habitats.
- Pollination.
- Predation at multiple trophic levels.
- Fire regime condition class, as a measure of departure from the reference conditions in vegetation types and fire frequency and severity.
- Stream and lake temperature and nutrient regimes.
- Hydrologic flow regimes including time, duration, magnitude.
- Sediment transport including timing and duration.
- Biogeochemical cycling, including nitrate and phosphate concentrations, methylmercury, and acid neutralizing capacity.
- Rate of invasion by invasive species.
- Soil productivity.
- Energy flow.

Connectivity

- Proximity and size characteristics such as patch size, edge length, percent forest interior, amount and distribution of vegetation seral/structural stages, proportion of forest interior, (such as, the five seral stages defined in the Fire Regime Condition Class process).
- Landscape patch adjacency, distribution, and context, connectivity, and compatibility of nearby land uses.
- Distribution of streams and size of stream network with unimpeded aquatic organism passage.
- Stream length with adequate flow for beneficial uses.
- Watershed morphometry and hydrology attributes, such as such as drainage patterns, location of groundwater discharge, and distribution of stream channels.
- Available habitat to enable native species to move throughout the plan area, and cross into adjacent areas, to use habitat that fulfills their life cycle needs (for example, breeding, foraging, sheltering).
- Hydrologic flow regimes including time, duration, magnitude.
- Ability of streams to transport nutrients and bedding substrates for aquatic species.
- Stressors that reduce or truncate connectivity.

[1] Including those not observed directly but inferred from appropriate indicators.

3. Selected key ecosystem characteristics should be limited to those characteristics where:

a. The information regarding the characteristic is available.

b. The characteristic is measurable or can be mapped, and may be analyzed at the scale appropriate to the plan decision or can be ranked and assessed by experts.

c. The characteristic responds to direct or indirect management or will inform management by the Forest Service.

4. One or more of the following criteria should guide the selection of key ecosystem characteristics:

a. The conditions and trends of the characteristic are important to sustaining integrity and meaningful in developing plan components. For example, the characteristic is important:

(1) To the functions and ecological processes that create or maintain ecosystems and their associated services;

(2) To indicate representativeness (FSH 1909.12, zero code, sec. 05);

(3) To understanding the possible effects of stressors (sec. 12.32 of this Handbook);

(4) To indicate redundancy (FSH 1909.12, zero code, sec. 05); or

(5) For using biological or ecological indices.

b. The characteristic includes ecological conditions needed for threatened, endangered, proposed, candidate, or species of conservation concern (sec. 12.5 of this Handbook).

c. The characteristic is useful for serving multiple purposes of the assessment.

d. The characteristic is useful for monitoring trends, such as monitoring of the status of focal species (FSH 1909.12, ch. 30, sec. 32.13c).

12.14 – Assessing Ecosystems for Ecosystem Integrity

The purpose of assessing for ecosystem integrity is to determine whether ecosystems are functioning normally and are uncompromised. Ecosystems have integrity when their composition, structure, function, and connectivity are operating normally over multiple spatial and temporal scales. There are two steps to assess whether an ecosystem has integrity:

1. Use the natural range of variation or alternative approach to determine conditions that sustain the integrity of the selected key ecosystem characteristics. The conditions that sustain integrity are also referred to as the ecological reference model (sec. 12.14a and 12.14b of this Handbook).

2. Assess and document the current condition and status of ecosystems using key ecosystem characteristics and then project their future conditions and trends (sec. 12.14c of this Handbook).

12.14a – Describing the Natural Range of Variation

When assessing whether an ecosystem has integrity, the Interdisciplinary Team should use the natural range of variation as the ecological reference model, unless the past information regarding the selected key ecosystem characteristic is lacking, or the system is no longer capable of sustaining key ecosystem characteristics identified as common in the past based upon likely future environmental conditions.

The natural range of variation (NRV) is part of the definition of ecological integrity (FSH 1909.12, zero code, sec. 05). A description of the natural range of variation provides insight into the temporal dynamics and key characteristics of an ecological system and provides a context for assessing whether an ecosystem has integrity. For instance, the natural range of variation can be compared to existing conditions and recent disturbance processes, allowing the Interdisciplinary Team to identify important compositional, structural, and functional ecosystem elements for developing plan components (FSH 1909.12, ch. 20, sec. 23.11a).

The natural range of variation does not represent a management target or desired condition. A description of the natural range of variation alone is not sufficient to determine whether there is ecological integrity.

The Interdisciplinary Team may use alternatives to the natural range of variation approach for assessing integrity as described in section 12.14b, when past information for key ecosystem characteristics is missing or the system is no longer capable of sustaining key ecosystem characteristics identified as common in the past.

The Interdisciplinary Team should describe the natural range of variation based on review and synthesis of available information for selected key ecosystem characteristics of terrestrial, aquatic, and riparian ecosystems. Information used to determine the natural range of variation may be drawn from many sources including scientific journal articles, historical records and photographs, early surveys, pollen and sediment records, tree ring analyses, or descriptions of reference areas. The Interdisciplinary Team may adapt the natural range of variation analysis from another National Forest System unit for specific ecosystems that are shared and make adjustments to fit the local conditions. Refer to Wiens et al. 2012 for further discussion and examples.

The natural range of variation should be described as a range of conditions and dominant processes occurring over the period selected for analysis. Some conditions may have occurred frequently, and others may have occurred rarely. When describing the natural range of variation, the Interdisciplinary Team may consider the following approach:

1. Determine the temporal scale for the natural range of variation description. Refer to Wiens et al. 2012 for discussion of ecological insights that can be developed by examining historical ecology at different temporal scales.

2. Describe the natural range of variation of disturbance regimes within the selected period. Describe how dominant disturbance regimes (defined in FSH 1909.12, zero code, sec. 05) influence key ecosystem characteristics that operate at the selected spatial scales and the disturbance regimes variability. Descriptions of disturbance regimes may include:

a. Type of disturbance (such as insects and diseases, geologic hazards, weather, flooding, and fires),

b. Frequency and range in time intervals between disturbances,

c. Severity, including the range of the area or patch sizes impacted and intensity of the disturbance,

d. Landscape pattern (including patch size distribution, connectivity, and association with the physical environment), and how patterns change over time due to variations in disturbance frequency and severity, and

e. The manner in which the disturbance regime influence the structure, composition, and successional states of terrestrial vegetation and aquatic and riparian systems

12.14b – Alternative to the Natural Range of Variation Approach

In some situations, there is not enough information to understand the natural range of variation under past disturbance regimes for selected key ecosystem characteristics or the system is no longer capable of sustaining key ecosystem characteristics identified as common in the past based upon likely future environmental conditions. In these cases, the Interdisciplinary Team should establish an alternative ecological reference model for context for assessing for integrity by identifying the conditions that would sustain these key ecosystem characteristics. In this case, the ecological reference model may include the following factors:

1. Representativeness (defined in FSH 1909.12, zero code, sec. 05).

2. Effects of stressors on the integrity of ecosystems in terms of composition, structure, function, and connectivity.

3. Redundancy (defined in FSH 1909.12, zero code, sec. 05).

4. Habitat associations of particular species or species groups with different home ranges, migration patterns, and/or habitat affinities.

5. Existing biotic integrity, using biological or ecological indices.

Several of these factors may be used in combination with each other.

12.14c – Assess the Status of the Ecosystems and their Trend.

Section 12.14a and 12.14b of this Handbook gives guidance for determining the ecological reference model (natural range of variation or suitable alternative) used to compare key ecosystem characteristics against when determining the status of ecosystem integrity. The Interdisciplinary Team should assess the status of each key ecosystem characteristics concerning ecosystem integrity. Then, the Interdisciplinary Team should assess whether projections of future conditions indicate ecological integrity. When assessing existing conditions of key ecosystem characteristics, and identifying trends, the Interdisciplinary Team should assume existing plan direction remains in place and the influence of climate change and other large-scale threats and stressors continues. The following list describes the process.

1. Using the ecological reference model as the normal for ecological integrity the Interdisciplinary team should consider:

a. Whether the key ecosystem characteristics and associated physical, chemical, and biological processes are functioning and would likely continue to function in a way that contributes to long-term integrity of ecosystems and provide conditions for species adaption to a changing climate;

b. Whether the key ecosystem characteristics and associated processes have been altered, eliminated, or are declining or increasing in extent and/or quality, or have declined or increased in the past, including changes in the spatial pattern;

c. Whether there are existing and reasonably foreseeable barriers to ecological connectivity for terrestrial and aquatic organisms;

d. If the key ecosystem characteristics or ecological functions (processes)are rare in the plan area or otherwise clearly vulnerable to future environmental change;

e. If projects or activities would be necessary to maintain or restore key ecosystem characteristics or ecological functions (processes);

f. How the existing role or contributions of the plan area affects the key ecosystem characteristics or ecological functions (processes) relevant to the broader landscape;

g. The influences on key ecosystem characteristics or processes that are from existing conditions, threats, or stressors, which can be within or beyond the plan area; and

h. The possible trend of those key ecosystem characteristics or processes.

2. To determine the existing condition of riparian and aquatic ecosystems, the Interdisciplinary Team may consider:

a. Describing the ecological connectivity, using the spatial distribution and barrier effects of obstructions to aquatic organisms and other biotic (transport or dispersal processes) and abiotic (sediment, nutrients, water, and material) passage;

b. Describing the stressors such as changes in flow regime and dewatering, channelization, invasive species, changes in sediment delivery to channels, herbivory, wildfire, and fuel buildup, changes in water quality due to pollutants, and sediment buildup; and

c. Comparing overall riparian condition to the natural range of variation or some other ecological reference model. Stream, wetland, and waterbody classifications may be useful in identifying "like systems" for comparison with those of interest.

3. The assessment of the status of ecosystem integrity should do the following:

a. Compare the existing conditions of each key ecosystem characteristic with the natural range of variation information. When natural range of variation information is lacking or the system is no longer capable of sustaining key ecosystem characteristics identified as common in the past based upon likely future environmental conditions, use an alternative ecological reference model to assess whether the existing condition of each characteristic would sustain ecosystem integrity.

b. Describe the projected future status of each key ecosystem characteristic assuming:

(1) Existing plan direction remains in place, and

(2) The influence of climate change and other large-scale threats and stressors will continue, based on best available scientific information regarding trends (sec. 12.3 of this Handbook).

c. Describe the proportional occurrence of each key ecosystem characteristic both beyond and within the plan area by:

(1) Comparing the occurrence of the characteristic in the plan area to the occurrence at the broader ecological scales to place the occurrence within the plan area in a larger landscape context;

(2) Identifying patterns in the occurrence of the key ecosystem characteristic in the plan area and identify deviations from its fully functional form in the ecosystem; and

(3) Identifying which key ecosystem characteristic(s) are abundant or rare in the plan area and at the broader ecological scales.

d. Determine whether existing ecological conditions sustain ecological integrity (or sustain fully functional ecosystems), and if not, the extent to which existing conditions vary from conditions that would do so, and what the projected future ecosystem conditions would be. See FSH 1909.12, chapter 20, section 23.11 for a discussion of functional ecosystems. Indicate if one of the following is true for each key ecosystem characteristics:

(1) The key ecosystem characteristic is functioning in a way that contributes to long-term integrity of ecosystems and species adaption to a changing climate and is expected to continue to do so under existing plan direction;

(2) The key ecosystem characteristic is not currently contributing to ecological integrity, but with changes in management or plan direction, could do so in the future; or

(3) The key ecosystem characteristic is not expected to contribute to ecological integrity in the future due to threats or stressors that cannot be changed because they are outside Forest Service authority, the inherent capability of the plan area, or the fiscal capability of the unit.

12.14d – Assessing Riparian Areas and Groundwater-dependent Ecosystems

The assessment should describe the status of riparian areas (ecosystems) using the guidance of section 12.14d, paragraphs 1, 2, and 3 of this Handbook in relation to the ecological reference model, assuming existing plan direction remains in place. When there is available information, the Interdisciplinary Team should identify and assess riparian areas and groundwater-dependent ecosystems in the plan area for the assessment. Groundwater-dependent ecosystems include springs, perennial streams, fens, caves, and many riparian areas and wetlands. This identification must be relevant to the development of plan components under 36 CFR 219.8(a)(3). To identify riparian areas and groundwater-dependent ecosystems consider one or more of the following methods:

1. Identify the location and extent of surface waterbodies, vegetation, geology, soils, geomorphology, and topography.

2. Identify vegetation indicators of riparian areas and groundwater-dependent ecosystems that include distinctive riparian or groundwater-dependent vegetation or the potential to support distinctive vegetation.

3. Identify fluvial geomorphic indicator criteria for riparian areas that may include break in slope, evidence of fluvial deposition, high water marks, lack of upland soil formation, and lichen growth on rocks.

4. Identify 100-year recurrence interval flood stage where available and relevant to identification of groundwater-dependent ecosystems for the development of plan components.

5. Identify any existing site-specific riparian area or groundwater dependent ecosystem delineations, buffers, or riparian management areas and existing plan direction related to them.

12.2 – Assessing Air, Soil, and Water Resources

The Interdisciplinary Team shall assess available information about air, soil, geologic, and water resources that is useful to developing plan components and other plan content. For additional information see 36 CFR 219.6(b) and section 11 of this Handbook.

12.21 – Assessing Air Quality

The assessment should describe the existing conditions and trends of airshed conditions and air quality. FSM 2580 - Air Resource Management gives direction about air management. Information is available online at *http://www.fs.fed.us/air/index.htm*. The terms discussed in this section, "airshed" and "critical loads," are defined in FSH 1909.12, zero code, section 05. Also, Regional air staff may have developed geographically refined critical load information appropriate for the plan area that should be considered.

The Interdisciplinary Team should use available information from governmental agencies, regional planning organizations, and Washington Office Air staff website at *http://www.fs.fed.us/air/portal.htm*. In addition, the Interdisciplinary Team should do the following at the airshed scale:

1. Identify the airsheds relevant to the plan area.

2. Identify within the relevant airsheds the location and extent of known sensitive air quality areas, such as class I areas, nonattainment areas, and air quality maintenance areas.

3. Identify emission inventories, conditions, and trends within the relevant airsheds.

4. Identify the relevant Federal, State, and Tribal agency implementation plans for regional haze, nonattainment, or maintenance areas and determine whether Forest Service emission estimates have been included in the appropriate agency implementation plans.

5. Identify critical load exceedances for the plan area. If critical load exceedances occur on the plan area, assess the extent and severity of these exceedances.

6. Using the information gathered from items 1 through 5, document the conditions and trends of relevant airsheds assuming existing plan direction remains in place.

12.22 – Assessing Soil

The Interdisciplinary Team should identify and assess available information on soils, geology, landforms (geomorphology), and other such ecological conditions important to support key ecosystem characteristics.

1. The Interdisciplinary Team may consider the following information when assessing soils and soil productivity:

a. Existing interpretations of soil surveys certified by the National Cooperative Soil Survey.

b. Existing information on vegetation suitability and productivity, and natural range of variation, in addition to the standard soil interpretations from a terrestrial ecological unit inventory).

c. Existing approximations of soil-landform units and attribute data derived from remotely sensed data or from expert opinion (FSH 1909.12, ch. 10, sec. 13.22).

d. Ecological site descriptions of the plan area developed in cooperation with USDA Natural Resources Conservation Service (*https://esis.sc.egov.usda.gov/About.aspx*).

2. When identifying and assessing the available information, the Interdisciplinary Team should:

a. Identify existing inventories of soil conditions and improvement needs;

b. Identify important attributes, characteristics, or processes of soils including soil erosion and sedimentation that make them susceptible to loss of integrity resulting from specific uses, disturbances, or environmental change; and

c. Using the information gathered from items a and b, describe in the assessment the existing conditions and trends of soil resources and soil quality assuming existing plan direction remains in place.

12.23 – Assessing Watersheds and Water Resources

The Interdisciplinary Team should identify and assess available information for watersheds and water resources (surface and groundwater) and their role in sustaining the structure and function of terrestrial, riparian, and aquatic ecosystems within the plan area and beyond the plan area where relevant to the plan. The assessment should describe the existing conditions and trends of watersheds and water resources in the plan area.

In addition, the Team should assess information about the influence of the larger area of analysis on the status of watersheds and water resources within the plan area and the influence of the plan area on the larger area of analysis.

Watersheds relevant to the plan should include those lands outside the National Forest System that contribute surface or subsurface water flows to the plan area, and those that receive surface or subsurface water flows from the plan area. Groundwater-dependent ecosystems should also be considered (*http://www.fs.fed.us/geology/groundwater.html*).

When there is available information that is useful to develop plan components and other plan content, the Interdisciplinary Team should consider the following at the appropriate watershed scale:

1. Information about watersheds and water resources, including information generated through the Watershed Condition Classification Technical Guide (USDA Forest Service 2011a), step A of the Watershed Condition Framework (USDA Forest Service 2011b), and information associated with designated Watershed Condition Framework priority watersheds. Other information to consider includes:

    a. Condition of watersheds relevant to the plan.

    b. Presence of impaired or contaminated surface and ground waters within or adjacent to the plan area and the larger area of analysis.

    c. Quantity, quality, timing, and distribution of water across the plan area and the area of analysis, including for groundwater resources and groundwater-dependent ecosystems.

    d. Flow regimes needed to sustain ecosystems.

    e. Available information for relevant species at risk (sec. 12.5 of this Handbook).

    f. Existing documented refugia for aquatic species.

2. The historical context (such as the natural range of variation) for ecological conditions under which the hydrologic systems developed;

3. The nature, extent, and role of existing and reasonably foreseeable future consumptive uses and non-consumptive uses (such as recreation, habitat conservation, restoration), including water withdrawals, diversions, storage, and the associated infrastructure (sec. 13.34 of this Handbook). The Interdisciplinary Team should pay particular attention to the influence on aquatic species at risk and human population centers in proximity to the area of analysis;

4. The nature and distribution of Federal and non-Federal water rights across the plan area;

5. Essential fish habitat of managed fisheries identified by National Marine Fisheries Service (NMFS);

6. Spawning, rearing, and other necessary habitat for native fish assemblages identified by U.S. Fish and Wildlife Service, State, or Tribal fish and wildlife agencies;

7. The reasonably anticipated future patterns of perturbation (such as, altered precipitation, changing climate, drought, evapotranspiration patterns, flood, and temperature changes);

8. The municipal watersheds, sole source aquifers, and source water protection areas within the plan area and the area of analysis (sec. 13.34 of this Handbook);

9. The effects of land use, projects, and activities, and reasonably foreseeable future water withdrawals and diversions, and water storage facilities (surface and subsurface)on hydrologic and geomorphic processes and water resources (sec. 13.34 of this Handbook);

10. The ecological, social, and economic roles (both process and services) that water resources play in the context of the broader landscape (sec. 13.34 of this Handbook); and

11. Based on the above information, the assessment should describe the existing conditions and trends of watersheds and water resources assuming existing plan direction remains in place.

12.3 – Assessing System Drivers, Stressors, including Risks related to Climate Change

The planning regulation at 36 CFR 219.6(b) requires that the Responsible Official identify and evaluate available information relevant to the plan area for system drivers of key ecosystem characteristics of terrestrial, aquatic, and riparian ecosystems and watersheds including the influence of a changing climate:

> **(3) System drivers, including dominant ecological processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change; and the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change. . .** (36 CFR 219.6(b)(3))

The assessment should answer the following questions—what are system drivers and stressors that influence the plan area, and what is known about the opportunities to reduce risk and adapt to system drivers, stressors and the influence of climate change?

12.31 – Consideration of System Drivers

When identifying and evaluating system drivers, consider:

1. Natural disturbance regimes. The Interdisciplinary Team should:

   a. Describe the natural disturbance regimes such as wildfire and wind during the reference period used for determining the natural range of variation (sec. 12.14 of thie Handbook);

   b. Compare these natural disturbance regimes to the type and frequency of current natural disturbances; and

   c. Describe whether disturbance regimes have changed since the reference period to a degree that impairs the function of key ecosystem characteristics or other ecological conditions needed to support the terrestrial, aquatic, and riparian ecosystems relevant to the plan area.

2. Predominant climatic regimes. The Interdisciplinary Team should assess predominant climatic regimes by reviewing existing information such as vulnerability assessments and scenario planning. The Interdisciplinary Team should coordinate with the Research and Development staff on available climate change information. General technical report "Climate projections FAQ" may be helpful in understanding predominant climate regimes. The report is available online at the Treesearch website at *http://www.treesearch.fs.fed.us/pubs/40614*. Note that climate change is both a system driver and a stressor. The Interdisciplinary Team shall document the assumptions used to assess predominant climate regimes.

3. Broad-scale system drivers or disturbance regimes. The Interdisciplinary Team should:

   a. Describe broad-scale disturbance regimes, such as wide ranging flooding, geologic hazards, insects, and disease, wildfire, and wind where applicable; and

b. Identify uncharacteristic conditions that influence system drivers, such as where fire exclusion by human action causes conditions that offer few opportunities for regenerating early seral stages.

4. Natural vegetation succession. The Interdisciplinary Team should:

a. Describe the influence of age or size-class condition on key ecosystem characteristics;

b. Identify human-caused changes in successional pathways that may maintain vegetation in an uncharacteristic age or size-class condition; and

c. Consider scarcity and abundance of successional states relative to the reference period used for determining the natural range of variation (sec. 12.14 of this Handbook).

12.32 – Consideration of Stressors

FSH 1909.12, zero code, section 05, defines "stressors." Examples of stressors include invasive species impacts, loss of spatial connectivity, disruption of natural disturbance regimes, and influence of climate change. The Responsible Official shall identify and assess available information for stressors that directly or indirectly degrade or impair key ecosystem characteristics and ecological sustainability.

1. When identifying and assessing information and trends of stressors the Interdisciplinary Team may consider the following:

a. Ability of ecosystems within the plan area to adapt to changes imposed by stressors while retaining their composition, structure, and function;

b. Duration and return interval of stressors;

c. Environmental consequences of stressors, including whether the changes in conditions of key ecosystem characteristics caused by stressors are close to causing abrupt fundamental changes in the ecosystem;

d. Geographic extent of the stressor and the geographic effects of the stressor;

e. Influence of changing climate, such as alterations of precipitation patterns or changes in the number of frost-free days, and other large-scale stressors on the key ecosystem characteristics, and their resulting vulnerability to likely future conditions;

f. Reversibility (if management action is taken to mitigate effects (manageability));

g. Severity and trends in severity according to their impact on key ecosystem characteristics;

h. Stressors associated with irreversible conditions, beyond which ecosystems reorganize and transition to an alternate state;

i. Stressors not controllable through management of the plan area that may affect conditions within the plan area, changing land-use patterns adjacent to National Forest System units, water storage facilities, or hydropower facilities upstream or downstream from National Forest System units;

j. Stressors and threats to riparian conditions, such as changes in flow regime, hydrograph timing, water withdrawals and dewatering, channelization, invasive species, changes in sediment delivery to channel, herbivory, water temperature or chemistry (such as heavy metals), wildfire, and fuels;

k. Stressors associated with the impacts of human uses, including energy (renewable and nonrenewable), infrastructure, minerals, outdoor recreation, range, timber, watershed, wildland fire, wildland-urban interface, wildlife, fish, and reduction in occurrences of prescribed fire in fire-dependent ecosystems due to proximity of human habitation, and ;

l. Stressors that are a result of other stressors, overlapping stressors, or accumulating stressors. For example, the presence of forage disease is a result of herbivore concentration due to drought-induced loss of habitat. Stress-related disease directly affects available forage species and indirectly affects occurrence of fire (disturbance), resulting in an invasive species (stressor) outcompeting and further diminishing the forage species; and

m. Stressors that are a result of successive additions of stressors.

2. The Interdisciplinary Team should use existing climate change information such as vulnerability assessments and scenario planning during the evaluation of stressors and should identify information gaps, uncertainties, and assumptions when evaluating existing and future stressors. Note that climate change is both a system driver and a stressor. In addition, the Responsible Official may consider the following resources:

a. Forest Service guidance on climate change available online at *http://www.fs.fed.us/climatechange/*.

b. Forest Service climate change resource center website at *http://www.fs.fed.us/ccrc/*.

c. USDA, Forest Service, 2012, Future of America's Forest and Rangelands: Forest Service 2010 Resources Planning Act Assessment, Gen. Tech. Rep. WO-87. Washington, DC. 198 p. Available online at *http://www.treesearch.fs.fed.us/pubs/41976/.*

d. US Global Change Research Program (USGCRP) Assessment at *http://scenarios.globalchange.gov/scenarios/climate*.

e. National Climate Assessment – Forest Sector Technical Report—Vose, James M.; Peterson, David L.; Patel-Weynand, Toral, eds. 2012. Effects of climatic variability and change on forest ecosystems: a comprehensive science synthesis for the U.S. forest sector. Gen. Tech. Rep. PNW-GTR-870. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 265 p. Available online at *http://www.fs.fed.us/research/climate-change/assessment/.*

f. Daniels, A.E. et al 2012, Climate Projections FAQ, Gen. Tech. Rep. RMRS-GTR-277WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 32 p. Available online at *http://www.treesearch.fs.fed.us/pubs/40614.*

12.4 – Assessing Carbon Stocks

Carbon sequestration and storage is an ecosystem service provided by forests and rangelands. The Responsible Official shall identify and assess available information relevant to the plan area for baseline assessment of carbon stocks (36 CFR 219.6(b)(4)). A baseline assessment estimates existing carbon stocks and recent changes in carbon stocks on the land and in harvested wood products. If an assessment of carbon stocks in the plan area is already available, the Interdisciplinary Team may use such an assessment. Tools for analyzing carbon may be found at the Northern Research Station's Carbon website at *http://www.nrs.fs.fed.us/carbon/tools/*. Additional information about carbon sequestration is available at the Forest Service's Carbon Sequestration website at *http://www.fs.fed.us/ecosystemservices/carbon.shtml*.

1. The assessment of carbon stocks is developed to understand how:

   a. The plan area plays a role in sequestering and storing carbon;

   b. Disturbances, projects, and activities influenced carbon stocks in the past and may affect them in the future; and

   c. Where the carbon is stored, how the storage is changing, and how the storage might be influenced by management.

2. The Interdisciplinary Team may consider:

   a. Whether existing conditions and trends of vegetation (aboveground carbon pool) indicate that the plan area is a carbon sink or carbon source; and

   b. The future trend of the plan area in sequestering and storing carbon under existing plan guidance.

12.41 – Identifying Carbon Pools

The Interdisciplinary Team should identify the carbon pool from where the plan area's carbon stocks are assessed.

The Interdisciplinary Team may use previously identified carbon stocks for the plan area, a multi-plan area, State, or Regional basis, or other appropriate ecological scale so long as the results can be separated by plan area.

The Interdisciplinary Team may consider developing separate estimates of carbon pools for forest and nonforest (for example, grassland, and shrubland) ecosystems. The following sources of information at the plan area or other scale that overlaps the plan area may be useful for estimating carbon pools:

1. Allometric equations or models (for example, Forest Vegetation Simulator or Northeast Decision Model).

2. Forest and range vegetation maps and stand exam data.

3. Forest Inventory and Analysis (FIA) data, publications, and reports.

4. Fuel management reports.

5. Landscape Fire and Resource Management Planning Tools (LANDFIRE) vegetation maps.

6. Scientific literature applicable to the plan area.

7. Soil surveys conducted by the USDA Natural Resources Conservation Service for soil carbon.

8. Timber cut and sold reports for the harvested wood products pool.

9. Wildlife habitat information for dead and down trees carbon pools.

12.42 – Assessing the Plan Area Influences on Carbon Stocks

The Interdisciplinary Team should identify influences on carbon stocks. Influences on the carbon or carbon-bearing compounds of the carbon pool may include disease, insects, growth, management, timber harvest, vegetation, and wildfire. Consider using information assessed according to section 12.3 of this Handbook, regarding system drivers and stressors. If information is available, the assessment may include the potential change over time (flux) of carbon stocks within those pools. Examples of potential information sources include:

1. Wildfire history maps and other information (for example, trends in burn severity).

2. Forest health information (for example, aerial detection maps of recent insect and disease mortality).

3. Timber harvest cut and sold report.

4. Other vegetation treatment data and reports.

12.5 – Identifying and Assessing At-risk Species

The Interdisciplinary Team shall identify and assess available information relevant to the plan area for threatened, endangered, proposed, and candidate species and potential species of conservation concern present in the plan area (36 CFR 219.6(b)).

Based on the information, the Interdisciplinary Team shall identify and document the set of at-risk species and assess plan area ecological conditions for these species in the assessment. The set of at-risk species for assessment purposes are:

1. Federally recognized threatened, endangered, proposed, and candidate species (sec. 12.51 of this Handbook).

2. Potential species of conservation concern (sec. 12.52 of this Handbook).

12.51 – Identifying Federally Recognized Species

As a part of the assessment and planning process, the Responsible Official shall coordinate with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration NMFS, as appropriate, to identify federally listed threatened and endangered species, species proposed for Federal listing, and candidate species in the plan area.

12.52 – Identifying Species of Conservation Concern

The Planning Rule defines species of conservation concern as follows:

> **(c) Species of conservation concern. A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area.** (36 CFR 219.9).

The rule requires the Responsible Official to identify potential species of conservation concern and assess existing information for them in the assessment (36 CFR 219.6 (b)(5)). Direction about potential species of conservation concern and species of conservation concern is found in two chapters of this Handbook as follows:

1. Responsibilities of Responsible Official for potential species of conservation concern during the assessment are found in section 12.52a of this Handbook.

2. Requirements for developing the list of potential species of conservation concern are found in section 12.52b of this Handbook.

3. Criteria for identifying a species of conservation concern are found in section 12.52c of this Handbook.

4. Species to consider when identifying potential species of conservation concern are found in section 12.52d of this Handbook.

5. Guidance regarding the Regional Forester's identification of the species of conservation concern is found in FSH 1909.13, chapter 20, section 21.22a.

6. Guidance on evaluating new information on species of conservation concern is found in FSH 1909.12, section 21.22b.

12.52a – Responsibilities for Species of Conservation Concern During the Assessment

The Responsible Official has the authority and responsibility to:

1. Identify potential species of conservation concern (36 CFR 219.9(c)).

2. Identify and assess information relevant to species that occur in the plan area and when the best available scientific information raises a substantial concern about a

species' capability to persist over the long term in the plan area. This information serves as a filter during the assessment process to aid in the efficiency and efficacy of the process used to identify potential species of conservation concern.

3. Leverage expertise of the public, including local, State, Tribal, and other Federal natural resource agencies, for identifying species of conservation concern.

4. Engage the public and consider public input on the assessment including the identified potential species of conservation concern (see FSH 1909.12, ch. 40, sec. 42 for guidance on public participation).

FSH 1909.12, chapter 20, section 21.22a describes the responsibilities of the Regional Forester for species of conservation concern.

12.52b – Developing the List of Potential Species of Conservation Concern

Unless the Regional Forester has identified the species of conservation concern before the assessment process, during the assessment phase the Responsible Official shall:

1. Coordinate with the Regional Forester when identifying the potential species of conservation concern. This coordination may be conducted in several ways including:

a. The Regional Forester and Responsible Official may jointly identify the potential species of conservation concern for the plan area.

b. The Responsible Official may provide an initial list of potential species of conservation concern for review by the Regional Forester, who may concur or request modifications.

c. The Responsible Official and Regional Forester may review and adjust a previously developed list of potential species of conservation concern derived from plan area or multi-plan area studies or broad-scale assessments.

d. The Regional Forester may develop an initial list of potential species of conservation concern for each plan area within the Region and the Responsible Official may analyze the species on this list and any additional species, as appropriate.

2. Use the criteria in section 12.52d of this Handbook to select the species to consider, and the criteria in section 12.52c of this Handbook to identify the potential species of conservation concern.

3. Document the best available scientific information supporting the identification of a species as a potential species of conservation concern.

4. Document the best available scientific information that supports not identifying a species that was considered but not identified as a potential species of conservation concern. Such rationale may include:

a. Knowledge of the species abundance, distribution, lack of threats to persistence, trends in habitat, and responses to management, or

b. Lack of sufficient scientific information available about the species' status.

12.52c – Criteria for Identifying a Species of Conservation Concern

The criteria for identifying species of conservation concern are also the criteria for identifying potential species of conservation concern.

1. The species is native to, and known to occur in, the plan area.

A species is known to occur in a plan area if, at the time of plan development, the best available scientific information indicates that a species is established or is becoming established in the plan area. A species with an individual occurrences in a plan area that are merely "accidental" or "transient," or are well outside the species' existing range at the time of plan development, is not established or becoming established in the plan area. If the range of a species is changing so that what is becoming its "normal" range includes the plan area, an individual occurrence should not be considered transient or accidental.

2. The best available scientific information about the species indicates substantial concern about the species' capability to persist over the long term in the plan area. See FSH 1909.12, zero code, section 07, for guidance on best available scientific information.

If there is insufficient scientific information available to conclude there is a substantial concern about a species' capability to persist in the plan area over the long-term that species cannot be identified as a species of conservation concern.

If the species is secure and its continued long-term persistence in the plan area is not at risk based on knowledge of its abundance, distribution, lack of threats to persistence, trends in habitat, or responses to management that species cannot be identified as a species of conservation concern.

12.52d – Species to Consider when Identifying Potential Species of Conservation Concern

1. When identifying potential species of conservation concern, the Responsible Official shall consider only species native to, and known to occur in, the plan area.

2. Species in the following categories must be considered:

a. Species with status ranks of G/T1 or G/T2 on the NatureServe ranking system. See exhibit 01 for description of NatureServe Conservation Status Ranks.
Note: Species with NatureServe G/T1 or G/T2 status ranks are expected to be included unless it can be demonstrated and documented that known threats for these species, such as those threats listed for the species by NatureServe, are not currently present or relevant in the plan area.

b. Species that were removed within the past 5 years from the Federal list of threatened or endangered species, and other delisted species that the regulatory agency still monitors.

12.52d - Exhibit 01

NatureServe Conservation Status Ranks

NatureServe conservation status ranks are based on a scale of one to five, ranging from critically imperiled (G1) to demonstrably secure (G5). Status is assessed and documented at three distinct geographic scales: global (G), national (N), and State/province (S). The conservation status of a species or ecosystem is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment. (*http://www.natureserve.org/explorer/ranking.htm*)

Status Rank	Status Rank Definition
1	*Species is Critically Imperiled* At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
2	*Species is Imperiled* At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
3	*Species is Vulnerable* At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
4	*Species is Apparently Secure* At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
5	*Species is Secure* At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

Infraspecific taxa refer to subspecies, varieties, and other designations below the level of the species. The status of infraspecific taxa (subspecies or varieties) are indicated by a T-rank following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.

3. Species in the following categories should be considered:

   a. Species with status ranks of G/T3 or S1 or S2 on the NatureServe ranking system. See exhibit 01 for description of NatureServe Conservation Status Ranks.

   b. Species listed as threatened or endangered by relevant States, federally recognized Tribes, or Alaska Native Corporations.

   c. Species identified by Federal, State, federally recognized Tribes, or Alaska Native Corporations as a high priority for conservation.

   d. Species identified as species of conservation concern in adjoining National Forest System plan areas (including plan areas across regional boundaries).

   e. Species that have been petitioned for Federal listing and for which a positive "90-day finding" has been made.

   f. Species for which the best available scientific information indicates there is local conservation concern about the species' capability to persist over the long-term in the plan area due to:

   (1) Significant threats, caused by stressors on and off the plan area, to populations or the ecological conditions they depend upon (habitat). These threats include climate change.

   (2) Declining trends in populations or habitat in the plan area.

   (3) Restricted ranges (with corresponding narrow endemics, disjunct populations, or species at the edge of their range).

   (4) Low population numbers or restricted ecological conditions (habitat) within the plan area.

12.53 – Evaluating Relevant Information for At-risk Species

The Interdisciplinary Team shall consider available information on the set of at-risk species to understand the ecological conditions necessary to sustain them. The assessment phase focuses on rapidly evaluating available information, not on developing new information, about ecological conditions or about individual species. The assessment report should document information gaps relevant to at-risk species that may be filled in through inventories, plan monitoring program, or research.

Information may come from a variety of sources, including Federal and State agencies, literature, local information on occurrence and population status, subbasin analyses, broad-scale assessments, and information available from local species experts and other organizations.

The Interdisciplinary Team should consider information about at risk species such as the following, when available:

1. Current taxonomy.

2. Distribution (including historical and current trends), especially species known from only a relatively few, discrete locations, and the status of those locations.

3. Abundance (including historical and current trends).

4. Demographics and population trends, including population effects resulting from hunting, fishing, trapping, and natural population fluctuations if available.

5. Diversity (phenotypic, genetic, and ecological).

6. Ecological condition (habitat) requirements at appropriate spatial scales (fine-scale, home range, geographic range).

7. Ecological condition (habitat) amount, quality, distribution, connectivity, status, and trends in the plan area.

8. Ecological function of at-risk species.

9. Important biological interactions and ecological processes, such as periodic fire, flooding, groundwater discharge, and so on.

10. Ecological conditions that are threats or limiting factors to persistence.

11. Influence and occurrence of uncharacteristic natural events like severe wildfire or insect epidemics.

12. Effects of climate change and susceptibility to stressors caused by human disturbances or activities like air and water pollution, invasive species, trails, roads, and dams.

13. Endangered Species Act information, such as reasons for listing and species status, set out in recovery plans and biological opinions, and critical habitat designations.

12.54 – Optional Grouping of Species

In some cases, it may be practical or efficient to group at-risk species for identifying and evaluating relevant information about them because they have similar ecological conditions and habitat needs. If used, groupings should be made based on the ecological conditions necessary to maintain or, in the case of federally listed threatened or endangered species, recover each group member. As a basic approach, groupings may be based on species' needs, for example, with respect to vegetation, successional stage of vegetation, stream size, valley bottom configuration, lake size, proximity, or access to groundwater, or wetland type. Such groupings should consider other key ecosystem conditions used by each species such as vegetation types, structural stages, and hydrogeomorphic factors. Grouping at-risk species in the assessment phase is strictly an analysis and evaluation tool that may be used to improve planning efficiency. When species are grouped in an assessment, the assessment must provide the rationale for doing so. The rationale must:

1. Identify the critical assumption(s) made for the grouping, or for including a species in the group, and explain why the assumption(s) is (or are) reasonable, and

2. Identify any uncertainties associated with including a species in the group and why the grouping is nonetheless reasonable.

Once groups are identified, ecological conditions for individual species in each group may be further described using attributes such as those set out in section 12.53 of this Handbook.

12.55 – Determining the Status of At-risk Species

The Interdisciplinary Team shall determine the status of at-risk species, by considering the existing plan direction, ecological conditions needed to support the species (sec. 12.53 of this Handbook), status of ecological conditions in the plan area (sec. 12.14c of this Handbook), and other relevant information. The assessment should identify influences on ecological conditions needed to support the species, key risk factors to those ecological conditions, and limiting factors both on and off the plan area.

The following is a suggested approach to determining the status of each at-risk species:

1. Describe current distribution of each at-risk species in the plan area.

2. Identify ecological conditions in the plan area necessary to meet the requirements of 36 CFR 219.9(b) for each at-risk species (sec. 12.53 of this Handbook) and at-risk species grouping (sec. 12.54 of this Handbook). These are the ecological conditions to be considered for at-risk species in the assessment.

3. Identify those ecological conditions assessed by the assessment of key ecosystem characteristics. Refer to sections 12.1 and 12.2 of this Handbook for their evaluation.

4. Identify ecological conditions in the plan area necessary to meet the requirements of 36 CFR 219.9(b) for each at-risk species that were not addressed by the assessment of key ecosystem characteristics as follows:

a. Describe the current and likely future status of the ecological conditions necessary to meet the requirements of 36 CFR 219.9(b) for each at-risk species, assuming management continues under the current plan.

b. Compare the species' current and likely future status described in paragraph 4a for each at-risk species to the ecological conditions of the natural range of variation, or an alternative ecological reference model (sec. 12.14b of this Handbook).

c. Assess human-related stressors (for example, roads, human disturbance and displacement, dams) and whether they can be managed under Forest Service authorities.

d. Identify other threats or limiting factors (for example, naturally small and isolated populations, climate change) and whether they can be managed under Forest Service authority.

5. Describe the current and projected overall status of the ecological conditions necessary to meet the requirements of 36 CFR 219.9(b) for at-risk species considering the combined ecological conditions addressed through the assessment of key ecosystem characteristics and, if needed, for specific at-risk species or groupings.

6. For those ecological conditions not currently meeting or expected to meet the requirements of 36 CFR 219.9(b) for at-risk species, describe the potential outcome of the at-risk species status and identify the key risk factors, taking into account factors such as time (for example, short-term, long-term, planning period, generations of species), affected life history requirement (for example, loss of part of foraging habitat, loss of all spawning habitat), or affected population dynamic (for example, loss of recolonization routes).

7. Identify those key risk factors influencing the ecological conditions not expected to meet the requirements of 36 CFR 219.9(b) for at-risk species that are or can be influenced by Forest Service management of the plan area.

8. Describe any differences in likely future status of groups of individuals in the plan area that are known to be or highly suspected to be reproductively isolated and separate from the rest of the individuals of at-risk species.

9. Summarize the overall status of each at-risk species or species group (sec. 12.54 of this Handbook) with explanations of which key risk factors weighed most heavily in determining status. Describe the effect of key risk factors on species in simple terms

such as the level of resulting vulnerability and the trend in that vulnerability. State the conclusions of the vulnerability status process for each species in a way that is helpful in identifying the need for change and in developing plan components that provide the ecological conditions necessary to sustain the species. The Interdisciplinary Team may support conclusions using the "Issue-Rule-Analysis/Application-Conclusion" model (IRAC) as described in FSH 1909.12, chapter 20, section 21.42. Document the resulting information and status evaluation in the planning record.

13 – ASSESSING SOCIAL AND ECONOMIC SUSTAINABILITY AND MULTIPLE USES

Management of the plan area contributes to social and economic sustainability by contributing to social, cultural, and economic conditions in the area(s) of influence and the broader landscape and managing a set of desired social, cultural, and economic conditions within the plan area.

1. These contributions include primarily:

   a. Multiple uses,

   b. Ecosystem services,

   c. Infrastructure, and

   d. The management operations of the National Forest System unit.

2. The assessment should identify and assess available information such as:

   a. Contributions of the plan area to social and economic sustainability,

   b. Social, cultural, and economic conditions affected by management of the plan area,

   c. Risks, stressors, or drivers affecting the contributions or the conditions, and

   d. Sustainability of the contributions .

Exhibit 01 shows examples of this approach.

13 - Exhibit 01

Examples of the plan area's contributions to social and economic sustainability

Recreation

Plan Area Contribution: High quality scenery in the plan area attracts visitors to the area of influence.
Social, Cultural, and Economic Conditions: Recreation and tourism jobs, derived from visitor spending, are a large and increasing percentage in the local economy.
Risk, Driver, or Stressor: Risk of severe fire continues to increase, threatening the quality of the scenery.
Sustainability Issue: Can the plan area be managed to maintain the quality of scenery?
Water Supply and Quality
Plan Area Contribution: Watersheds in the plan area supply neighboring communities with water that meets local water quality standards.
Social, Cultural, and Economic Conditions: Downstream communities and agricultural areas relying on this water source.
Risk, Driver, or Stressor: Increase in population growth and downstream development threatens to reduce downstream flow of water so that demand for water would exceed current public water source capacity.
Sustainability Issue: Can the plan area maintain or increase its delivery of downstream water while maintaining ecological integrity of aquatic habitats?

The assessment should help to focus the work of planning by identifying relationships between the management of the plan area and social, cultural, and economic conditions outside the plan area.

An important source of information for topics related to social and economic sustainability and multiple uses is the Forest Service Natural Resource Manager (NRM). The public may access information about NRM at *http://www.fs.fed.us/nrm/index.shtml*. Forest Service employees may access support and training at *http://fsweb.nrm.fs.fed.us/*.

All of the other information sources referenced in the following individual sections can be found using this general link: *http://www.fs.fed.us/emc/nfma/TIPS/directives.shtml*.

13.1 –Plan Area Contributions to Social, Cultural, and Economic Conditions

National Forests and Grasslands provide a number of contributions that affect social, cultural, and economic conditions. These contributions include ecosystem services and multiple uses from the plan area that provide benefits to people either directly or indirectly. Infrastructure within a plan area may also be important in contributing benefits to people. Management of the planning unit, in terms of its operations, employees, and connection to institutions and people

outside the plan area may also be an important contribution. Exhibit 01 displays some examples of the types of plan area contributions to social and economic sustainability.

13.1 - Exhibit 01

Examples of Plan Area Contributions to Social, Cultural, and Economic Conditions

Multiple Uses

- Recreational settings and opportunities for recreational activities
- The provision of fresh water provided to downstream uses
- Forage for domestic livestock grazing
- Volume of timber or biomass offered for sale
- Opportunities for hunting and fishing

Ecosystem Services

- Amount of carbon sequestered and rate of sequestration of carbon stocks mitigating expansion of greenhouse gases in the atmosphere
- Water quality and aquatic organisms sustained from watersheds in properly functioning condition
- High-quality scenery
- Cultural sites preserved for human use and enjoyment

Infrastructure

- Forest road system that provides recreational access
- Trail system that provides diverse opportunities for recreation
- Utility infrastructure such as powerlines and pipelines that transfers energy to communities
- Water infrastructure that conserves water, provide fishing and boating opportunities, and flood control
- Developed facilities that provide access for recreation, cultural interpretation, and education

Forest Service Presence in the Community

- Contracts to local business from the planning unit
- Engagement of Forest Service employees with local community institutions

The Interdisciplinary Team may also identify and assess existing information that describes the benefits of, or social and economic conditions affected by these contributions. For example, a study may exist that describes the importance to the economy of a ski area in the plan area. The benefits may be described in the form of estimates of monetary value or other descriptions of benefit or social and economic outcomes. This information can help the Interdisciplinary Team to evaluate which contributions of the plan area are important.

The Interdisciplinary Team may identify a set of plan contributions to social and economic sustainability that are most likely to affect the social, cultural, and economic conditions in the area(s) of influence (described in sec.13.2 of this Handbook). These contributions can be a focus for the development of plan components or retaining parts of an existing plan that provide these contributions. The methods or indicators used to describe or quantify contributions in the assessment should also help during subsequent steps in the planning process. The assessment should identify and evaluate existing information about the contributions and convey the manner in which the contribution is likely to affect social, economic, and cultural conditions.

13.11 – Multiple Uses

Multiple use management contributes a range of benefits and services under the Multiple-Use Sustained-Yield Act of 1960 and the National Forest Management Act of 1976. The multiple-use mandate is not exclusive to a single resource or use, and the sustained-yield principle applies to all multiple-use purposes for which the National Forest System lands are administered.

Outdoor recreation, range, timber, watershed, wildlife, and fish, identified in the Multiple-Use Sustained-Yield Act, can all contribute to social and economic sustainability. These uses and other resources contribute to maintaining social cultures and long-standing traditions, connecting people to the land, and providing jobs, income, and quality of life for many Americans and their communities.

Management of the plan area will affect the mix and type of uses that occur in the plan area, which will affect social, cultural, and economic conditions in the area(s) of influence and the broader landscape. In addition, management choices regarding multiple uses influence other multiple uses and elements of ecological sustainability. For example, National Forests and Grasslands are often a source of forage for grazing livestock, which benefit ranchers and local communities. However, such grazing also affects the attractiveness of the grazed area for recreation and the structure and composition of the ecosystem in the grazed area.

The scope of the assessment for each of these multiple uses should be commensurate with the relevance of the use in the plan area. The impacts of multiple uses on ecological sustainability must also be assessed. More detail about assessing these types of stressor impacts is contained in section 12.3 of this Handbook. Sections 13.31 through 13.35 of this Handbook describe what the Responsible Official should identify and evaluate for those multiple uses identified in the Multiple-Use Sustained-Yield Act of 1960.

13.12 – Ecosystem Services

Ecosystem services are a product of functioning ecosystems that affect social, cultural, and economic conditions both within the plan area, in the area(s) of influence and the broader landscape. They are defined in the Planning Rule as:

> ***Ecosystem services.*** **Benefits people obtain from ecosystems, including:**
>
> **(1)** ***Provisioning services,*** **such as clean air and fresh water, energy, fuel, forage, fiber, and minerals;**
>
> **(2)** ***Regulating services,*** **such as long term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation;**
>
> **(3)** ***Supporting services,*** **such as pollination, seed dispersal, soil formation, and nutrient cycling; and**
>
> **(4)** ***Cultural services,*** **such as educational, aesthetic, spiritual and cultural heritage values, recreational experiences and tourism opportunities.** (36 CFR 219.19).

These definitions and categories for ecosystem services provide a framework for considering a range of benefits people may derive from the plan area. Although management actions affect the ecosystem and the level or quality of an ecosystem service, these actions themselves are not ecosystem services.

Management of the plan area will affect the contribution of some ecosystem services, which affect social, cultural, and economic conditions. For example, a cultural service such as access to and protection of a cultural site or area can benefit tourism businesses, cultural values, and traditional uses of nearby communities. A regulating service, such as flood control, can have important beneficial consequences both within and beyond the plan area.

To focus the assessment and, ultimately, the plan development or revision phase of the planning process, the Responsible Official should identify and evaluate key ecosystem services provided by the plan area; rather than trying to identify and evaluate information about all ecosystem services that may be present in the plan area. Key ecosystem services are the ecosystem services that are important in the area(s) of influence or the broader landscape and that are likely to be influenced by the land management plan. The key ecosystem services identified in the assessment are expected to be the initial set of ecosystem services considered in the plan development or plan revision phase of planning. Additional information obtained at later stages of planning may lead to adding or removing key ecosystem services from this initial set.

The Interdisciplinary Team should identify and evaluate available information about each of the identified key ecosystem services such as:

1. The geographic scale at which the plan area contributes the key ecosystem service (for example, watersheds, counties, regional markets, or ecoregions).

2. The conditions and trends of the key ecosystem service.

3. The drivers and stressors (see secs. 12.3 and 13.13 of this Handbook) likely to affect future demand for and availability of the key ecosystem service.

4. The current conditions and trends of the ecosystems or key characteristics of ecosystems (sec. 12.14 of this Handbook) that currently maintain the plan area's key ecosystem service.

5. The influence of lands outside the plan area or other conditions beyond the authority of the Forest Service that influence the plan area's ability to provide the key ecosystem services.

6. The relationship of the key ecosystem service to key social, cultural, and economic conditions (sec. 13.23 of this Handbook).

Guidance related to the assessment of various ecosystem services can be found throughout chapter 10. See exhibit 01 for cross references.

13.12 -Exhibit 01

Sections Where Guidance on Assessing Ecosystem Services Is Located

Topic	Section of this Handbook
Provisioning Services	
Range	Section 13.32
Timber	Section 13.33
Watershed	Section 13.34
Fish, Wildlife, and Plants	Section 13.35
Energy, Minerals, Geologic Hazards	Section 13.5
Regulating and Supporting Services	
Terrestrial, aquatic and riparian ecosystems and watersheds	Section 12.1 and 12.1
Air, soil and water resources	Section 12.2
Carbon	Section 12.4
Cultural Services	
Recreation	Section 13.4
Areas of tribal importance	Section 13.7
Cultural and historic resources and uses.	Section 13.8

13.13 – Infrastructure

Infrastructure within the plan area can have a substantial impact on social, cultural, economic, and ecological conditions both within the plan area and in the broader landscape. Infrastructure can include facilities for energy generation or transport, communications, water delivery, transportation (including airstrips), or recreation. These facilities directly affect conditions and uses within the plan area and may support delivery of goods and services in the broader landscape. Guidance related to the assessment of infrastructure is described in the sections on energy and minerals (sec. 13.5 of this Handbook) and infrastructure (sec. 13.6 of this Handbook). Trends in land use (sec. 13.9 of this Handbook) are an influence that may indicate future needs for infrastructure that should also be recognized in the assessment of infrastructure.

13.14 – Forest Service Presence in the Community

Employees of the Forest Service, partnerships, contracts, or agreements with the Forest Service, and other operations directly and indirectly influence the social, cultural, and economic conditions of the affected communities through demand for local goods and services, contributions to the tax base, and participation in community institutions and activities. While plans do not include staffing and procurement strategies, the presence and impact of Agency resources in the area of influence should be considered.

13.2 – Assessing Social, Cultural, and Economic Conditions

The Responsible Official shall identify and evaluate available information regarding:

1. The social, cultural, and economic conditions in the area(s) of influence (sec. 13.21 of this Handbook),

2. The important social, cultural, and economic influences affecting the plan area (sec. 13.22 of this Handbook), and

3. How the plan area influences social, economic, and cultural conditions in the area of influence and in the broader landscape (secs. 13.23 and 13.24 of this Handbook).

13.21 – Social, Cultural, and Economic Conditions in the Area(s) of Influence

The Responsible Official should identify and describe a primary area of influence to serve as the spatial scale to evaluate social, cultural, and economic conditions. The primary area of influence is where the management of the plan area substantially affects social, cultural, and economic conditions.

The Responsible Official may choose to identify and evaluate other areas of influence if there are different spatial areas for certain important economic, social, or cultural influences of the plan area.

The Responsible Official shall solicit public input and conduct intergovernmental outreach to determine the appropriate boundaries of the area(s) of influence. The area(s) of influence should be commensurate with the important influences of the plan area on social, cultural, and economic conditions. Consider the availability of information when identifying boundaries; for example, demographic and some cultural information are often available at the level of counties, so the primary area of influence may be a set of counties. This area of influence can be used later to describe social, cultural, and economic effects of the plan alternatives in the environmental impact statement (EIS) for a plan revision.

The area of influence does not include distant areas where members of the public have an interest in, or occasionally use the plan area unless social, cultural, and economic conditions in that more distant area would be substantially affected by the management of the plan area. For example, the interest of mountain bicyclists in Texas who travel to a national forest in Colorado for recreation, does not lead to parts of Texas being included in the area of influence of that national forest unless the potential change in mountain biking would substantially affect the social, cultural and economic conditions in Texas. Such influences of the plan area to more distant interests can be recognized as a consideration of the effect of the plan on the broader landscape (sec. 13.24 of this Handbook) , but it does not lead to evaluation of social, cultural and economic conditions in the distant area as part of the area of influence.

The Interdisciplinary Team should identify and evaluate available information about the area of influence that may include, but is not limited to:

1. Basic demographic data such as age, gender, population migration or density, education, and home ownership.

2. Minority and low-income populations as defined by Executive Order 12898 that warrant particular consideration for environmental justice.

3. Safety information about risks to the public related to the plan area.

4. Important cultural traditions.

5. Communities within the area of influence and their characteristics (for example, urban, rural, suburban).

6. Important sectors of the economy.

7. Employment and unemployment.

8. Levels and sources of household or per capita income (such as wages and transfer payments).

9. Language diversity and English proficiency, consistent with Executive Order 13166 (Improving Access for Persons with Limited English Proficiency).

13.22 – Important Social, Cultural, and Economic Influences on the Plan Area

The Interdisciplinary Team should briefly describe the types of social, economic, or cultural dynamics that affect the plan area, in all seasons. This information can also be used to help identify how social and economic trends may impact ecological conditions and integrity.

These may include:

1. Demand from local, regional, State, tribal, and national interests, and the public for specific resources and ecosystem services including, but not limited to, clean air and water, flood risk management, recreation opportunities (motorized and nonmotorized, passive and active) forest products, minerals and food, and fiber production.

2. Interest in specific uses, environments, or management, including requests for specific treatments, restoration activities, or fire management strategies.

3. Cultural needs related to traditional and historic uses of the plan area by various communities, Indian Tribes, and Alaska Native Corporations.

4. Economic trends such as fragmentation from land use changes and broader economic conditions that are influencing the plan and the area of influence.

13.23 – Influence of the Plan Area on Social, Cultural, and Economic Conditions in the Area(s) of influence

Information about the social, cultural, and economic conditions in the area(s) of influence (sec. 13.22 of this Handbook) should be used to help identify what are the social, cultural, and economic conditions that are most affected by the management of the plan area. Some social, cultural, and economic conditions in the area of influence are sensitive to changes in the management of the plan area while others are not. Social, cultural, and economic conditions in the area of influence that are neither sensitive to, nor affect, the management of the plan area may not merit further detailed analysis in the planning process. The assessment should identify the social, cultural, and economic conditions that are sensitive to the management of the plan area.

1. The Interdisciplinary Team should identify and evaluate available information about the plan area's relationship to the social, cultural, and economic conditions in the area(s) of influence, such as:

a. Connection between the contributions of the plan area and the social, cultural, and economic conditions.

b. Trends affecting the social, cultural, and economic conditions.

c. Opportunities for the plan area contributions to help in sustaining social, cultural, and economic conditions.

2. When identifying and evaluating the relationship of the plan area to social conditions, the Interdisciplinary Team may consider conditions such as:

a. Activities and traditions that connect people to the plan area such as recreation, education, and interpretation activities and opportunities.

b. Sense of place (special value people associate with an area) within the plan area.

c. Settlement patterns, land-use change, and land-use conflicts within or near the plan area.

d. Influence of the plan area on community health and safety, including conditions such as frequency of accidents, pollution, or crime. This includes consideration of impacts from the plan area on environmental justice populations as identified in Executive Order 12898.

e. Other conditions and trends described in sections 13.3 and 14 of the Handbook.

3. When identifying and evaluating the relationship of the plan area to cultural conditions, the Interdisciplinary Team may consider conditions such as:

a. Activities, traditions, cultural events, and values of the community that are linked to the plan area.

b. Historical legacies and cultural or artistic connections between the plan area and communities.

c. Location of and access to fishing, hunting, or plant harvesting areas within or near the plan area.

d. Other conditions and trends described for the resources and designated areas described in sections 13.3 through 14 of this Handbook, including section 13.8 about cultural and historic resources and uses in the plan area.

4. When identifying and evaluating the relationship of the plan area to economic conditions, the Interdisciplinary Team may consider conditions such as:

a. Economic contributions of multiple uses and ecosystem services in the plan areas as described in sections 13.3 through 14 of this Handbook and opportunities derived from recreational visitors that generate local business opportunities.

b. Role of infrastructure within the plan area in supporting economic activity in the area of influence.

c. Economic contributions from Forest Service expenditures of the plan unit including employment and income of Forest Service employees, nonsalary expenditures of the Forest Service, and payments to local governments if influenced by the land management plan.

d. Aesthetics of the plan area that may enhance the attractiveness of the area for residents or businesses.

e. Indirect and induced economic impacts generated by the direct contributions of plan area in items a, b, and c of this list.

13.24 – Influence of the Plan Area on Social, Cultural, and Economic Conditions in the Broader Landscape

In addition to the influence of the plan area on social, cultural, and economic conditions in the area of influence, the management of the plan area may have substantial influences that extend

beyond the area(s) of influence. These influences may include an influence to communities of interest who have a particular relationship to the plan area, such as the example of mountain bicyclists in Texas related to national forests in Colorado (sec. 13.21 of this Handbook). In some cases, these contributions may be important at a national or international scale. The assessment should identify these social, cultural, and economic connections of the plan area to the broader landscape and evaluate how management of the plan area may affect these connections. These connections may include some of the relationships described in section 13.23 of this Handbook considered at a broader scale.

1. The Interdisciplinary Team should identify and evaluate available information about the plan area's contributions to the social, cultural, and economic conditions in the broader landscape, such as:

a. Recreation opportunities present in the plan area that are sought by distant recreationists and recreational interests. These may include opportunities such as mountain climbing, river rafting, downhill or cross country skiing, riding off highway vehicles, or scenic driving. These opportunities help to support distant businesses connected with the manufacture or sale of recreation equipment or services related to recreation.

b. Unique landscape scenery in the plan area that is widely known and recognized as contributing the attractiveness of the broader landscape. This may include designated areas within the plan area.

c. Resources within the plan area such as fish, game, and plants that attract distant visitors not only for recreation but also for food.

d. Resources within the plan area that may be used as goods and services and contribute to the economy of the broader landscape. This can include contributions of water, timber, livestock, mineral or energy resources that are used in various agricultural, manufacturing, or other businesses.

e. Infrastructure that provides transportation between distant areas or delivers goods and services such as energy or electricity to more distant locations.

13.25 – Sources of Existing Information for Social, Cultural, and Economic Conditions

A variety of sources related to social, cultural, and economic conditions may provide relevant information for the assessment (secs. 13.2 through 13.9 of this Handbook). References to these sources of information can be found at:
http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10social.shtml.

13.3 – Assessing Multiple Uses

The scope of the assessment for each of the following uses listed in the Multiple-Use Sustained-Yield Act should be generally commensurate with the current levels and potential of use in the plan area.

13.31 – Outdoor Recreation

See section 13.4 of this Handbook for guidance regarding assessment of the plan area's recreation settings, opportunities, access, and scenic character.

13.32 – Range

Range encompasses permanent forage-producing rangelands and temporary or transitory forage-producing conditions (such as after timber harvest or fire) that may sustain ungulate species of wildlife or to graze domestic livestock. If domestic livestock grazing occurs in the plan area, the assessment should identify and evaluate available information about how the plan area currently provides grazing forage for domestic livestock and ungulate species on both permanent rangelands and transitory range in forested landscapes. Section 12.1 of this Handbook gives guidance about assessing sustainability of specific ecosystems associated with rangelands, such as sagebrush, grasslands, and meadows.

The Interdisciplinary Team should identify and evaluate available information about range such as:

1. The current range condition in the plan area and trends influencing the range conditions. Relevant information can include current diversity and proportion of grazing arrangements within the plan area (for example, collaborative experiments, conventionally grazed lands, non-use areas).

2. The current level of grazing activity in the plan area and within the broader landscape.

3. The capability and productivity of the plan area to support grazing activity.

4. The impacts of grazing on ecological integrity and species diversity.

5. The contribution of grazing in the plan area to social, economic, and ecological sustainability. This may include the contributions of grazing in the plan area to social, cultural and economic conditions of communities outside the plan area.

References to a variety of internal and external sources related to range that may provide relevant information for the assessment can be found at:
http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10range.shtml.

13.33 – Timber

Timber harvest and production can play an important role in attaining desired conditions for ecological sustainability and can contribute to social and economic sustainability. The assessment should identify and evaluate available information about how timber harvest and production contribute to social, economic, and ecological sustainability.

The Interdisciplinary Team should identify and evaluate available information such as:

1. The current condition of forests in the plan area including standing inventory, age classes, growth, and mortality.

2. The current levels of timber harvest and production in the plan area, including the purposes of timber harvest, outcomes of harvest activity, and ways in which timber is harvested (such as timber sales, stewardship contracts, or harvest incidental to other uses).

3. The current levels timber harvest and production in the broader landscape.

4. The GIS data and other information relevant to identifying land that may be suitable for timber production. (See FSH 1909.12, ch. 60).

5. The ability of timber harvest to affect forest resistance and resilience to stressors such as fire, insects, and disease.

6. The ability of timber harvest to maintain or restore key ecosystem characteristics of ecological sustainability (sec. 12 of this Handbook).

7. The current capacity and trend for logging and restoration services and infrastructure for processing wood within the broader landscape.

8. Trends that drive the supply and demand for timber in the plan area.

9. The impacts of timber harvest on ecological integrity and species diversity.

10. Contribution of timber harvest and production in the plan area for ecological, social, and economic sustainability.

References to a variety of internal and external sources related to timber that may provide relevant information for the assessment can be found at:
http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10range.shtml.

13.34 – Watershed

The assessment should identify and evaluate available information about the contribution of watersheds and water resources to social and economic sustainability. This evaluation can build on information developed to support that part of the assessment that addresses ecological sustainability (sec.12.23 of this Handbook). The Interdisciplinary Team should identify and evaluate available information such as:

1. The contribution of water resources within the plan area for use and enjoyment by the public, both consumptive use including water withdrawals and diversions for agricultural, municipal, and commercial uses and non-consumptive use including water storage for flood control, hydropower, and recreation.

2. The conditions and trends related to water use and enjoyment in the plan area and the broader landscape.

3. The impacts of human water use on watersheds, ecological integrity and species diversity.

4. The impacts of human activities and multiple uses on watershed.

5. The role of water and watersheds in supporting other uses (recreation, hunting and fishing, special uses, cultural uses, and scenery).

6. Contribution of use and enjoyment of water from the plan area to social and economic sustainability

References to a variety of internal and external sources related to water and watershed that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10watershed.shtml*.

13.35 – Fish, Wildlife, and Plants

The fish, wildlife, and plants of National Forest System lands are an important resource enjoyed by people in a variety of ways. This section provides guidance for assessing the contribution of fish, wildlife, and plants to social and economic sustainability. Guidance for assessing ecological conditions that support fish, wildlife, and plants is within sections 12.1 through 12.42 of this Handbook. Guidance for identifying at-risk species is within sections 12.5 through 12.55 of this Handbook.

The Interdisciplinary Team should identify and evaluate available information such as:

1. Fish, wildlife, and plant species commonly enjoyed and used by the public for hunting, fishing, trapping, gathering, observing, or sustenance, including cultural or tribal uses.

2. The conditions and trends in the plan area associated with these species and their uses.

3. The impacts of hunting, fishing, or plant collection on ecological integrity and species diversity

4. The contribution of the use and enjoyment of these species to social and economic sustainability.

References to a variety of internal and external sources related to fish, wildlife, and plants that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10wildlife.shtml*.

13.4 – Assessing Recreation Settings, Opportunities and Access, and Scenic Character

Recreation contributes to social and economic sustainability and provides opportunities to connect people with nature. The focus of the assessment for recreation is to identify and evaluate available information about existing conditions, trends and sustainability of recreation settings, opportunities, uses, preferences, access, and scenic character. Conditions and trends are assessed within the plan area as well as in relation to the broader landscape. Information pertaining to both recreation and scenery can also be found in sections 12.3, 13.1 to 13.3, 13.6, 13.8, 13.9, and 14 of this Handbook.

The Interdisciplinary Team shall identify and evaluate available information about recreational settings and opportunities, including seasonal variation, using the Recreation Opportunity Spectrum (ROS). The Team shall also identify and evaluate available information about the existing and potential scenic character of the plan area based on maps and other information using the Scenery Management System. The Team shall also consider information provided by the public regarding recreation opportunities, activities, and scenery that are not covered in the Recreation Opportunity Spectrum, the Scenery Management System or the National Visitor Use Monitoring system.

Based on this information and other information as described below or identified by the public, the Responsible Official should assess the extent to which the plan area meets the demand for recreational opportunities and the ability of the plan area to sustain these recreation settings, opportunities, access, and scenic character.

1. The Interdisciplinary Team should identify and evaluate additional available information about recreation and scenic character of the plan area such as:

a. The types of recreational opportunities including both motorized and nonmotorized opportunities currently available in the plan area including their distribution and seasonal variation and the natural features and topography that enable the recreational opportunities.

b. The important recreational sites or areas in the plan area and their condition, including their safety for recreational activities.

c. The relationship among recreation activities, including the degree of compatibility or incompatibility.

d. The nature, extent, and condition of trails, roads, facilities, and other transportation and other infrastructure to provide recreational access (see also sec. 13.6 of this Handbook).

e. The opportunities within the plan area to foster greater connection between people and nature through education, experience, recreation, and stewardship.

f. The conditions and trends that are affecting the quality of recreational settings and scenic character in the plan area.

g. Information about the sustainability of the set of recreation settings, opportunities, access, and scenic character.

h. The potential of the plan area to expand or enhance existing, sustainable recreational opportunities and to offer new, sustainable recreational opportunities consistent with present or anticipated future public demand.

i. The impacts of recreation on ecological integrity and species diversity.

j. The contribution of recreation in the plan area to social, economic and ecological sustainability.

2. In addition, the Interdisciplinary Team should consider how influences outside the plan area may influence the demand for recreation in the plan area or the ability of the plan area to meet those demands. The Interdisciplinary Team should consider information such as:

a. The preferences of the public and demand for specific recreation opportunities or settings.

b. The availability of recreation opportunities on other lands within the broader landscape.

c. The stated goals in approved plans or other published reports of Tribes, States, or local governments for recreational opportunities in the plan area.

d. The social, cultural, and economic conditions or trends such as changing population demographics, traditional uses, or income levels that influence the demand for various types of recreation activities.

e. The emerging new or unique recreational trends or interests that may affect future demand for recreation in the plan area.

f. The issues or dynamics involved in social, cultural, or economic conditions that may prevent or preclude minorities and, other underrepresented groups from seeking, accessing, or participating in recreational activities typically demanded by others.

g. The regional, national, or international significance of the recreation settings and opportunities in the plan area when viewed within a larger landscape.

References to a variety of internal and external sources related to recreation and scenic character that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10recreation.shtml*.

13.5 – Assessing Renewable and Nonrenewable Energy Resources, Mineral Resources and Geologic Hazards

The assessment should identify and evaluate available information about the contribution of renewable and nonrenewable energy and mineral resources to social and economic sustainability. Internal and external information resources related to renewable and nonrenewable energy, minerals, and geologic hazards are available.

References to a variety of internal and external sources related to renewable and nonrenewable energy resources, mineral resources and geologic hazards that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10energy.shtml*.

13.51 – Renewable Energy Resources

Renewable energy sources may include wind, hydropower, solar, biomass, and geothermal. Federally-managed geothermal resources are managed under mineral regulations and are discussed at section 13.52 of this Handbook.

The Interdisciplinary Team should identify and evaluate available information such as:

1. Projections of renewable energy activity.

2. Potential of the plan area to provide renewable energy.

3. Trends that affect renewable energy activity in the plan area.

4. Existing energy transmission corridors and the potential need for new transmission corridors.

5. The impacts of renewable energy on ecological integrity and species diversity.

6. The contribution of renewable energy in the plan area to social and economic sustainability.

13.52 – Nonrenewable Energy and Mineral Resources

Energy and mineral resources provide raw materials that contribute to modern society. Each type of nonrenewable energy or mineral resource within the plan area requires consideration of applicable laws, jurisdiction of other Federal or State agencies, and valid existing rights, including non-Federal (that is, reserved and outstanding, or other private) mineral rights. The Forest Service has sole discretion in managing mineral materials or salable minerals in the Federal estate. Forest Service authority varies for other nonrenewable and energy resources based on the class of mineral involved (locatable, or leasable), the land status, and mineral ownership. Since the Forest Service does not have its own regulations for leasable commodities other than oil and gas, the Forest Service implements its program responsibilities for coal, geothermal, oil shale, tar sands, and other solid minerals through statutory language and via references to surface management agency responsibilities contained in Chapter 43 of the Code of Federal Regulations.

1. Regulations pertinent to specific mineral and nonrenewable resources are detailed below:

   a. Coal resource management (43 CFR part 3420),

   b. Geothermal resource leasing (43 CFR part 3201),

   c. Solid leasable minerals other than coal and oil shale (43 CFR 3501.17),

   d. Oil shale (43 CFR 3900.5),

   e. Tar sands (43 CFR 3140),

   f. Locatable minerals (36 CFR part 228, subpart A),

g. Disposal of mineral materials (36 CFR part 228, subpart C), and

h. Oil and gas (36 CFR part 228, subpart E, section 228.102(c) and 43 CFR 3100).

2. Nonrenewable energy resources and mineral resources to be identified and evaluated in the assessment include the following:

a. Locatable minerals on public domain lands subject to the general mining laws and regulations (36 CFR 228 and 30 U.S.C. 22 et seq.) that include gold, silver, copper, molybdenum, and other minerals with unique properties.

b. Nonrenewable energy resources that generally include oil, natural gas, coal, oil shale, and tar sands. Where these minerals are part of the Federal mineral estate, they fall within the category of leasable minerals.

c. Non-energy leasable minerals that include phosphate, potassium, sodium, sulfur, gilsonite, asphalt, and hardrock minerals on acquired lands where the subsurface is owned by the Federal Government.

d. Geothermal energy resources.

e. Mineral materials (also referred to as salable minerals) that include common varieties of sand, gravel, stone, and other similar materials.

3. The Interdisciplinary Team should identify and evaluate available information about nonrenewable energy resources and mineral resources in the plan area such as:

a. Potential for occurrence of nonrenewable energy and mineral resources.

b. Current type, extent, and general location of nonrenewable energy and mineral activity and energy facilities in the plan area.

c. Information on previous decisions related to the Federal mineral estate including oil and gas availability decisions and coal suitability evaluations.

d. Projections of potential of nonrenewable energy and mineral activity or reasonably foreseeable development in the case of oil and gas.

e. Trends in nonrenewable energy and mineral activity in the plan area.

f. Known abandoned mines or mining related hazards in need of reclamation or restoration.

g. Noncommercial mineral collecting activities.

h. The impacts of nonrenewable energy and mineral developments on ecological integrity and species diversity.

i. The contribution of nonrenewable energy and mineral activity in the plan area to social and economic sustainability, including taxes, royalties, and fees.

The Bureau of Land Management (BLM) manages the Federal mineral estate for locatable and leasable mineral resources and has specific authorities and expertise in managing Federal minerals. Depending on the type and amount of the mineral resource occurrence in the plan area, coordination with BLM during the assessment may be warranted. For plan areas with Federal coal resource potential, the Responsible Official shall request an estimate of the coal development potential from the BLM for the plan assessment (43 CFR 3420.1-4((e)(1)).

13.53 – Geologic Hazards

The Interdisciplinary Team should also identify and evaluate available information about large, broad-scale, and major geologic hazards, including landslides, rock falls, mud flows, debris flows, snow avalanches, earthquakes, karst collapse, volcanoes, flooding, subsidence, acid-producing rock, and naturally occurring gases and minerals, such as asbestos, erionite, radon, and methane. In particular, the team should identify and evaluate hazardous geologic conditions in proximity to communities, infrastructure, established recreation areas, and other high use areas.

13.6 – Assessing Infrastructure

The assessment should identify and evaluate available information about the contribution of infrastructure to social and economic sustainability. The Interdisciplinary Team should identify and evaluate available information such as:

1. The location and condition of infrastructure within the plan area. The plan area's infrastructure includes the forest road system, recreational infrastructure (such as developed facilities, trails, resorts, and recreational residences), airstrips, administrative facilities, dams, water diversions, fences, communication towers, and bridges within the plan area. This information is for basic understanding of the role of infrastructure in the plan area, not to make evaluations about specific facilities.

2. The influence of infrastructure external to the plan area or outside of Forest Service authority that is relevant to the management of the plan area. An example of such infrastructure is a State or county road with important connections to the Forest Service road network.

3. Trends that may affect the condition or development of infrastructure within the plan area. These trends include increasing populations or land use changes affecting needs for access and infrastructure to support current and future potential resource uses such as recreation, grazing, and mineral and energy development.

4. Information about the sustainability of the infrastructure, including planning unit's fiscal capability to maintain existing infrastructure and the current backlog of infrastructure maintenance.

5. Previously developed plans, assessments, reports or other materials such as travel management plans related to infrastructure in the plan area.

6. The impacts of infrastructure on ecological integrity and species diversity.

7. The infrastructure's contribution to social and economic sustainability.

References to a variety of internal and external sources related to infrastructure that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10infrastructure.shtml*.

13.7 – Assessing Areas of Tribal Importance

The assessment must recognize areas of tribal importance. The Interdisciplinary Team should identify and evaluate available information about:

1. Federally recognized Tribes, intertribal organizations, and Alaska Native Corporations associated with the plan area.

2. Existing tribal rights, including those involving hunting, fishing, gathering, and protecting cultural and spiritual sites.

3. Areas in the plan area or affected by management of the plan area that are known to be of importance to federally recognized Indian Tribes, intertribal organizations, and Alaska Native Corporations.

4. Conditions and trends of resources that affect areas of tribal importance and tribal rights.

The Responsible Official shall protect confidentiality regarding information that is culturally sensitive information to an Indian Tribe or Tribes as required by 36 CFR 219.1(e):

> **(e) During the planning process, the responsible official shall comply with Section 8106 of the Food, Conservation, and Energy Act of 2008 (25 U.S.C. 3056), Executive Order 13007 of May 24, 1996, Executive Order 13175 of November 6, 2000, laws, and other requirements with respect to disclosing or withholding under the Freedom of Information Act (5 U.S.C. 552) certain information regarding reburial sites or other information that is culturally sensitive to an Indian Tribe or Tribes.**

The Responsible Official should request information from Indian Tribes about these areas of tribal importance. If available, memoranda of understanding with local Tribes may be helpful sources of information about such areas. The Responsible Official should also consider relevant tribal consultation reports and analysis from Forest Service Research Stations.

FSH 1909.12, chapter 40, section 43 of, has additional information on tribal consultation for planning.

References to sources of information related to areas of tribal importance that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10tribal.shtml*.

13.8 – Assessing Cultural and Historic Resources and Uses

The assessment should identify and evaluate available information about the contribution of cultural and historic resources and uses to social and economic sustainability. These cultural resources include priority heritage assets as defined in FSM 2360.5 within the plan area and all officially designated historic properties. Priority heritage assets would include those cultural and historic assets that have already been recognized as having importance in the plan area.

Benefits of cultural and historic resources can include expanded knowledge and understanding of history, cultural, and spiritual connections to our heritage, scientific data about past cultures or historical conditions, human adaptation to past climatic events and similar matters, and tourism that benefits rural economies.

The Interdisciplinary Team should identify and evaluate available information such as:

1. The cultural and historical context of the plan area within the broader landscape.

2. The cultural and historic resources, including heritage assets present in the plan area.

3. The condition of known cultural and historic resources, including historic properties in the plan area identified as eligible or listed in the *National Register of Historic Places* at *http://www.nps.gov/nr/* and designated traditional cultural properties.

4. The trends that affect the condition of, or the demand for, cultural and historic resources or cultural uses, including influences of public use and Forest Service management.

5. The opportunities within the plan area to foster greater connection between people and cultural and historic resources and landscapes beyond the plan area.

6. The contribution of the use and enjoyment of cultural and historic resources to social, economic, and ecological sustainability.

References to a variety of internal and external sources related to cultural and historic resources and that may provide relevant information for the assessment can be found at: *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10cultural.shtml*.

Some information in these internal and external sources of information may be considered protected or confidential and may not be made available for public dissemination even under the Freedom of Information Act. See FSM 2360.91 concerning the use, storage, and dissemination of information concerning cultural and historic resources.

13.9 – Assessing Land Status and Ownership, Use, and Access Patterns

The assessment should include information describing how land status, ownership, use, and access patterns influence the plan area and how management of the plan area may influence land use and access.

Land ownership and land status are the basic pattern of public and private ownership of both surface and subsurface estates and legal restrictions and permissions on the use of the land. Land ownership and land status includes public domain lands, acquired lands (and the authority under which they were acquired), lands with the reserved or outstanding mineral rights, existing rights of way, leased lands, withdrawals of lands from mineral entry or other uses, and lands in designated areas described in section 14. Land ownership and land status also includes Indian Trust lands and Treaty rights to animals and fish of the plan area. Private land inholdings within the proclaimed boundaries of National Forests and Grasslands but outside of the plan area are also part of land ownership considerations as they influence management of the plan area.

Land status also refers to planning, zoning, easements, or other legal designations for private lands and formal management status of other public lands (such as national parks, state forests, and local parks).

Land use is the current use of land, such as residential, commercial, industrial, or agricultural use for private lands, and current land allocations and the uses permitted in existing land management plans for National Forest System or other public lands. Permitted land uses under local government authorities may provide important information about how future changes in land use may affect management of the plan area.

Access is the ability to move to, from, or through the plan area by any means including pedestrian access from properties adjacent to the plan area and air access to airstrips in the plan area.

The Interdisciplinary Team should identify and evaluate available information such as:

1. Existing patterns of land ownership, status, and use both within the plan area and outside the plan area in neighboring lands.

2. Trends affecting land status, ownership, and use with particular attention to trends within or near the plan area's boundary.

3. Influence of the plan area on land ownership, status, and use within the broader landscape.

4. Access to, from or through the plan area for various modes of transportation (ranging from pedestrian to aircraft) and from urban and rural locations near the plan area.

5. Opportunities to provide open space connections with lands in other ownerships.

6. Trends of land status and ownership affecting access to the plan area and how these trends affect use of the plan area.

7. Influence of these conditions and trends of land ownership, status, use, and access on social, cultural, economic, and ecological conditions.

References to a variety of internal and external sources related to land ownership, status, use and access that may provide relevant information for the assessment can be found at *http://www.fs.fed.us/emc/nfma/TIPS/directives/ch10land.shtml*.

14 – ASSESSING DESIGNATED AREAS

Designated areas are specific areas or features within the plan area that have been given a permanent designation to maintain its unique special character or purpose. Some categories of designated areas may be established only by statute (statutorily designated areas or often called Congressionally designated areas) and other administrative processes of the Federal executive branch may establish some categories administratively (administratively designated areas). Certain purposes and restrictions are usually established for designated areas, which greatly influence management needs and opportunities associated with them.

Exhibit 01 of this section lists the types of statutorily designated areas and administratively designated areas that may be present or potentially designated in National Forest System plan areas; and the administratively designated areas that the Regional Forester may designate. This exhibit is not comprehensive, as plan areas may have other types of existing designated areas established by specific legislation or other administrative action that is unique to the plan area.

The assessment should identify designated areas established within the plan area.

The Interdisciplinary Team should identify and evaluate available information about designated areas including:

1. Types, purposes, and locations of established designated areas within the plan area. The Responsible Official should use a map to identify these locations, unless the location of the designated area must remain confidential for resource protection.

2. Range of uses, management activities, or management restrictions associated with the established designated areas in the plan area.

3. Existing plans for the management of established designated areas within the plan area, such as comprehensive plans for national scenic or historic trails.

4. Potential need and opportunity for additional designated areas. The Interdisciplinary Team should identify and evaluate available information to answer questions such as:

a. Are there published documents or proposals that identify an important need or potential for a designated area? For example, a research report may indicate a need for an experimental forest within the plan area.

b. Are there other proposals for designated areas before Congress, in proposals from collaborative efforts or from previous plans?

c. Are there specific land types or ecosystems present in the plan area that are not currently represented or minimally represented?

d. Are there rare or outstanding resources in the plan area appropriate to specific types of designated areas?

e. Are there known opportunities to highlight unique recreational or scenic areas in the plan area to provide for sustainable recreation opportunities?

f. Is there scientific or historical information that suggests a unique opportunity to highlight specific educational, historic, cultural, or research opportunities?

g. Has a need or opportunity for specific designated areas been identified in the plans of States, Tribes, counties, and other local governments?

h. Are there known important ecological roles such as providing habitat or connectivity for species at risk that could be supported by designation?

5. How do designated areas contribute to social, economic, and ecological sustainability?

Assessing designated areas under items 4 and 5 in the preceding list does not require an identification and evaluation of every potential designated area that could apply in the plan area. It is a review of existing information to evaluate what opportunities have been identified in the area and what needs could be met with designated areas.

Before the Responsible Official invites comments on the proposed plan, an inventory and evaluation is required for lands that may be suitable for inclusion in the National Wilderness Preservation System (see FSH 1909.12, ch. 70), and an inventory of the eligibility of rivers for inclusion in the Wild, and Scenic Rivers System is required (see FSH 1909.12, ch. 80). These inventories may begin during or after the assessment using existing information to the extent possible, and must provide opportunities for public and intergovernmental participation. The inventories may only become final and evaluation of the inventories may only begin after the assessment is complete. The inventories and evaluation are not completed until the final environmental impact statement is published.

14 - Exhibit 01

Designated Areas

Designated Areas
Statutorily Designated Areas
National Heritage Area
National Monument*
National Recreation Area
National Scenic Area
National Scenic and Historic Trails
Wild and Scenic River
Wilderness, or Wilderness Study Areas
Highway Systems, Interstate and National
Administratively Designated Areas
Critical Habitat under ESA
Experimental Forest or Range
Inventoried Roadless Areas or Roadless Areas designated under state rules in 36 CFR Part 294
National Natural Landmark
National Historic Landmark
National Monument*
National Recreation Trails
Research Natural Area
Scenic Byway – Forest Service
Scenic Byway – National
Significant Caves
Wild Horse and Burro Territories
Regional Forester Administratively Designated Areas
Botanical Area
Geological Area
Scenic Area
Zoological Area
Paleontological Area
Historical Area
Recreational Area

* National Monuments may be congressionally or administratively designated.

15 – ASSESSMENTS FOR PLAN AMENDMENTS

> **(c) Plan amendment assessments. Where the responsible official determines that a new assessment is needed to inform an amendment, the responsible official has the discretion to determine the scope, scale, process, and content for the assessment depending on the topic or topics to be addressed.** (36 CFR 219.6)

An assessment is not required to amend a plan (FSH 1909.12, ch. 20, sec. 21.2. Other documentation, such as a monitoring evaluation report or other source of new information indicating changed conditions in the plan area, may suffice to determine the need for an amendment. However, the Responsible Official may determine that an assessment is useful, to identify relevant available information and evaluate conditions and trends of social, cultural, economic, and ecological systems relevant to the issues that indicate an amendment may be needed. The breadth, scale and complexity of the issues would typically determine the breadth, scale, and complexity of the assessment.