

Chapter 2 - BACKGROUND

2.0 Background

This chapter presents a brief orientation to the historic and current activities and social aspects of the Lake Tahoe Basin. A detailed discussion of the Pathway 2007 agencies' planning requirements is provided. More extensive background information can be found in the *Lake Tahoe Watershed Assessment*¹ and the existing planning documents for each of the Pathway 2007 agencies. The Pathway 2007 process for collaboration in establishing the direction and goals for the future of the Lake Tahoe Basin is also detailed in this chapter.

2.1 Historical, Physical and Socio-Economic Orientation

Two distinct periods stand out in the modern history of the Lake Tahoe Basin. Prior to the 1850s the Lake Tahoe Basin was used and managed primarily by the Washoe. The Comstock Era from the 1850s to 1900 brought widespread logging to the Lake Tahoe Basin to supply the needs of mining operations in Nevada. These activities left the Lake Tahoe watershed largely deforested by 1910. Sediment core samples taken from Lake Tahoe show a corresponding period of increased erosion.

The first half of the 20th century saw the beginnings of forest regeneration and modest tourist and economic activity. The modern urbanization of the Lake Tahoe Basin began in the 1950s with the Winter Olympic Games at Squaw Valley in 1960 exposing Lake Tahoe to millions of visitors for the first time. The development since that time is responsible for much of the erosion that has led to losses in Lake Tahoe clarity over the past forty years.

Table 2-1 presents some basic statistics related to the recent physical and socioeconomic setting of the Lake Tahoe Basin.

Planning Background: The Naming of "Tahoe"

An exploration party, led by John C. Fremont, accidentally discovered the Lake Tahoe Basin while searching for the mythical Buenaventura River (purportedly flowing into the San Francisco Bay). An era of discovery, geological survey and mapping followed, including name changes "Lake Bonpland" in honor of a French botanist and explorer of North America, Fremont's attempt at renaming it "Mountain Lake", California's official mapmaker naming it "Lake Bigler" in honor of John Bigler – the state's third governor, and an unsuccessful attempt to change the name to "Tula Tulia" in 1861. Finally, federal maps issued from Washington, DC in 1862 reflected "Tahoe"- the Native American name most commonly accepted – thanks to a campaign by geological surveyor and Lake Tahoe Basin admirer William Henry Knight.

¹USDA (United States Department of Agriculture). 2000. *Lake Tahoe Watershed Assessment. Volume 1*. Pacific Southwest Research Station, USDA Forest Service.

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Table 2-1: Lake Tahoe Region physical and socioeconomic statistics.

Factor	Statistic	Data Source
Lake Tahoe Elevation	6,225 feet	http://tahoe.usgs.gov/facts.html on 9/10/05
Highest Peak (Freel)	10,891 feet	http://tahoe.usgs.gov/facts.html on 9/10/05
Watersheds and Coastal Drainage Areas	63	Lake Tahoe Watershed Assessment
Land Area in Basin	207,562 acres	Lake Tahoe Watershed Assessment
Lake Area	121,110 acres	Lake Tahoe Watershed Assessment
Percent Land Area Publicly Owned	87%	Lake Tahoe Watershed Assessment
Full Time Residents	56,000	2001 Threshold Evaluation Report
Part Time Residents	35,000	Lake Tahoe Watershed Assessment
Annual Population Growth Rate Lake Tahoe Region	0.4%	2001 Threshold Evaluation Report
Annual Population Growth Rate Lake Tahoe Counties	2.5%	2001 Threshold Evaluation Report
Full and Part-Time Jobs Lake Tahoe Region	49,500	2001 Threshold Evaluation Report
Earnings from Jobs Lake Tahoe Region	\$1.3 billion	2001 Threshold Evaluation Report
Visitor-days 2000	17 million	2001 Threshold Evaluation Report
Visitor Spending 2000	\$1.5 billion	2001 Threshold Evaluation Report
Direct and Indirect Visitor Generated Jobs	36,100	2001 Threshold Evaluation Report

2.2 Pathway 2007 Agencies

The Lake Tahoe Basin has a complex network of government institutions, special districts, nongovernmental organizations, coalitions and research institutions. This section briefly describes the mandates for each of the Pathway 2007 agencies and the governing documents being updated in the near term.

2.2.1 Tahoe Regional Planning Agency

TRPA is the regional planning and regulatory agency for the Lake Tahoe Region. TRPA has the role of planning, coordinating, and regulating projects within the Lake Tahoe Region. Its stated mission is “leading the cooperative effort to preserve, restore, and enhance the unique natural and human environment of the Lake Tahoe Region”. While TRPA establishes the minimum standards for local, state and federal agencies within the Lake Tahoe Region, it is neither a project implementing agency nor a land management agency. TRPA has no powers to own land or to tax. It depends on partners through out the Lake Tahoe Region to assist with the non-regulatory/planning functions needed for plan implementation.

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TRPA operates under the authority of the Tahoe Regional Planning Compact (Compact) approved in 1980 by the states of California and Nevada and the Federal Government. TRPA must adopt and develop Environmental Threshold Carrying Capacities and establish a Regional Plan to 1) achieve and maintain Thresholds, 2) meet State and Federal water and air standards, and 3) meet planning requirements as set forth in the Compact. The Compact states that the Threshold Standards are intended to represent environmental qualities necessary “to maintain significant scenic, recreational, educational, scientific or natural values of Lake Tahoe”. TRPA has established Threshold Standards for each of nine environmental categories: Water Quality, Air Quality, Scenic, Noise, Vegetation, Recreation, Wildlife, Fisheries, and Soils.

TRPA’s Regional Plan includes a Land Use Plan, a Transportation Plan, a Conservation Plan, a Public Service Plan, and a Recreation Plan. TRPA added an Implementation Element to direct the execution of the Regional Plan and the distribution of development allocations. The Regional Plan also includes regulating ordinances relating to zoning, development standards, and environmental protection. The organization of the Regional Plan and associated components are shown in Figure 2-1. Figure 2-2 shows a map of the region including TRPA plan areas.

The Environmental Impact Study for the 1987 Regional Plan analyzed development allocations for 20 years. Consequently, it is now necessary to update the plan.

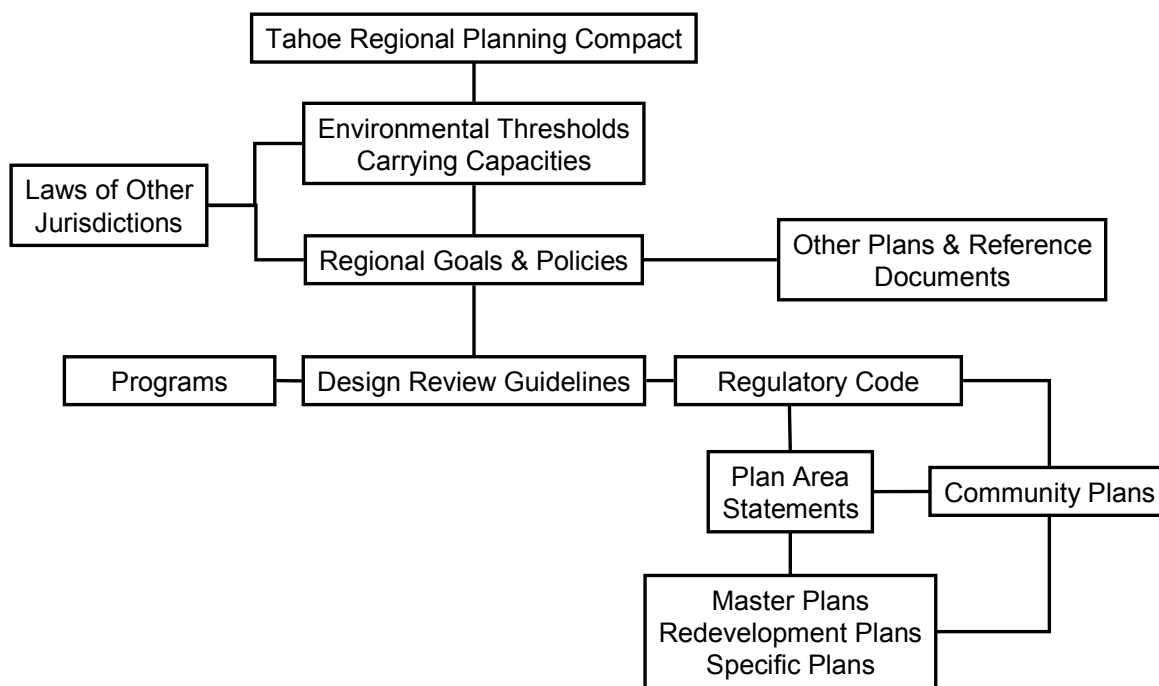


Figure 2-1. Schematic of TRPA Regional Plan Regulatory Framework

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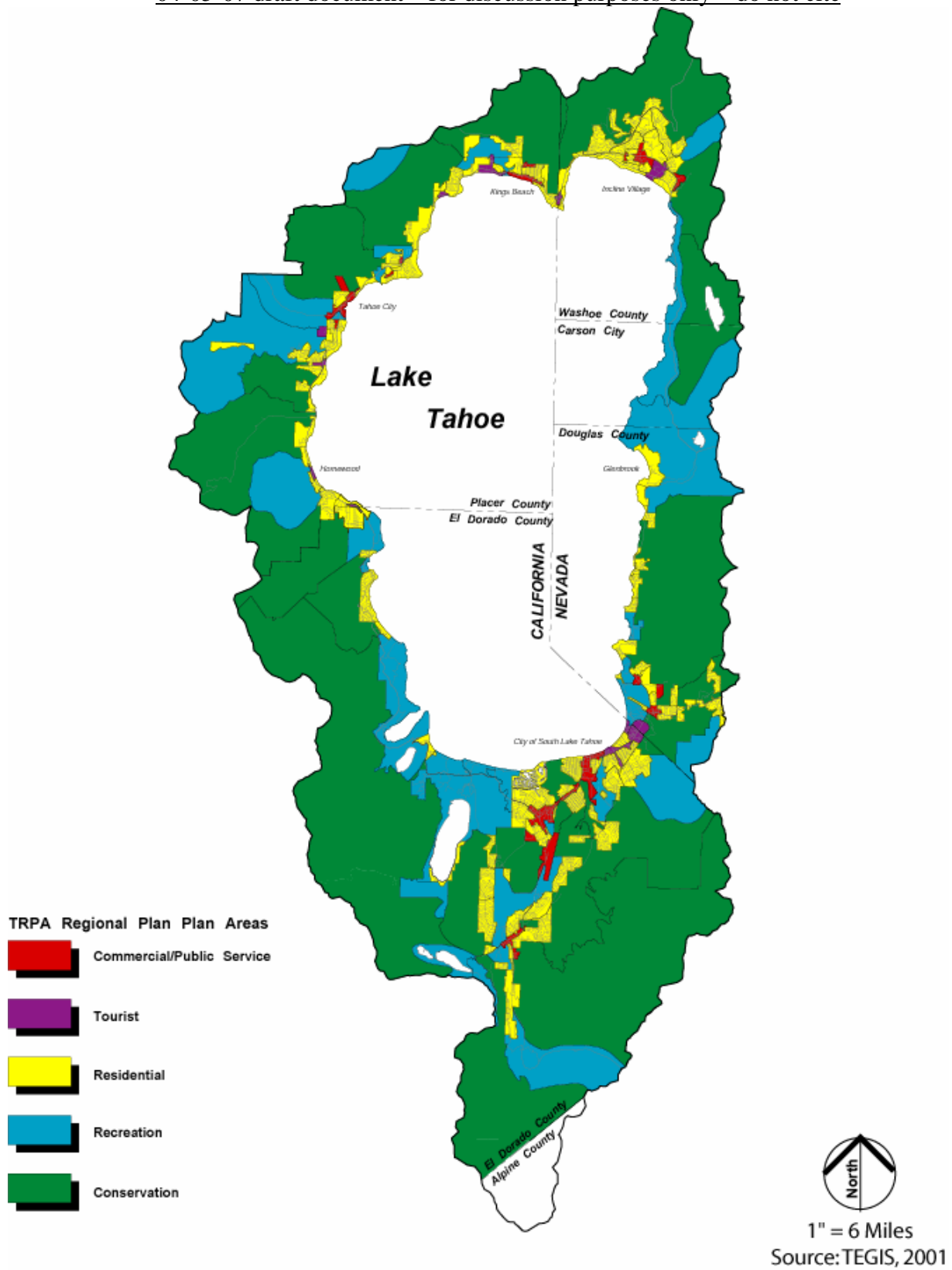


Figure 2-2. Map of the Lake Tahoe Region.

2.2.2 United States Forest Service, Lake Tahoe Basin Management Unit

The United States Department of Agriculture Forest Service (USFS), Lake Tahoe Basin Management Unit (LTBMU) manages approximately 80 percent of the land in the Lake Tahoe Basin. The 2005 Final Planning Rule for National Forest Management Act directs the USFS to develop a Land and Resource Management Plan (Forest Plan) according to a three part model.

- 1) **Vision** provides direction for management and describes the roles and contributions of National Forest System lands. Desired conditions are the Forest Plan's primary focus. They may be expressed for the entire Forest or for specific locations. Generally, the time horizon for achieving a desired condition is within 10 to 50 years, and they are expected to be achieved through the implementation of the Forest Plan. The Vision portion of the Forest Plan is developed collaboratively with the local community.
- 2) **Strategy** describes the suitable uses of land and the principal management strategies the plan will employ to reach the Vision. It conveys a sense of priorities among the objectives directing management emphasis. Program objectives describe high level activities that lead toward achieving desired conditions. Monitoring and evaluation activities are also outlined in the Strategy.
- 3) **Design Criteria** sets specific standards and specifications for projects. The design criteria can be either in this portion of the Forest Plan or may refer to other documents that provide direction and set standards for projects and certain types of activities.

This new Forest Plan model is designed to be adapted as needed, over time, rather than through large revision events. Each of the three parts of the Forest Plan may be updated independently or together. The expected revision cycles are: 10 to 20 years for the Vision; 5 to 10 years for the Design Criteria; and 3 to 5 years for the Strategy.

2.2.3 California Regional Water Quality Control Board, Lahontan Region, (Lahontan Water Board) & Nevada Division of Environmental Protection

Lake Tahoe is a federal and state designated Outstanding National Resource Water for its extraordinary clarity, purity and deep blue color. The Water Quality Control Plan for the Lahontan Region (Basin Plan) and the Nevada equivalent (Nevada Administrative Code) contain beneficial uses, water quality objectives, and implementation strategies for all water bodies in the Lake Tahoe Basin.

Beneficial uses are designated for each waterbody existing within each State, which are based upon current, historic and potential uses. Beneficial use categories are subject to slightly different terminology between the two states, however the uses remain largely consistent. Examples of beneficial uses include water supply, recreation involving contact with the water, and fisheries habitat. Specifically, Lake Tahoe is the only waterbody in Nevada that has been designated a water of extraordinary ecologic or aesthetic value. Similarly, California has designated Lake Tahoe an Outstanding National Resource Water (ONRW) for its extraordinary aesthetic quality and ecologic status.

Numerical objectives are developed for each water body according to 1) the levels of chemical constituents needed to protect the most sensitive beneficial use, or 2) historical water quality. In the Lake Tahoe Basin, most water quality objectives are set by historic water quality measured prior to 1975 for Lahontan Water Board. Water quality objectives may be reviewed and revised in California by the Lahontan Water Board. Similarly, the Nevada State Environmental Commission may adopt revisions in Nevada. In California, the State Water Resources Control Board, and the Office of Administrative Law must also approve changes in water quality standards. For both states, the U.S. Environmental Protection Agency must also review approve any changes to standards for surface waters.

2.3 The Evolution of Pathway 2007

In 2001, in recognition of the value of consistency in the Lake Tahoe Basin, the four Pathway agencies agreed to collaborate their efforts. Figure 2-3 illustrates the conceptual planning alignment for collaboration between the Pathway agencies and with other governmental entities and the public in developing common goals.

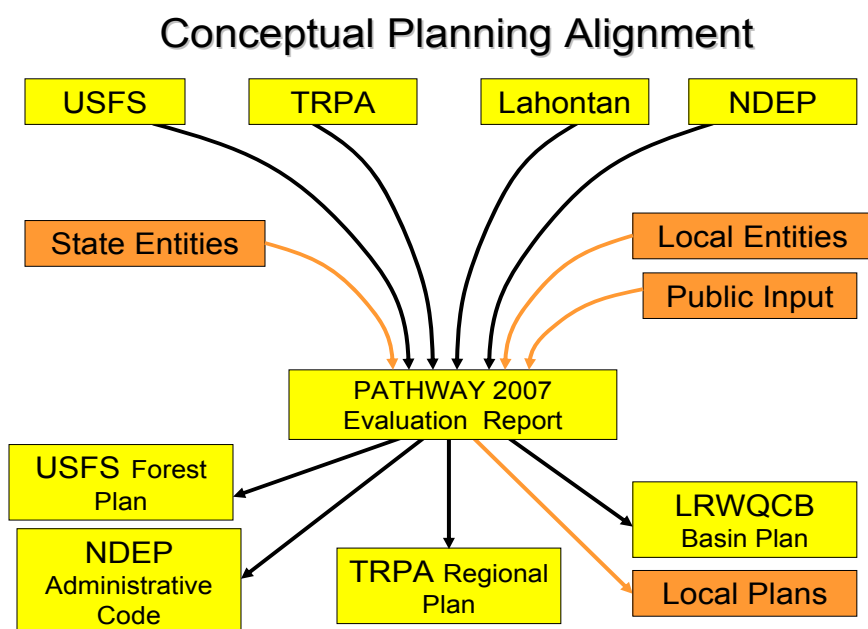


Figure 2-3. Pathway Agencies Conceptual Planning Alignment

Table 2-2 presents a summary of the steps outlined for the Pathway 2007 process.

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Table 2-2. Summary of stages for the Pathway 2007 process

Stage	Years	Description
1	2001-2004	Scientific research on issues identified in Watershed Assessment and 2001 Threshold Update Report.
2	2004-2006	Evaluate public and technical input, and agree upon Visions, Desired Conditions, Indicators and Standards.
3	2005-2007	Develop management strategies and agency specific planning documents. Develop the management system.
4	2007 +	Adoption and implementation of agency management plans and operation of management system.

The first stage of the Pathway 2007 process - between 2001 and 2004 - focused on research into issues identified in the *Lake Tahoe Watershed Assessment* and the *2001 Threshold Evaluation Report*² as well as the investigations associated with the Lake Tahoe Clarity TMDL. Over \$6 million in contract funds and thousands of agency staff hours were dedicated to this effort.

The second stage focused on the development of common visions, desired conditions, indicators and standards for the resources of the Lake Tahoe Basin. This report is a major milestone in the second stage of Pathway 2007. In general, report contributors relied on the best science as of the end of 2004 in developing this report. Ongoing investigations will inform further development of many indicators and standards. The end result of this stage is a set of recommended desired conditions, indicators and standards that will be used to guide development of management strategies and planning documents in the third and final stage of Pathway 2007.

The third stage of Pathway 2007 began in the fall of 2005 with the initial identification of potential management strategies. As discussed above, management strategies include land use, regulatory, and capital improvement and education program activities that fall under the Pathway 2007 agencies' jurisdiction.

During the third phase of the Pathway 2007 project, the management system is also being developed to coordinate monitoring and management efforts between the Pathway 2007 agencies.

The work begun through Pathway will continue past 2007 through the coordination of the individual agency planning requirements. Ongoing scientific investigations and a formalized policy review system will enable the Pathway 2007 agencies to improve the effectiveness of their management strategies and planning efforts.

² 2001 Threshold Evaluation Report, TRPA

2.4 Pathway 2007 Organization

Figure 2-4, illustrates a complex set of development and review committees that were formed to meet the needs of Pathway 2007. The makeup and intent of each of the groups are further described below. A list of the members of each group is provided in the acknowledgements of this report.

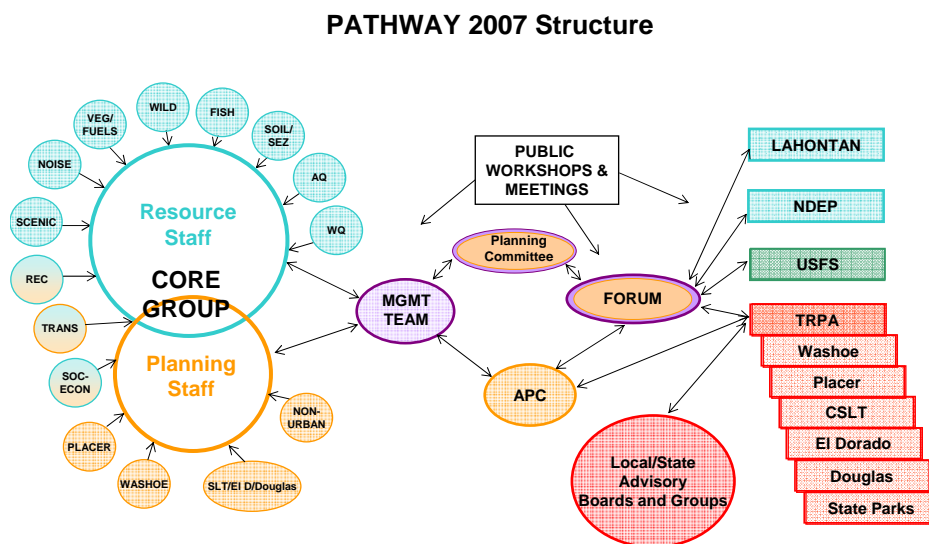


Figure 2-4. Pathway 2007 Collaboration and Development Structure

At left, resource and planning staff, contractors and advisors develop initial proposals. The management team coordinates the efforts between the four Pathway 2007 agencies and the public advisory committees, including the Pathway 2007 Forum and TRPA Advisory Planning Committee. At right, agency decision makers consider revised and updated management plans.

2.4.1 Resource Core Groups and Administrators

Each Resource Core Group consisted of three to seven Pathway 2007 agency staff and contractors with significant technical and/or practical experience in the resource area. The Resource Core Group investigated and recorded all aspects of the work related to the resource area. Each Resource Core Group and their associated Technical Working Group was led by an administrator.

2.4.2 Technical Working Groups

Each Resource Core Group solicited expert input from professionals in their resource area through a Technical Working Group (TWG). The TWGs involved over 100 volunteers and were intended to operate like “think tanks.” They provided an opportunity for broad, open and freethinking technical discourse to ensure complete exploration of technical issues. They also provided technical review of products produced by the Resource Core Group.

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The desired conditions, standards and indicators are related to policies. Therefore, it was inevitable that the TWGs touch upon policy and legal issues. However, the TWGs were not intended to give legal opinions or interpretations. In January 2005, TWG Visioning workshops provided TWG members with an open opportunity to provide input on the general visioning and direction for their respective resource areas. After that time, the TWG members were expected to focus their comments and review on technical issues and leave ideological interests outside of the TWG.

Figure 2-5 illustrates the relationship between the Pathway 2007 agency Resource Core Groups and their respective Technical Working Group advisors.

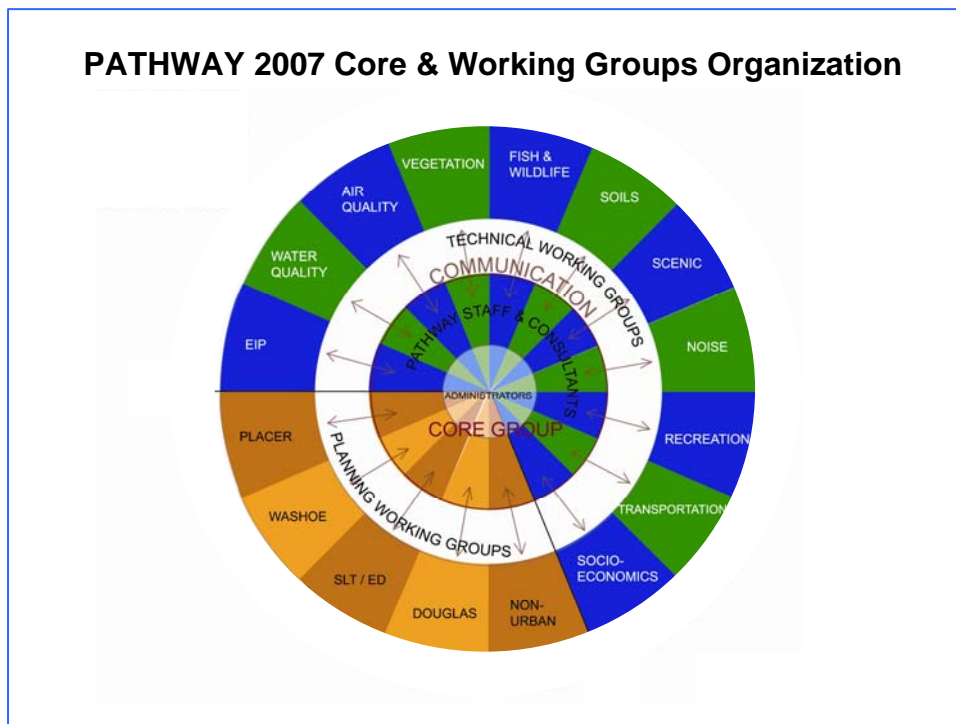


Figure 2-5. Pathway 2007 Organization: Core & Working Groups: Technical investigations are organized by resource areas (blue and green), and Community planning issues will be addressed through geographical delineation (brown and orange). Core Groups of Pathway 2007 agency staff and contractors develop materials with input and review from a Technical Working Group or Planning Working Group. Each resource area is coordinated and led by an Administrator.

2.4.3 Planning Working Groups

Planning Working Groups (TWGs) formed in the summer and fall of 2005 operate similarly to TWGs. Their members, however, will be planners and other representatives interested in the plans for the specific geographically defined communities identified in figure 2-5. They have addressed issues such as:

- Land Management
- Future Development
- Transferable Development Rights & Fees Programs

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- Land Use Type, Form & Location
- Housing
- Cultural & Historical Resources
- Public Service
- Natural Hazards
- Institutional Coordination
- Finance
- Energy Use

2.4.4 Management Team

The Pathway 2007 Management Team consists of the Executives and a senior management representative from each of the Pathway 2007 agencies. The Management Team addressed project design, project management and resource allocation issues between the four agencies. The Management Team provided the agency interface with the Pathway 2007 Forum and other advisory and decision making bodies. The Management Team members reviewed proposals and content for consistency with agency mandates, representing their agency perspective. Each of the Pathway 2007 agencies has a unique decision making body and process as described Section 2.2, above.

2.4.5 Pathway Forum

The Pathway Forum was established to provide for representation of the informed public within the Pathway 2007 process. The Pathway Forum was formed as the primary body for providing public input. The Pathway Forum is made up of individuals representing local, regional and national interests presented below.

- Local Interests
 - Transportation/ Transit
 - Real Estate - full time residents
 - Real Estate – seasonal residents
 - Labor
 - Community Business
 - Tourism Business
 - Community Sustainability
 - Environmental/ Conservation
 - Washoe Tribal Interests
 - Education K – 12
 - Education Post-12
 - Non-governmental Social Services
 - Community Recreation
 - Motorized Recreation
 - Non-Motorized Recreation
- North Tahoe
 - California Public Utility Districts
 - Nevada General Improvement Districts
 - At-Large
- South Tahoe
 - California Public Utility Districts
 - Nevada General Improvement Districts
 - At-Large

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- Nevada Interests
 - Washoe County
 - Douglas County
 - State Non-Regulatory Agencies
- California Interests
 - Placer County
 - El Dorado County
 - City of South Lake Tahoe
 - State Non-Regulatory Agencies
- Regional Interests
 - Community Business
- Environmental / Conservation
- Community Sustainability
- Built Environment
- Non-Governmental Social Services
- Transportation / Transit
- Recreation
- At Large
- National Interests
 - Recreation Providers
 - Environmental / Conservation
 - Non-Motorized Recreation
 - Motorized Recreation

The Pathway Forum roles are outlined in their the Charter found on the Pathway website (www.pathway2007.org).

2.5 Public Visioning and Issue Identification

Public outreach and collaboration has been a cornerstone of the Pathway 2007 process. Public input was gathered early in the Pathway process through several venues, including:

- Five general public visioning workshops were held in January 2005 - two within the Lake Tahoe Basin and others in Los Angeles, Las Vegas and San Francisco with a total of over 300 participants.
- Each Pathway Technical Working Group, the Pathway Forum and the TRPA Governing Board also participated in the visioning workshops;
- Eight focus groups were held between December of 2004 and February of 2005 engaging full and part-time residents of the Lake Tahoe Basin, and visitors from Las Vegas, Sacramento Suburbs (El Dorado Hills area residents), Foothills residents (Placerville area), Northern Nevada residents, Los Angeles residents and Bay Area residents; and
- A strategic telephone survey collected public opinion information from 1,800 individuals including 400 in-basin residents, 100 California in-basin land owners, 600 Nevada residents and 700 California residents.

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The following overarching themes were identified based upon the public input discussed above:

- The need for coordination among agencies, and use of flexible and pragmatic approaches to planning and regulation, including general agreement that regulations are too complex and difficult to understand;
- The need to prioritize implementation strategies and integrate thresholds;
- The need for more education regarding environmental issues and sources of environmental degradation; and
- A desire to create a sustainable community in the Lake Tahoe Basin.

The first two of these themes are central to the overall goal of the Pathway effort. The Pathway agencies and their public communications and education programs will continue to work together to improve public education on environmental and resource management issues. A desired condition for social communities is proposed within the socio-economic resource area.

The public input received specific to individual resource areas are contained within each resource area chapter. The highest priority issues identified by the public through visioning workshops and public opinion research were:

- **Forest Health & Reducing Wildfire Danger**
There is a need to reduce un-natural levels of hazardous fuels and forest densities that feed catastrophic wildfire. This will reduce risks to communities while enhancing forest health.
- **Transportation**
There is a need to resolve problems of traffic, parking and other auto related conditions, including the need for an improved transit system.
- **Water Clarity**
There is a need to maintain or improve Lake Tahoe water clarity.
- **Scenic Resources & Night Skies**
There is a need to protect views to and across Lake Tahoe . Concerns were raised regarding a conflict between development and views. There is also a need to protect clear night skies.
- **Wildlife and Native Fish Habitat**
There is a need to restore and maintain healthy and productive habitat for wildlife and native fish.

As the recommendations for resource management were developed through the Pathway 2007 process, the Pathway Forum was engaged to provide additional public input. Between September 2005 and March 2006, the Forum reviewed and made recommendations regarding proposed Visions, Desired Conditions, Indicators and Standards for each of the resource areas. The recommendations of the Forum are presented in the *Pathway 2007 Forum Report, April 2006*. While the Pathway Forum did not reach consensus on all of the recommended resource

parameters, all of the Pathway Forum input was considered by the Pathway agencies in the final recommendations presented in this report.

2.6 Planning Terms for the Pathway Process

In their respective planning processes, each of the Pathway 2007 agencies adopt narrative goal statements, measurable standards to assess attainment of the goal and planning and regulatory activities to achieve the standards. Each agency may use distinct terms for these parameters in accordance with their respective planning requirements. The Pathway 2007 program has established standard planning terms for the purpose of collaboration as follows:

Desired Condition

Desired Conditions describe the ecological, economic, physical, and social attributes that characterize or exemplify the outcomes of land management and, or land use regulations.

Desired conditions play a similar role for the USFS as value statements and goals play for TRPA and as beneficial uses play for Lahontan and NDEP. Desired conditions developed through Pathway 2007 will be adopted as narrative goal statements by each appropriate agency.

Indicator

A measurable parameter or an index of multiple measurable parameters used to track progress toward achieving a desired condition and/or standard. Indicators are measures that change in response to human activity and can be used to assess the quality of resource or experience conditions.

Standard

A numerical target related to an indicator that defines successful achievement of a desired condition. For purposes of this document the term standard does not imply that the numeric target is legally binding or enforceable.

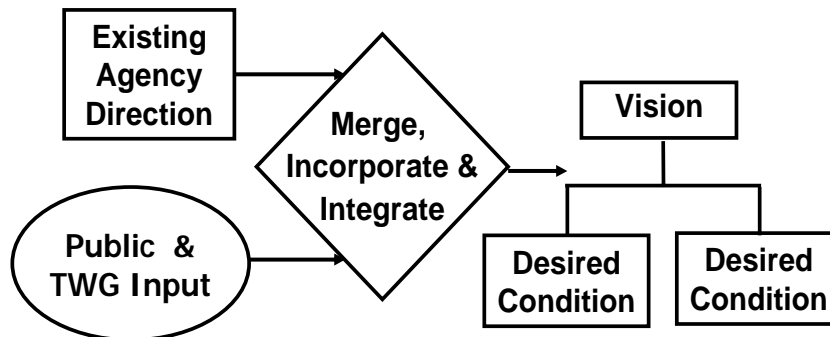
Standards establish the measurable goals for each of the Pathway 2007 agencies. Lahontan and NDEP must meet pollutant specific water quality objectives. TRPA must develop Threshold Standards that are legally binding. The USFS does not pass legally binding standards related to desired conditions, but they do monitor progress towards achieving the desired conditions.

2.7 Process for Developing Desired Conditions

One objective of Pathway 2007 has been to define environmental goals to direct the Pathway 2007 agencies' resource management efforts. The goals must be understood and supported by the public. These goals are presented as outcome-based desired conditions for each resource area.

Figure 2-6 illustrates the process of analyzing existing agency direction, and public and technical input, resulting in a proposed set of desired conditions consistent with an overarching resource area vision statement.

Figure 2-6. Desired Condition Development Process



The process for developing the proposed desired conditions has moved through several steps of information gathering and organization, resulting in desired conditions for each resource area. These stages proceeded as follows:

1) Public Visioning

Input was solicited from the public through visioning sessions and outreach (described above).

2) Technical Working Group Visioning

Input was gathered from each Technical Working Group, through facilitated visioning sessions.

3) Identify Existing Desired Conditions

Existing desired conditions or their equivalent that provide basin-wide direction were identified. The desired conditions were distinguished from management direction related to project level implementation.

4) Merge Existing Desired Condition Statements

Each of the Pathway 2007 agencies have management directions that may be stated differently but have similar intent. In order to understand how the management direction for the different agencies compares, existing desired conditions were organized in tables that aligned similar management direction across each agency. Any discrepancies between these desired conditions were evaluated and a common desired condition statement consistent with the intent of each of the Pathway 2007 agencies was developed.

5) Incorporate Public and TWG Input

The issues identified through public and TWG Visioning were compared to the merged set of existing desired conditions for each resource area. Input relating to existing desired conditions was added alongside the merged desired condition statement. Input that identified new issues was also included. A set of merged and incorporated desired conditions was produced for each resource area that reflects the current management direction as well as public and TWG input.

6) Organize and Rationalize

Many resource groups identified dozens of desired conditions through this process. In order to focus these desired conditions down to a manageable number that could be discussed and tracked, issues have been grouped into a hierarchy of related topics.

A three-tiered diagram was developed for each resource area to summarize:

- An overarching vision statement for the resource area::
- Desired condition statements that capture the most important general issues related to the resource area; and
- Attributes that describe the specific elements of each desired condition.

7) Integration between Resource Areas

To begin cross-resource area integration, the Resource Core Groups developed a matrix of links between resource areas. Through a series of facilitated and follow-up cross-resource area meetings, desired conditions from each resource area were analyzed with respect to the other resource areas. Few conflicts were identified at the desired condition level, though many interactions and potential conflicts at the management strategy and project level were identified. These interactions and potential conflicts will be evaluated further during the development of management strategies as the individual agency planning processes move forward.

2.8 Process for Developing Indicators And Standards

2.8.1 Technical Need for Change

To begin the development of the indicators and standards for each desired condition, the resource groups identified the need for change from current provisions. Scientific information in the *Lake Tahoe Watershed Assessment* and the completion of three Threshold Evaluations since 1987 indicated that approximately 55% of TRPA's threshold standards and indicators needed review and update prior to updating the Regional Plan. Findings include:

- Indicators that do not directly measure the status of the respective standard;
- Standards that are inherently unattainable as originally articulated;
- New indicators that are superior measures of environmental conditions; and/or
- Indicators that do not detect environmental change over a five-year evaluation period or even a 20-year planning horizon resulting in an inability to relate information to the associated standards.

2.8.2 Criteria for Changing Existing Indicators and Standards

All of the Pathway agencies are required to comply with the most restrictive federal and state laws, requiring a legal need for change when laws become more restrictive. When adopting ETCC standards in Resolution No. 82-11 the TRPA Governing Board also specified that scientific and technical information indicate one of the following criteria are met before changing ETCC standards:

- Two or more standards are mutually exclusive; or

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- Substantial evidence to provide a basis for a standard does not exist; or
- A standard cannot be achieved; or
- A standard is not sufficient to maintain a significant value of the region or additional threshold standards are required to maintain a significant value.

In order to require changes in the existing USFS indicator and standard system a “significance test” must demonstrate a need for change in accordance with the following criteria:

- There is a driving public concern or issue to make a change;
- The necessary resources are available to make the change; and/or
- A new or better system is readily available for use.

In some instances current monitoring practices are technically more robust than the standard it relates to. In these instances, adjusting the standard to conform to the units of the monitoring program may be appropriate.

2.8.3 Indicator Development Process

The Pathway indicator development process builds upon the results of the adaptive management framework. The process is informed by members of the Management System Core Group to guide the development of indicators that will work within the management system. The process followed the following steps:

1) Potential Indicators for Desired Conditions and Attributes

The first step for determining desired conditions and attributes was to develop a broad set of potential indicators that could potentially be used to evaluate the condition and trend related to the desired condition.

2) Screening and Evaluating Indicators

The next step involved screening and evaluating this comprehensive list of indicators to find the most useful indicators. This process employed a set of four necessary criteria which must be met for the indicator to be considered viable. Viable indicators were further evaluated using a set of nine desirable criteria with some groups adding additional criteria appropriate for their resource area. The criteria employed are listed in Figure 2-7.

3) Integration of Indicators

After completion of the initial indicator evaluation each resource area TWG discussed potential overlap with other resource areas. These discussions often resulted in some revisions to the previously discussed desired conditions as well as groups developing a better understanding of the interactions between resource areas. More indicator integration work continues with the development of a basin-wide monitoring system. This monitoring system is an integral element of the overall Management System.

Necessary Criteria
The indicator is measurable in a meaningful fashion. The indicator must be statistically defensible. The indicator must be related to the environmental goal, desired condition or attribute. The indicator must be understandable by and meaningful to environmental managers, basin decision makers or basin stakeholders.
Desirable Criteria
The indicator can be measured cost effectively. The analysis for the indicator is cost effective. There is institutional capability and capacity for long-term measurement of the indicator. There is institutional commitment to utilize the indicator. The indicator can be used for predictive purposes. The indicator can act as an early warning alert for managers. The indicator may have linkages with multiple environmental goals. There is risk associated with not measuring this indicator. There are no known limiting factors for the indicator.

Figure 2-7. Necessary and desirable criteria used to evaluate indicators

2.8.4 Indexes and Indicator Suites

An index is a type of indicator derived from a set of aggregated or weighted measures. An indicator suite is a group of indicators that collectively present information on a major environmental issue, such as human health. An index or indicator suite is used when a single type of measurement does not accurately portray the information needed to understand the overall condition of concern. In this report the term index is used for both index and indicator suite.

The Consumer Price Index (CPI) is commonly reported in the media. The CPI is a measure of the change in the cost of a “fixed” basket of products and services, including housing, electricity, food, and transportation. This fixed basket is periodically updated to adjust to the evolution of products and services consumed in order by most Americans to represent the change in cost of living.

Several indexes are proposed to represent desired conditions in this report. To be useful an index must be based on the appropriate measurements and must define a clear set of rules that will be used to interpret the various measurements in to a single reportable outcome.

2.8.5 Standards Development Process

Standards were developed for each resource area based upon the desired conditions, legal constraints, recent scientific information, technical feasibility and input from the public and proposed measurable standards. These proposed standards are presented in each resource area chapter along with the proposed desired condition.

2.8.6 Classifying the Level of Development of Indicators and Standards

Many new technical needs have been identified through the investigation of desired conditions and analysis of indicators and standards. As a result, the indicators and standards proposed in this report are at varying levels of development. Some have historic data sets and well developed protocols while others must be further investigated and tested. Each indicator and its associated standard are classified by the level of development according to the following definitions.

Type I - The indicator directly represents the condition with respect to the desired condition, has well established monitoring and analysis protocols and a historic dataset to show current condition. A measurable standard can be directly linked to the desired condition without further investigation.

Type II - The indicator directly represents the condition with respect to the desired condition; monitoring and analysis protocols are established with minor adjustments potentially necessary; baseline or background information may be needed to establish a numeric level for current conditions. A measurable standard will directly link to the desired condition; however some additional investigation may be required to determine the appropriate measurable standard.

Type III - The indicator is expected to represent the condition with respect to the desired condition; monitoring and analysis protocols and specific parameters may still require further investigation to develop the indicator; baseline data may need to be collected to establish a numeric level for current conditions. Further analysis is required to develop a measurable standard that will directly link to the desired condition.

For each Type II (two) and III (three) indicator a basic work plan is presented that outlines the steps required to further test and refine the indicator. Many of these investigations will be completed before the Pathway agencies' management plans will be adopted. Indicators and standards updated outside of the Pathway 2007 timeframe will be incorporated through a process that will be developed as part of the management system. In the interim the Pathway 2007 agencies will determine if existing standards should be used - when available - or if establishing indicators and standards should be delayed until scientific investigations are complete.

2.9 Future Development of Management Strategies

Programmatic, policy, capital improvement and regulatory management strategies will be developed to achieve the desired conditions and to meet the recommended standards. This report does not address the management strategies. Management strategies and their related management indicators will be set forth in the Regional Plan, Forest Plan and the Basin Plan.. The Pathway program will continue past 2007 to ensure consistency between the Pathway agencies as their individual plans are developed.

2.10 Management Systems

Each agency must review progress towards meeting the goals and adjust their plans and management strategies accordingly. The management system that will be developed through Pathway will coordinate responsibilities for collecting and analyzing information. It will also establish protocols for adapting management strategies and planning documents to respond to information regarding resource condition and management effectiveness. The management system is discussed further in Chapter 3.