

BISHOP PEAK NATURAL RESERVE CONSERVATION PLAN UPDATE

A Master's Project

Presented to

the Faculty of California Polytechnic State University,

San Luis Obispo

In Partial Fulfillment

of the Requirements for the Degree

Master of City and Regional Planning

by

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June 2011

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## ABSTRACT

### Bishop Peak Natural Reserve Conservation Plan Update

Douglas J. Bush

My master's project is updating the Conservation Plan for the Bishop Peak Natural Reserve (BPNR) in San Luis Obispo, California. It is a professional project for the City of San Luis Obispo, supported by City policy that requires continued management of its open space network through management plans unique to each property. As one of the city's most visited open spaces and one of its most visible natural landmarks, the Bishop Peak Natural Reserve is in need of continued management and oversight. While much of the work in developing the plan focused on identifying issues and developing responsive policy, this background report takes a step back, focusing on the underlying principles and municipal policies which direct those efforts. This paper serves as a background report for the planning process including an overview of methodology and policy development. One of the primary goals set forth in the BPNR update process is to improve of management capacity and increase the potential for successful implementation. To accomplish this, the reports shows how aspects of an Adaptive Management approach can be integrated into plan review and development. This background report is intended to complement the plan itself and therefore issues not covered within this report are covered within the plan.

## ACKNOWLEDGMENTS

Thank you firstly to Elena Meza. Your love, humor and passion for life inspires me to no end.

Thank you to Kelly Main, Bob Hill and Chris Clark for your time, your advice and your patience. Thank you to my friends and family for your support. Lastly, thank you to the many teachers I've had from preschool to college who believed in me even when I didn't.

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## INTRODUCTION

The City of San Luis Obispo is located at the heart of California's Central Coast, half way between the major metropolitan centers of San Francisco and Los Angeles. The city is known for its scenic natural setting and most notably the chain of volcanic peaks that stretch north from the southern end of the city, terminating at the Pacific Ocean. Among these peaks, Bishop Peak is the highest and receives the largest number of visitors throughout the year. At roughly 352 acres, the Bishop Peak Natural Reserve (BPNR) is home to this distinctive natural feature and is one of eleven recognized open spaces that comprise approximately 7000 of open space land managed by the City. The Natural Resources Protection Program is responsible for developing unique management plans for each of these spaces and the 2015 update of the Bishop Peak Natural Reserve Conservation Plan sets out the plan by which the reserve will be managed.

The reserve encompasses the entirety of Bishop Peak's summits in addition to the eastern half of its alluvial apron and comprises three separate properties. The title of "natural reserve" is used to differentiate open spaces like BPNR where one or more contiguous open space lands reflecting differing types of acquisition are assembled as a contiguous parcels. (Ord. 1332 § 1 (part), 1998). These properties were acquired under different conditions but all three are collectively managed as the Bishop Peak Natural Reserve. The peak at the center of the reserve has been documented as a significant local landmark since Spanish missionaries first laid eyes on it. Seeing the resemblance of the peak's twin summits to a bishop's three pointed hat, the missionaries gave the peak its name. Famous California figures such as John Muir and William Brewer also wrote of the peak in their travels. In April of 1860, the party of surveyors, botanists and other scientists

conducting California's first Geological Survey arrived in San Luis Obispo. Upon arrival, botanist William H. Brewer wrote,

"San Luis Obispo town lies in a beautiful, green, grassy valley, about nine miles from the sea... A range of hills lies to the south, separating it from the sea in that direction.

Through this plain rise many sharp peaks or "buttes" - rocky, conical, very steep hills, from a few feet to two thousand feet, mostly of volcanic origin, directly or indirectly.

These buttes are a peculiar feature, their sharp, rugged outlines standing so clear against the sky, their sides sloping from thirty to fifty degrees, often with an average slope of forty to forty-five degrees! One near camp is beautifully rounded, about eight or nine hundred feet high, and perfectly green- scarcely a rock mars its beauty, yet the rock comes to the surface in many places. A string of these buttes, more than twenty in number, some almost as sharp as a steeple, extend in a line northwest to the sea..."

(Brewer, 1883 (pg 83.)

Open space is a valued component of the local geography and the local identity as well. A testament to this is the proliferation of local businesses borrowing imagery of Bishop's Peak and the other volcanic peaks known locally as the Nine Sisters. The peak can be seen on wine labels, real estate signs, in local commercials, guidebooks and magazines as well as the websites of the city and the local university. Furthermore, in 2015 as in many years past, acquisition, protection and enhancement of open space has been recognized as a major city goal by the City Council. City open spaces like Bishop Peak Natural Reserve collectively receive hundreds of thousands of visitors a year, a majority of which are local residents (Riggs, 2015). One testament to the local value of open space is the presence of a distinct Natural Resources Program in the city- a rarity for a town of this size (R. Hill, personal communication, November, 2015). The City's General

Plan Chapter 6 Section 8.2 articulates these values, by calling for preservation of open space surrounding and within the city boundaries (SLO, 2006). Through the development of Conservation Plans, the city translates these community values into policies and tasks that guide the future of the city's open space areas.

## CONSERVATION PLANS

As required by the Conservation and Open Space Element within the General Plan, the city must create and maintain a conservation plan for each of the open spaces within its ownership. While the BPNR area is managed jointly by the city and the county, it is primarily the responsibility of the city's Natural Resources Program to develop the plan for the reserve. The plan is required to achieve the overarching mission of the program, to protect natural resources present on the reserve including sensitive plant and animal species, while also providing for public access and recreation opportunities where compatible with this mission.

A plan was developed in 2004 to manage the BPNR but in the decade since, pressures on the reserve have changed, necessitating comprehensive adaptation. Weather patterns are changing, bringing greater risk of fire and creating new demands on vegetation management practices. Public usage has increased and the nature of the public's use has changed as well. The trail network is under great stress, creating potential problems for habitat conservation and public enjoyment. The growing popularity of the reserve and the lack of any official parking has also created tensions between those living near trailheads and those seeking access. These and other persisting challenges necessitate revisions of the current plan to ensure greater protection of natural resources and facilitation of high quality, low impact public use. An update of the conservation plan highlights the difficulty of planning for a dynamic area, characterized by high

levels of uncertainty. To address these challenges and expand planning and management capacity, principles of Adaptive Management (AM) were incorporated wherever possible.

This background report highlights my approach to the planning process and has provided an opportunity to broaden my knowledge in pursuit of an improved plan. This report covers a review of literature, providing a theoretical framework that guides the analysis, and a logical discussion of methodology and other components essential to plan development. The primary product of this professional project is a completed Conservation Plan for Bishop Peak Natural Reserve. The plan lays the groundwork for appropriate management of the area, balancing the needs of plants and animals with the recreational, aesthetic and environmental service value that the space provides. The plan has been presented to the Planning Commission, Parks and Recreation Commission and City Council for adoption.

#### JUSTIFICATION AND RELEVANCE TO PLANNING

Conservation Plans must be developed in accordance with the principles of the General Plan and should follow the requirements of the Conservation Guidelines for Open Space Lands. The following section highlights relevant goals, objectives and policies that guide the development of the plan. The City of San Luis Obispo maintains a management policy for each of its open space areas as detailed in Section 8, program 8.5.6 and 8.7.1E of the Conservation and Open Space Element (COSE).

##### 8.5.6 Determination of appropriate uses for City-owned open space.

Determination of the appropriate land management practices and the recreational uses of City-owned open space lands shall be made on an area-specific basis, based upon the policies in the Conservation and Open Space Element, the Open Space Ordinance

(SLOMC 12.22), and the adopted “Conservation Guidelines for City-Owned Open Space Lands.” These policies will be applied through the public planning and review process specified in the Conservation Guidelines, and will guide the preparation and adoption of conservation plans for City-owned open space properties.

8.7.1E The city must protect open resources by... managing its open space holdings and enforcing its open space easements, consistent with General Plan goals and policies and the Open Space Ordinance.

In Appendix C, the City further clarifies the purpose of the conservation plan. In this section, entitled "Management of Open Space Lands,"

"The City will adopt conservation plans (or master plans with conservation components) for large parcels, and for small parcels where conservation challenges and solutions need to be clarified. The preparation and adoption process shall foster participation by resource-protection experts and by the public. On lands designated Park (such as Laguna Lake, Mission Plaza, and Meadow Park), the plans will provide for previously established recreational uses. They may provide for passive recreational uses that do not adversely impact listed species and that minimize adverse impacts on other wildlife resources."(SLO, 2002, pg. 2)

The City has established conservation as a top priority in its planning efforts and open space is ground zero for these efforts. As stated in the 2006 COSE, open space has a close relationship with the desirability of San Luis Obispo as a place to live, visit and do business as well as with the scenic character of the community and the health of the environment (p. 6-43). The relevance of this project to planning is inextricably tied to the value of these preservation and management efforts and their prevalence in the planning process at all scales within the region. The BPNR

update is intended to be adopted by the San Luis Obispo City Council and will satisfy the goals established in the Conservation Guidelines for Open Space Lands of the City of San Luis Obispo (SLO, 2002). The overall purpose of the conservation plan is as follows:

1. to provide an account of the prevailing condition of a property
2. to set out future goals for the property
3. to prescribe a means of achieving those goals

An update of the BPNR is necessary to meet these goals due to the persistence of past issues and the rise of new challenges. The plan confronts a number of emerging issues and challenges including but not limited to:

- Access and parking issues related to availability of parking, proximity of trailheads to residences, roadway dangers
- Trail management including maintenance, routing and erosion control
- Habitat degradation, improvement, preservation
- Grazing, including grazing rights, habitat protection, streambed erosion, human animal interaction
- Impacts of rock climbing and related uses
- Waste management relating to pets, trash and other human waste
- Fire abatement, urban interface improvement, vegetation management and safety zones
- Interagency collaboration, shared management strategies

The conservation plan update provides an up to date account of the conditions of the property, assesses the performance of the previous plan, sets out future goals and prescribes a means of

achieving these goals for the coming decade, thus providing a valuable contribution to city planning efforts.

## FRAMEWORK

The City of San Luis Obispo is relatively unique in terms of the amount of open space that it has secured in and around the city as well as the extent to which it has established goals, objectives, policies, guidelines and other regulatory documents concerning the acquisition and management of such spaces (R. Hill, personal communication, November, 2014) To structure the approach to managing open space, each reserve has been divided into various land use designations that help define how the property will be managed. This approach is based on an understanding of the multiplicity of open spaces, their relevance to diverse stakeholders and their value in terms of recreation, habitat conservation, agricultural land preservation, flood and erosion protection and growth management. These varying uses fit under the following land use designations:

1. Habitat Area - land on which the primary objective will be to protect natural resources essential to the continued existence of native plants and resident and migratory wildlife
2. Management area/ trail corridor - lands that have the potential to support low levels of recreational pressure or animal grazing; or those areas that may be impacted by adjacent land uses. Active management of land in these areas will be required to facilitate approved activities while protecting valuable natural resources.
3. Restoration Area - land on which restoration and enhancement of plant and animal habitats will be pursued in an effort to restore damaged or impacted natural resources.

4. Cultural/Historic Area- Land managed to preserve and/or enhance cultural or historic resources on the site and provide for their interpretation. Restorative measure may be implemented if necessary.
5. Agricultural Area - Land that will be managed for the production of row crops or forage in a manner consistent with the protection and preservation of natural resources represented on the site. (SLO, 2002, p. 7-10)

Each of these designations sets a path by which the property will be managed with implications for vegetation management, human activities and impacts, wildlife protection, etc. Bishop Peak Natural Reserve has been split into three designations based upon a previous inventory of site conditions. These designations include Restoration Area, Management Area, and Habitat Area. As a response to updated assessments of reserve management and reserve conditions, these categories may change over time and in the case of Restoration Areas, *should* graduate to a preferred designation. (SLOMC, 12.22.020) In the 2015 plan update, the proportion of these designations have changed as a response to field inventories.



## METHODOLOGY

The Conservation Guidelines for San Luis Obispo Open Space Lands recommends that plans are updated periodically to, "report on progress, make adjustments, and include any proposals for new actions" (p. 22). Using this directive as the impetus for a plan update, several questions were posed. The first questions are chiefly related to the focus of the plan while the final question concerns process improvements:

1. How has the property changed since plan implementation?
2. What is the status of previously identified management concerns?
3. Which implementation measures have been applied and what responses can be identified?
4. Are there new or emerging issues on the property?
5. Can management be improved and if so how?

Due to the complexity of these questions and of the reserve itself, multiple methods were used (Yin, 2013). The following methodology was essential to assessing current conditions and developing policies and tasks in response to these conditions. The first phase was to generate empirical data through on-the-ground visits, photo monitoring, and environmental and biological surveys. The second phase of the process involved consultation with the public as well as city and county staff to solicit feedback from those with direct relationships with the reserve. This phase also involved a review of literature relating to AM processes in natural resource management to seek opportunities for process improvements. The following will be discussed in greater detail in the Applied Adaptive Management section:

1. *Existing Conditions Analysis / Inventory*

- i. *Environmental review including biologic inventory concerning wildlife, vegetation, habitat, rare and endangered species done for the purposes of this project as well as previous relevant inventories*
  - ii. *GIS data from city, county and state to identify biological and soils data, fire safety areas, trails, access roads, land ownership and easements*
  - iii. *Existing conservation plans within the San Luis Obispo open space network*
  - iv. *Site visits provide on-the-ground observations that contextualize other data concerning site assessment and policy development*
  - v. *Updating photo monitoring process and satellite imagery comparison to assess changes over time*
2. *Public Consultation*
- i. *A public participation plan was developed to identify opportunities for public involvement to help inform and direct the considerations of the plan.*
  - ii. *The plan will included the following components*
    - i. *Establishing Goals*
    - ii. *Stakeholder Identification*
    - iii. *Outreach Methods*
    - iv. *Where and When*
    - v. *Outreach Questions*
    - vi. *Community Partnerships*
3. *Staff Consultation*
- i. *Consultation with Natural Resource Department staff biologist Freddy Otte to assist in interpretation and integration of environmental inventory within plan development*
  - ii. *Meeting with fire officials (CalFire, City Fire) to discuss fire management needs, fire safety zones and vegetation management*
  - iii. *Meeting with Parks and Recreation Department and park rangers to discuss issues regarding public uses and related impacts*
  - iv. *Meet with City Transportation Engineering to discuss parking improvements and traffic controls*
4. *Literature Review*
5. *While background research was used to facilitate general policy development, the literature review included in the background report focuses specifically on opportunities for process improvements. Adaptive Management is explored as one potential approach to improving management capacity.*

Initial assessments of current conditions were achieved through site visits at various trailheads throughout the planning timeline. These visits provided an opportunity to assess the conditions of

the reserve through first-hand use. As a regular visitor to the reserve, I sought to first understand the current conditions through purposeful immersion as both recreator and planner. Some visits were further enhanced by on-site discussions with the Natural Resources Manager regarding the history of the preserve and current management issues while walking the trails. Discussing and assessing current conditions while visiting the preserve helped to avoid viewing the project area in abstraction. Information gained through site visits was later incorporated into policy development and helped later discussions with both the public and parties responsible for management.

Site visits also provide the opportunity to log spatial data, noting the location of areas of interest and plotting them using a Geographic Information System (GIS). By initially plotting these areas using free mobile phone applications such as Google MyTracks™ and Google MyMap™ the files could be easily shared between project collaborators as necessary. These maps provided helpful visual aids in discussions and public workshops and helped to determine the segmentation of issues in the policy development stage. Through the use of GIS it became clear that some issues were specific to particular locations while others were less geographically specific and had broader implications.

While use of Geographic Information Systems provided useful visual tools, photographs also played an important role in logging issues, assessing changes, and communicating challenges throughout the process. Photographs were taken on all site visits to build a visual database for reference during policy development. Special attention was paid to areas identified as "photo monitoring points," in the previous plan. These ten points were identified with both a description of their location and geographic coordinates. A decade since the previous photos were taken, each location was revisited and photographed to serve as a temporal comparison. These

photographs were then compiled in an appendix, side by side, to contribute to an ongoing record of the evolution of the space and the successes or failures of management practices and were also used as visual aids in public presentations.

In each of these steps, the goal was to assess the existing conditions of the reserve in respect to the management objectives outlined in the City's Conservation and Open Space Guidelines.

These guidelines vary based on the land use designations of the parcel. The BPNR is made up of multiple properties, each of which has its own management priorities and thus differing criteria by which it should be judged. The reserve is comprised of three separate land use designations: Habitat (64%), Management/Trail Corridor: (30%), Restoration (6%). Habitat areas are those which will not be heavily impacted by human activity, the primary purpose of which is to protect natural resources, "essential to the continued well-being of resident native plants and wildlife." The ultimate goal and thus ultimate criteria for evaluation of this space is the establishment of "a fully functional self-sustaining ecosystem" (SLO, 2002, p. 8)

The area falling under the Management/Trail Corridor is designated as such when a space is recognized as having the potential to support passive recreation. These areas will be, "kept to a minimum, and efforts will be made to reduce the impacts of human interaction on the habitat and natural resource value of the open space." These areas are then assessed for their recreational qualities as well as their impact on adjacent natural resources. The guidelines acknowledge that recreation and natural resource preservation are often overlapping or conflicting goals however the spaces should minimize the level of human impact and determine how much impact is acceptable. (SLO, 2002)

The last category which applies to the reserve is the Restoration Area. This designation applies to areas identified as degraded and in need of improvement and is ideally applied as a temporary

designation. Areas with this designation are often improved through planting of native species, re-grading to prevent erosion and use of fencing to reduce physical impacts. Areas with these designations are required by the Guidelines to have a "restoration blueprint" that make up an element of the Conservation Plan. Recent site visits indicated a number of new areas with the potential for the restoration designation and thus restoration blueprints will be developed for these areas.

## LITERATURE REVIEW: THE ADAPTIVE MANAGEMENT APPROACH

Until recent years, the City's Natural Resource Department has focused largely on acquisition of open space (R. Hill, personal interview, Spring, 2015). This is due in part to the environmental and aesthetic values of the community and the program's commitment to responding to these goals through land conservation and the creation of a greenbelt (SLO, 2006, p. 6-43). Each of the properties incorporated into the greenbelt, either through fee simple ownership, easement, or other mechanisms, require some degree of management by the city. In 1994, Natural Resources Manager Dr. Neil Havlik acknowledged this need when he wrote, "the amount and variety of property now in ownership requires that the City systematically plan for the long-term stewardship of these areas" (SLO, 2002, p. 5) Today as the greenbelt nears completion, the City is transitioning further from acquisition to management. With thousands of acres of open space under city control, emphasis on quality conservation plans is growing (K. Lichtig, personal communication, Spring, 2015). One of the primary goals set forth in the BPNR update process is to improve of management capacity and increase the potential for successful implementation. As the program makes its transition away from acquisition and toward management, Adaptive Management has been identified as a method of particular interest (R. Hill, personal communication, November, 2015). The following section looks at the principles of AM, how it works, when it can be applied and ultimately whether it may appropriate in the context of the BPNR Conservation Plan Update.

The purpose of a conservation plan, according to the original *Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*, is to "provide information and recommendations on: the prevailing conditions of the property, future goals for the property and prescribed means of achieving stewardship goals" (SLO, 2002). These guidelines and the methods established

therein, have been used to guide the first iterations of conservation plans for open spaces throughout the city from the mid 1990s. Most plans were created with a 7-10 year time horizon and are now over a decade old. As these plans begin to age they will be revisited and revised. In the process of updating the plan for BPNR, it has become clear that while the original guidelines were appropriate for the needs of the time, there is now a necessity for reexamining the way plans are written and updated. While the original guidelines are still in place, new guidelines may be developed in the coming year and this section may serve to inform those guidelines as well as the current BPNR update.

#### WHAT IS ADAPTIVE MANAGEMENT?

As city open spaces begin to age, new management challenges emerge, many of which were not anticipated at the outset. The Conservation Guidelines as they are currently written, focus on the development of new plans, but focus very little on the unique challenges of updating previous plans. Even so, they do hint at the potential for these challenges by calling for several forward thinking measures. Firstly they suggest using ongoing monitoring primarily through photomonitoring points- taking photographs at consistent locations over time to visualize changes. They also suggest an implementation strategy focusing on specific goals, timelines for implementation and revisiting the plan every 5-7 years to "report on progress, make adjustments, and include any proposals for new actions" (SLO, 2002, p. 22). While these guidelines touch on very important points, they represent a very small portion of the guidelines written in 2002. Many years later it is clear that these recommendations deserve a much greater emphasis. Today these points represent an opportunity to improve effective management through more explicit adherence to principles of what is now known as "Adaptive Management."

A common underlying issue facing planners in natural resource management as well as broader city and regional planning fields, is the uncertainty surrounding both cause and effect. Cause being the reason that issues have come about, why they have persisted, or why they haven't responded to intervention. Similar to the uncertainties of cause, planners often struggle with the ability to predict outcomes of their actions. Planners respond to these uncertainties in a multitude of different ways. AM is unique among them because it responds to significant uncertainty head on, making reduction of uncertainties a primary goal of the planning process (Lee, 1993).

As stated in his often cited book, *Compass and Gyroscope: Integrating Science and Politics for the Environment*, Kai Lee (1993) writes, "adaptive management is an approach to natural resource policy that embodies a simple imperative: policies are experiments; learn from them. In order to live, we use the resources of the world, but we do not understand nature well enough to know how to live harmoniously within environmental limits." (p. 9) Some traditional planning philosophies, such as rational planning and strategic planning- "produce what are viewed to be *correct* decisions wherein the 'policy's implementation is a minor exercise.' Implementation is viewed as an end unto itself thus representing the termination of a planning process." (Boswell, 2000, p. 3) This again is where Adaptive Management signifies a departure. Rather than seeing the planning process as a linear trajectory from problem to solution, it suggests that in situations with limited institutional experience or great contextual dynamism, planners should see the process and the lessons learned as end goals in themselves.

The Adaptive Management Technical Guide from the US Department of the Interior is one of the most comprehensive guides for utilizing Adaptive Management in the context of environmental and natural resource planning. As suggested in the guide, adaptive management may defined as, "an approach that promotes flexible decision making that can be adjusted in the face of



uncertainties as outcomes from management actions and other events become better understood," and "careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process." (Williams, et al, 2009, p. V) In the case of the Bishop Peak Natural Reserve, this idea is especially applicable and can provide guidance for the update process.

Lee explains the characteristics of this iterative process of moving between knowledge and action by saying,

"[Practitioners of adaptive management] are explicit about what they expect, so that they can design methods and apparatus to make measurements. Second, they collect and analyze information so that expectations can be compared with actuality. Finally, they transform comparison into learning- they correct errors, improve their imperfect understanding, and change action and plans." (Lee, 1993, p. 9)

In practice adaptive management can take the form of three typical approaches categorized by Walters and Holling (1990): evolutionary, passive adaptive and active adaptive. These approaches differ based upon the degree and quality of background data that is available.

Evolutionary or 'Trial and error' is the most basic approach, often used where limited historical data is available. This minimally structured approach begins with the most basic and unifying step of formulating or defining the resource problem but unlike more advanced approaches, it forgoes complex forecasting such as the development of models to inform alternatives selection. Because of this it may be perceived as "haphazard" (Boswell, 2000, p. 2). With this approach, over time initial experiments will yield results that can be built upon in a progressive, evolutionary manner. This approach has the potential to produce positive results but under a longer time horizon than approaches informed by more data-rich models.

According to the DOI Technical Guide (Williams, 2009) more mature adaptive management "develops conceptual models based on specific assumptions about the structure and function of the resource system and identifying actions that might be used to resolve the problem" (p. 9) Where historical data is more widely available, these models can be developed to assist in development of policy alternatives. The "passive adaptive" and "active adaptive" approaches identified by Walters and Holling more closely follow a scientific method by utilizing modeling as well as the identification of key variables and hypothesized relationships to inform the process and inform future reassessment of implementation actions.

#### CONDITIONS FOR APPLICATION

According to Williams (2009), there are two primary conditions that may warrant an adaptive management approach. The first condition is that there is an imperative to act- there should be some requirement that action must be taken despite uncertainties. Not all issues require immediate action either due to the nature of the issue or the regulatory framework in which the issue resides. If a situation does not require immediate action or if there is not a political mandate for action, it may be wise to wait until more information is available. It is possible that as the issue evolves it may become apparent that no action is required.

The second condition is that the responsible party must have the institutional capacity and commitment to embark in an adaptive management program. Adaptive management is generally utilized in situations with high levels of uncertainty where initial efforts often produce unsatisfactory results or results that are of value only in the context of ongoing efforts. Given the long-term nature of these efforts, practitioners must have the dedication, financial and institutional backing to commit to both initial and long term investment, monitoring and evaluation.

Beyond these two primary requirements for application, there are six additional conditions identified by the Department of the Interior in their Adaptive Management Guide (2009).

Adaptive management is most applicable when:

- there are consequential decisions to be made
- an opportunity exists to apply learning
- objectives of management are clear
- the value of reducing uncertainty is high
- uncertainty can be expressed as a set of competing, testable models
- monitoring systems can be put in place with an expectation of reducing uncertainty (p. 9-14)

The BPNR Conservation Plan Update fulfills a number of these requirements. First, there is a mandate for action given the requirement for a conservation plan and management of the property that is consistent with the General Plan. There is now also an opportunity to apply learning because the plan has been in place for over ten years, showing which implementation measures have produced satisfactory outcomes. Opportunities for learning occur not only where management interventions have occurred, however. They also apply in situations where intervention has not occurred, either purposefully because inaction was the chosen action, or where action was intended but not accomplished. The city is now in a position to learn from both its deliberate actions and both intended and unintended consequences. What is perhaps the most pressing of these conditions, upon which other conditions depend, is that the project has clear

objectives. The lacking specificity of the previous plan's objectives make it difficult to assess progress, leaving room for improvement in this regard.

While some of these 'preconditions for success' are based on the nature of the resource issue to be confronted, many of them are based on the institutional context of the participating agencies. Organizations with a history of planning that shows acknowledgment of uncertainties and willingness to address the risks of moving forward in the face of unknown may be most receptive to an adaptive approach. Furthermore, agencies with a history of widespread stakeholder outreach and collaboration or persistent community relationships, may be most likely to support the potential for successful, ongoing adaptive practices. (Boswell, 2000)

Adaptive management requires ongoing support not only by those chiefly responsible for plan creation and implementation but by the higher levels of management as well. Dedication of project managers is important but without commitment of the broader institution, resources available at the start of the program may taper off at the learning stage, just when the potential for progress may be highest. This is in contrast to arguably more "traditional" planning processes, which focus effort and financing on plan creation and little on the monitoring, evaluation and reformulation that sets adaptive management apart. While the nature of this long-term support represents a philosophical departure for many planning agencies, the presence of adaptive management principles in previous local efforts such as the San Luis Obispo Open Space Guidelines may suggest that the approach could be compatible with the local planning processes. Institutions that show a history of or a potential to make this transition may provide the best fit for an adaptive management approach where the nature of the issues is appropriate. In the case of the Bishop Peak Natural Reserve, the nature of the resource challenges suggests adaptive management may be an appropriate approach. It remains to be seen however, whether

the approach (see Figure 1, Adaptive Management Flowchart) is feasible in the current institutional and political context.

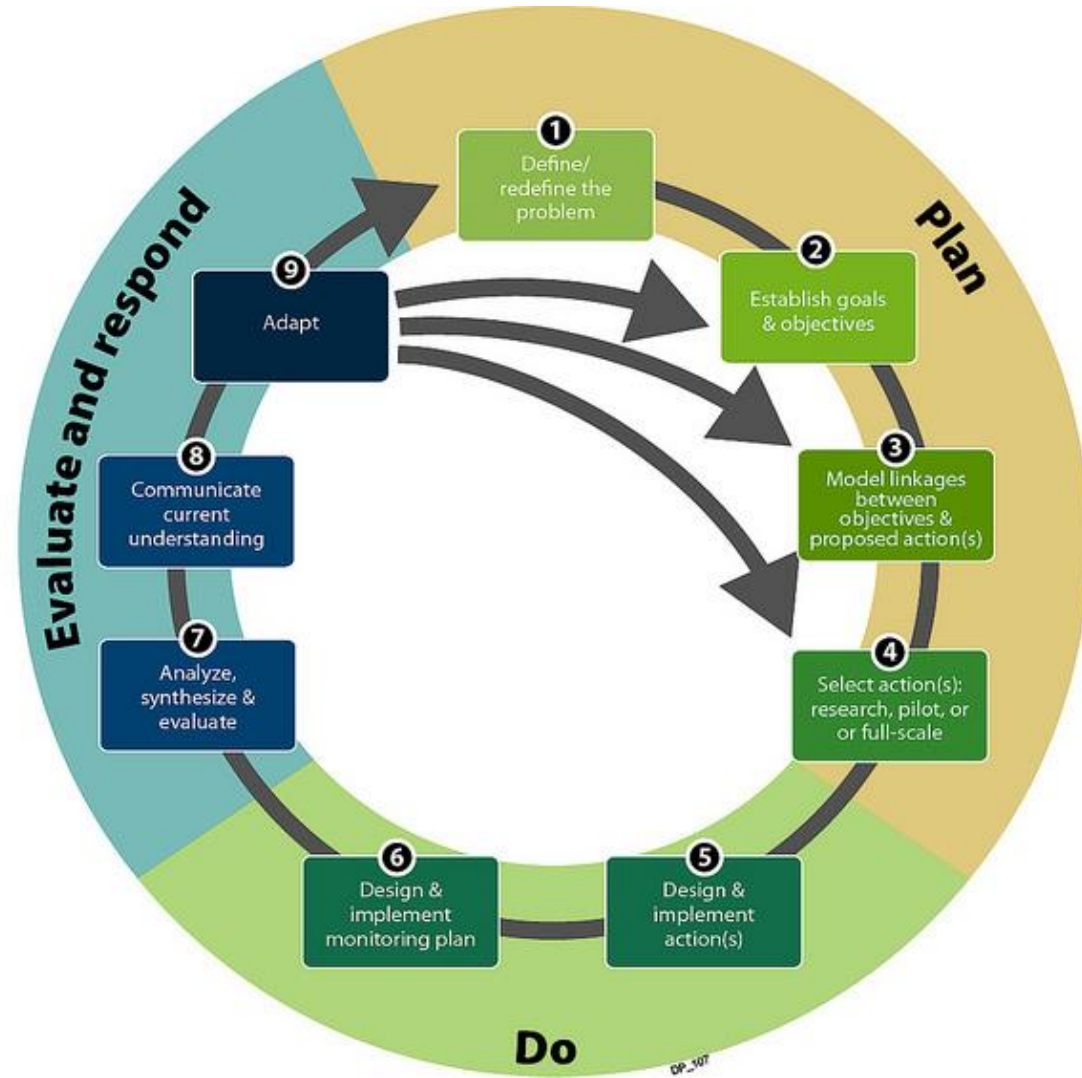


Figure 1 Adaptive Management Flowchart (Department of the Interior, 2009)

## **APPLIED ADAPTIVE MANAGEMENT**

From an operational point of view, adaptive management simply means learning by doing and consequently adapting to what is learned. (Walters, 1990) By doing so, a managing agency should produce both improved understanding of resource dynamics and improved resource management. The value of monitoring, analysis and the greater understanding they produce is measured by their contribution to achieving management objectives. The following chapter provides an overview of the operational sequence of adaptive management as applied in the update process of the BPNR Conservation Plan.

As discussed in the previous section, managers must first ask whether Adaptive Management is an appropriate approach in the context of their project. The Adaptive Management Technical Guide from the Department of the Interior offers a Problem Scoping Key that helps resource managers determine whether AM is appropriate for their particular scenario. The guide offers the following questions and states that the approach is only appropriate if all conditions are met. An attempt was made to answer each of these questions in the context of the BPNR:

1. Is some kind of management decision to be made? Yes
2. Can stakeholders be engaged? Maybe
3. Can management objectives be stated explicitly? Yes
4. Is decision making confounded by uncertainty about potential management impacts? Yes
5. Can resource relationships and management impacts be represented in models? Mostly
6. Can monitoring be designed to inform decision making? Yes
7. Can progress be measured in achieving management objectives? Yes
8. Can management actions be adjusted in response to what has been learned? Yes
9. Does the whole process fit within the appropriate legal framework? Yes

While the principles of Adaptive Management as described in the previous chapter may be applicable to a wide range of projects, practical application of the approach may apply to a much smaller scope of projects because of the stringent criteria for success. The previous chapter

discussed the theory and conceptual basis for AM but this chapter shows how its fundamental principles play out in application. Implementation of AM is often structured as two distinct phases: a planning or "set-up phase" where objectives and potential actions are developed and an iterative phase where these elements are put into action in further stages of the process cycle.

While the BPNR Conservation Plan meets a number of the criteria for successful implementation, the applicability of the approach hinges largely on one aspect in particular—stakeholder engagement and commitment. Outreach efforts showed that stakeholders can be engaged at least initially, but the question remains whether managing agencies can respond in a timely enough manner to be truly flexible, nimble and responsive as AM demands. Stakeholder engagement is one thing but long lasting dedication and responsive capacity is another. In the case of the Bishop Peak Natural Reserve Conservation Plan, primary stakeholders may be engaged but not necessarily to a degree that guarantees effective implementation. As the guide states, "without active stakeholder involvement, an adaptive management process is unlikely to be effective." While only time will tell whether the City (namely the Natural Resources Program and the Parks and Recreation Department) has the capacity to fully adhere to the approach, the plan progresses under the assumption that even partial adherence to Adaptive Management will improve management capacity and future implementation successes.

## STAKEHOLDER ENGAGEMENT

Stakeholder involvement is necessary for two primary reasons. Firstly, Adaptive Management is a difficult thing to do and to do well. It is often pursued in situations where managing agencies are confronted with an imperative to act despite high levels of uncertainty. Because of this, it is essential that practitioners utilize all sources of knowledge available to them. Stakeholder identification and engagement is the first step of the planning phase because it is the first step in

ensuring that the project is adequately informed. While a resource problem may be inherently complex, that complexity is multiplied when stakeholders cannot reach consensus on the definition of the problems. Stakeholders help to identify the scope of the resource problems, define objectives and create potential management actions. When consensus can be reached on these issues, the process will be more targeted and the potential for success is increased.

The popularity of Bishop Peak Natural Reserve and the nature of its impacts suggests that the number of stakeholders is quite large. In anticipation of the high level of interest the plan could generate, a Public Participation Plan was drafted. While the plan itself was not formally adopted, the practice of generating the plan helped to articulate and clarify personal objectives while providing an opportunity to discuss the process within the city to a degree which may not have otherwise occurred.

The plan contained the following elements to provide guidance during the planning process:

- the purpose of the plan
- the level of public interest anticipated
- a promise to the public
- available outreach methods
- goals of public consultation
- stakeholder identification

Stakeholders identified for the project were loosely divided into two groups- the general public and staff/professional consultants. The role of the public was largely to help in identifying issues, defining the problems to be addressed and to both suggest solutions and provide feedback on potential solutions. There was a distinction made between the general public and unique interest



groups such as neighbors, rock climbers and land-owners which helped to guide the method of outreach.

Staff consultation involved meetings with city and county employees who participate in implementation of the plan. They assisted in all steps of the process, aiding in issue identification, problem definition and creation of implementation measures. This step also involved the technical assistance of an environmental consultant. They provided an environmental inventory, identifying the natural resources on the reserve and noting the presence of plants and animals during the review period. Their role in policy development was to provide some of the raw, empirical data on which to ultimately base decisions.

It is important to note that a distinction was made between the roles of parties involved strictly for consultation and parties involved because of their role in implementing the plan.

Ultimately stakeholder outreach was comprised of community meetings, in-person one-on-one meetings and solicitation of feedback through email, written comments and the City's advisory body process.

Through the process a number of issues were identified by stakeholders, some of these issues included:

- Lack of enforcement of the City's Open Space Ordinance
- Nighttime use of the reserve
- Trail-cutting and creation of unofficial trails
- Accumulation of trash and litter, including dog feces
- Over-use
- General neighborhood parking conflicts

Through stakeholder engagement and existing conditions analysis, issues were identified and organized into focus areas, organized in the following format:

*Focus Area 1: Foothill Blvd Trailhead Impacts*

*Location: Foothill Blvd Entrance near 36 Foothill Blvd, southern side of BPNR*

*The trailhead on Foothill Blvd is a very popular access to the BPNR and its use predates the creation of the reserve. While the trail goes through two properties held by private owners, public access has not been challenged historically. Despite a general lack of conflict between landowners and the public, the lack of oversight or management for public use of the existing access poses a number of potential problems in terms of safety, aesthetics, resource protection, private property and enforcement. It also presents an opportunity for improved access, enhanced environmental quality and remedy of the aforementioned issues.*

*There are three primary issues with the existing trailhead in terms of vehicle safety, trail conditions and private property conflicts.*

*Parking and Roadway Danger*

*The Foothill Blvd entrance is located on a public right of way adjacent to Foothill Blvd and property of the Madonna Family. There is a parking area comprised of dirt and gravel that can accommodate roughly twenty cars parked perpendicular to one another. Cars entering the lot from the west must cross the road with oncoming traffic approaching at 45mph around a blind corner. Cars exiting the lot must contend with the same oncoming traffic around a blind corner, with both scenarios posing a risk to all drivers.*

*Trail Conditions*

- a. The trail crosses a seasonal creek immediately adjacent to the parking area. If the trail were to be adopted, provision for creek crossing must be provided to facilitate access.*
- b. The trail is presently situated upslope without switchbacks or other features to mitigate erosion or facilitate ease of use. The condition of the trail is highly degraded due to lack of adequate drainage or switchbacks. Both of these issues could be improved by formalizing the trail and redesigning the trail alignment.*
- c. The trail's location on a prominent south facing slope makes it a highly visible feature. The area is heavily grazed with little to no vegetation to stabilize the soil. Given the condition of the soil, the slope, the lack of adequate trail design and the fact that the area is highly trafficked by hikers, the trail is in poor condition and may be considered a visual scar on the landscape.*

*Property and Ownership*

a. *The trailhead is not sanctioned by the city and the trail from the parking area is not actively managed by the city. This presents issues in terms of potential liability for the property owner. Lack of formal agreement results in inability to properly manage the space and mitigate potential impacts. [Please see Appendix]*

## MANAGEMENT OBJECTIVES

One of the primary goals of the update process was to assess the progress of the plan in respect to its established objectives. In doing so, it became apparent that while previous objectives were front and center in the previous plan, their lack of clarity and precision made it difficult to determine whether they had been achieved. In the context of AM, managers must reduce uncertainties and confusion wherever possible. With stakeholder involvement this can be achieved through consensus building. Similarly, when determining objectives, it is crucial that they are written in a way that ensures clarity and measurability. The Department of the Interior (2009) suggests that objectives exhibit the following features:

- Specific
- Measurable
- Achievable
- Results-oriented
- Time-fixed

The 2004 Conservation Plan integrated some of these principles but it lacked specificity and many of its objectives were not measurable. To address this, each of the objectives were revisited and new tasks were developed that incorporated these principles.

## PREDICTIVE MODELS AND MONITORING PLANS

Predictive modeling is a step which involves identifying management alternatives and their potential costs and outcomes. Models can be highly complex and expressed through advanced computer programs or they can be as a simple verbal expression of cause and effect. One of the purposes of using a model is to offer predictions that can be later compared with actual results. By entertaining multiple models and thus multiple possibilities, managers can test their hypotheses and adjust accordingly (Westgate, 2013; Williams et. al. 1996). By clearly stating objectives in the plan and tying specific tasks to these objectives, it is implicit that managers believe said task will achieve said objective. More complex resource management projects may integrate modeling more explicitly in the future.

Monitoring measures such as photo monitoring can be used to evaluate the results of implementation measures and as well as the changes that may occur beyond areas of specific focus. Consistent monitoring provides the data that managers need to determine resource status and compare predictions about system dynamics and the influence of implementation measures. High quality monitoring activities like utilization of photo monitoring points rely on consistency to eliminate unnecessary variables and improve the value of the data. (Herweg & Steiner, 2002)

The San Luis Obispo Natural Resources Program has been utilizing photo monitoring points since the beginning of their conservation planning efforts. In the 2004 BPNR Conservation Plan, photo monitoring points were established in an inconsistent manner, often without clear explanation of why they were chosen or where they were taken. A photo monitoring guide was created in response to the lack of quality, consistency and direction. While many of the existing photo points were maintained and photographed again, new points were established to improve management capacity and place greater emphasis on areas of developing concern. Furthermore,

the development of technology including cell-phone cameras, gps, satellite imagery and affordable drone systems have increased the feasible means of obtaining imagery for continued monitoring. Aerial or satellite photography in particular present a new opportunity for monitoring macro level changes in ways that were previously inaccessible. As such, aerial imagery was incorporated into the plan and may be incorporated into more conservation plans in the future.

## ISSUES AND RESPONSES

Through the planning process issues were identified, needs were assessed, alternatives were explored and tasks were developed. At each step, principles of AM were incorporated wherever feasible. This was accomplished in large part by the use of empirical data collection methods including biological inventories and photo monitoring to evaluate changes since procurement of the reserve. These methods have shown that the BPNR is home to a wide variety of plants and animals and the reserve requires continued management to protect these species. With over 150,000 visitors per year and over 200 plant and wildlife species, protection of natural resources at the BPNR relies largely on adequate management of human impacts. This entails the limitation of the recreational footprint by limiting the distribution and nature of uses and enforcing the laws that articulate these limitations. In addition to the issues and tasks outlined in the previous BPNR, the 2015 update calls for the consideration of the following initiatives to provide for the continued stewardship, restoration, and management of the reserve.

### Natural Resources Protection

Biological surveys are the basis for natural resource management at the Bishop Peak Natural Reserve. The city has conducted a biological inventory and an evaluation of photo monitoring

points and will continue to monitor the reserve on a regular basis. The City will need to respond to these surveys by focusing on protection of habitat areas with an emphasis on sensitive species. While the biologic inventory shows the presence of sensitive species such as the Pallid Bat, further investigation may need to be done to identify their distribution throughout the reserve. The city should also consider maintaining some water in the pond to provide a water source for wildlife.

### Neighborhood Compatibility

With no dedicated parking for BPNR, the impacts of visitation volume is felt largely by surrounding residents. The City should continue to monitor traffic patterns on Highland Drive and Patricia Drive and apply traffic calming strategies where appropriate. In keeping with the mission of reducing impacts on surrounding neighborhoods and complying with principles of the LUCE, the City may also explore the possibility for improved access by alternative modes of travel including bus and bicycle. Night hiking creates a disturbance to sensitive nocturnal wildlife within the reserve and nearby residents and is expressly prohibited in open space. Night hiking may be deterred by a combination of mechanisms including continued enforcement, neighbor and police partnerships, clearer articulation of fines on signage and potential employment of night time parking restrictions on Highland Dr. and Patricia Dr.

### Trail Network Maintenance

The BPNR is one of the most heavily visited open spaces in San Luis Obispo City and the trail system bears much of the resulting pressures. The major issues facing the trail system are erosion, poor signage and presence of unofficial “use trails.” The City should upgrade existing signage along the trail network, and increase the availability of maps and other aids at

informational kiosks to educate the public and improve wayfinding. Erosion is a significant problem throughout the reserve, most notably at trail junctions and near the summit. The City should continue to implement trail rehabilitation projects and monitor their effects. Special emphasis should be placed on areas of high conservation value such as riparian areas and areas of very high use such as the summit trail. Unofficial use trails are present throughout the preserve. This may be due in part to lack of clear signage, as referenced above. Trails that are redundant, unsustainable or that represent a threat to natural resources should be decommissioned and given proper signage to encourage rehabilitation.

### Rock Climbing

While climbing is a historic and permitted use within the reserve, climbing activities should not interfere with roosting areas for bats and raptors. These areas should be identified, protected and monitored. Unauthorized installation of climbing bolts and establishment of climbing use trails should be addressed. Rock climbing areas shall be identified by the director and a permitting system should be developed for approval of all new routes to protect natural resources.

### Foothill Dr. Trail

Due to concerns of roadway safety at the unofficial trailhead at Foothill Dr., conditions should be monitored for increases in roadway conflicts. The City should explore the possibility of a formalized trailhead consistent the Land Use and Circulation Element of the General Plan. The junction of the bootleg trail originating at Foothill Dr. continues to erode, presenting trail management issues at multiple points of intersection with the summit trail. These junctions should be managed to reduce proliferation of use trails, reduce erosion, and limit impacts to surrounding vegetation.

### Fire, Rescue and Ranger Access

With an average of 2-3 calls for emergency assistance per month on the reserve, increasing fire danger from drought and the need for facilitated enforcement by park rangers, vehicle access should be improved for official use. This access should be minimally invasive with limited visibility, limited impacts to natural resources and surrounding neighborhoods.

### Grazing

The current grazing scheme has been successful however some riparian areas have been degraded. Grazing areas need further monitoring and areas of erosion or compaction need active management for restoration.

### SPECIFIC TASKS

Specific tasks were developed in consistency with previous documents and in fulfillment of the City's Conservation Guideline requirements for an implementation element. Specificity is desired



in defining the implementation tasks as well as their desired outcome or metric of success. Even so, some departments expressed fear that if tasks were too specific, they may not be appropriate amidst the uncertainties of future personnel and budgetary limitations. In response tasks were articulated in a way to provide general guidance and parties were named wherever possible to provide clarity for implementing parties and accountability to the general public. The following tasks do not fully mirror those represented in the finalized plan but instead represent a variety of options that were considered in plan development.

### Years 1-3

- Install new, updated signage throughout the trail network to identify official trails, decommissioned trails and climbing specific trails (Parks and Rec)
- Continue monitoring and maintenance of switchbacks on summit trail (Parks and Rec)
- Install new garbage receptacles at Highland Dr. and Patricia Dr. (Public Works)
- Establish new photo monitoring points consistent with Restoration Areas (Natural Resources)
- Work with climbing community to identify designated climbing zones and develop permit system for establishment of new routes (Parks and Rec)
- Undertaking additional studies pertaining to bats including population; roost locations; specific management implications

### Ongoing Specific Tasks

- Continue enforcement of open space regulations (Parks and Rec and County)
- Monitor ecosystem health (Natural Resources)
- Monitor trailhead impacts
- Pursue improvements of bootleg trail from Foothill Dr.

- Explore feasibility of fire, rescue and ranger access improvements using comparative matrix
- Reshoot photo monitoring points (Natural Resources)
- Monitor grazing regime, especially in riparian areas; install lower pasture project
- Maintain webpage for BPNR with management bulletin (Natural Resources)
- Pursue multi-modal transportation strategies for trailhead access (Transportation)

## LESSONS LEARNED

The primary goal of this project was to develop an update of the 2015 Bishop Peak Natural Reserve Conservation Plan. The secondary goal, explored in this background report was to identify opportunities for improved management through process improvements. In pursuit of these goals, the City identified Adaptive Management as a concept of interest. In scenarios typified by a breadth of uncertainties, this approach suggests viewing management as an experiment and an opportunity for learning. As such, it emphasizes the establishment of clear objectives, diverse and sustained stakeholder engagement, consideration of diverse alternatives, modeling of possible outcomes, ongoing monitoring and nimble responsiveness. A review of literature revealed that the management problems present at the BPNR would benefit from integration of Adaptive Management principles.

The plan engages in this process primarily through monitoring, evaluation and adjustment. It incorporates steps of the adaptive framework by utilizing new data sources like environmental inventories, photo monitoring, aerial monitoring, increased stakeholder engagement through online bulletins and coordination of volunteers, and improved tracking of implementation through an explicit report on progress. Even so, the plan itself cannot (or does not) represent the entirety of the approach, nor does it adhere closely to the principles of the scientific method as suggested by AM scholars. It does not play an active role in the design of predictive models or detailed implementation plans, nor does it provide the measurable objectives essential to the process. This is the result of the City's view that the plan is a strategic document- not a tactical document- and that greater specificity would hinder flexible decision making.

While the nature of the issues at BPNR may suggest AM as an appropriate approach to improving project outcomes, the contextual realities of the managing agencies (budget,

personnel, politics) suggests otherwise. The plan takes steps toward improving management capacity and project outcomes but for the promise of Adaptive Management to be fully realized, the agencies responsible for project management must see the plan for what it is- one component of a long term management process that requires ongoing effort, engaged stakeholders, consistent evaluation and increased accountability.

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**APPENDIX A**

**ISSUE WHITE PAPERS**



## Issue 1: Foothill Blvd Trailhead Impacts

### Location

Foothill Blvd Entrance near 36 Foothill Blvd, southern side of BPNR

### Interest

The trailhead on Foothill Blvd is a very popular access to the BPNR and yet it is not sanctioned by the city. This creates a number of problems in terms of safety, aesthetics, resource protection, private property conflicts and enforcement. It also presents an opportunity for improved access, environmental quality and remedy of the aforementioned issues.

### Constraints

There are three primary issues with the existing trailhead in terms of vehicle safety, trail conditions and private property conflicts.

#### 1. Parking and Roadway Danger

- a. The Foothill Blvd entrance is located on a public right of way adjacent to Foothill Blvd and property of the Madonna Family. There is a parking area comprised of dirt and gravel that can accommodate roughly twenty cars parked perpendicular to one another. Cars entering the lot from the west must cross the road with oncoming traffic approaching at 45mph around a blind corner. Cars exiting the lot must contend with the same oncoming traffic around a blind corner, with both scenarios posing a risk to all drivers.

#### Trail Conditions

- a. The trail crosses a seasonal creek immediately adjacent to the parking area. If the trail were to be adopted, provision for creek crossing must be provided to facilitate access.
- b. The trail is presently situated upslope without switchbacks or other features to mitigate erosion or facilitate ease of use. The condition of the trail is highly degraded due to lack of adequate drainage or switchbacks. Both of these issues could be improved by formalizing the trail and redesigning the trail alignment.
- c. The trail's location on a prominent south facing slope makes it a highly visible feature. The area is heavily grazed with little to no vegetation to stabilize the soil. Given the condition of the soil, the slope, the lack of adequate trail design and the fact that the area is highly trafficked by hikers, the trail is in poor condition and may be considered a visual scar on the landscape.

#### Property and Ownership

- a. The trailhead is not sanctioned by the city and the trail from the parking area is not actively managed by the city. This presents issues in terms of potential liability for the property owner. Lack of formal agreement results in inability to properly manage the space and mitigate potential impacts.

### Relevant Parties

1. Parking and Roadway Danger: City Transportation Engineers, Public Works Department
2. Trail Conditions: Natural Resources Program (Bob Hill), City Parks and Recreation, County Parks and Recreation
3. Property and Ownership: Property owner, Natural Resources Program (Bob Hill)

### Opportunities and Solutions

Given the popularity of the trail access and the related problem conditions, managing agencies, private landowners and the general public have incentive to confront the issue. Current opportunities include:

1. Positive relationship with land owner
2. Existing easement access to Quarry
3. General Plan mentions potential annexation of Bishop Knoll property located in Interim Open Space Zone and development plans include parking provisions and potential access point as well

Potential solutions may include:

1. Maintain Existing Conditions
  - a. Maintain existing conditions and confront issues as they present themselves  
Formalizing trailhead and parking area and incorporating trail into BPNR Conservation Plan
  - a. Making the trailhead official would require working with the private landowner to discuss easement potential, ultimately requiring approval of [city council]  
Eliminate Access
  - a. The city may wish to close access if formalizing access is deemed undesirable or infeasible due to inability to work with landowner, financial burden, parking and traffic regulations or related issues AND the city determines that maintenance of existing conditions is not acceptable.

#### Additional Notes

### Issue 2: Trail Conditions

#### Location

The entire trail system is affected with notable points on Ridge Trail, switchbacks below the peak, the trail near Carissa Boulders, the trail junction on Felsman Loop, and the junction at the Foothill Trail and Bishop Peak Trail among others.

#### Interest

The Bishop Peak Natural Reserve is one of the most heavily visited open spaces in San Luis Obispo City and County and the trail system bears much of the resulting pressures. Official trails have erosion issues that present challenges to environmental quality, visitor safety, access and sustainability of the trail systems.

#### Constraints

There are three primary issues with the trail network including both official and unofficial trails. These issues include erosion, wayfinding and creation of unofficial trails.

1. Erosion
  - a. Trails throughout the network are eroding to varying degrees depending upon location, soil type, vegetation cover, trail design, topography, degree of usage and other factors.
  - b. Trail erosion can place visitors at risk for falling, cause undue environmental harm through sediment deposition into creeks and require continued maintenance.

c. Trail cutting is a major cause of erosion when users cut across switchbacks or utilize shortcuts that cannot structurally sustain continued use or that degrade drainage mechanisms creating a self-reinforcing erosion problem.

#### Wayfinding

a. There are limited trail signs located throughout the preserve and those that are still in place are often faded, bent, weathered or are otherwise unreadable.

b. Many trail junctures do not have signs to indicate trail names or direction. This is due primarily to aging and the fact that many unofficial trails have cropped up near official trails, leading to confusion and in turn persistence of unofficial trails when confused visitors take the wrong trail.

#### Unofficial Trails

a. There are numerous trails that exist throughout the preserve that have been developed since the previous plan was established. These trails do not show up on trail maps, they do not have signs leading to confusion among visitors, potentially degraded visitor experience and even putting people at elevated safety risk.

b. Unofficial trails have not gone through vetting processes to ensure proper design including drainage mechanisms, erosion prevention and avoidance of negative environmental impacts.

c. Trails that do not exist on record may present undue challenges to fire or rescue services attempting to locate injured users or manage fires.

#### Relevant Parties

1. Erosion: City Parks and Rec (Ranger Doug), Public Works Park Maintenance (Jeff Hendricks), Natural Resources (Bob Hill)
2. Wayfinding: City Parks (Ranger Doug)
3. Unofficial Trails: City Parks, Natural Resources, County Parks

#### Opportunities and Solutions

Unofficial trails may exist where there are points of interests that official trails fail to reach. They are often an indicator of an otherwise unmet need. Beyond serving as potential indicators of visitor interest, unofficial trails are not necessarily poorly designed by virtue of the method of their creation. These trails may, in some cases be well designed and closely compatible with existing management standards, providing an opportunity for expansion of the official trail network for little additional investment.

Potential solutions may include:

1. Continue current maintenance regime

a. The existing regime detailed in the previous plan outlines minimum hours for city and county ranger patrols but details are limited on how this would be accomplished and these standards are not being met.

#### Create interagency trail maintenance system

a. Firstly this system would identify areas with trail management issues and prioritize problem areas. Secondly it would identify responsible parties and schedule deadlines for repair and scheme for regular maintenance. Thirdly it would identify mechanisms to prevent trail cutting such as installation of fencing or informational signage

## Additional Notes

### Issue 3: Highland Drive Trailhead

#### Location

Highland Drive is a very popular trailhead providing access to Bishop Peak, Felsman Loop, Carissa Boulders and other destinations. The trailhead is located in a single family, residential neighborhood at the end of Highland Drive with parking on one side of a narrow street.

#### Interest

Highland Drive may receive the largest number of visitors to the reserve which makes it of great interest to visitors and neighbors who live along Highland Drive.

#### Constraints

There are multiple issues facing this trailhead including garbage, parking and night hiking.

##### 1. Garbage

a. Lack of trash receptacles on the reserve means trash accumulation has become a problem along the trails. While the city encourages a “pack it in, pack it out” ethic, this is not being followed by a segment of the visiting public. In response to this problem, some volunteers have left garbage bags at the trailhead entrance. While these are eventually picked up by volunteers or presumably park rangers, they attract raccoons and other animals that tear through the bags and challenge the effectiveness of this approach.

##### Parking

a. Highland Drive is narrow, winding and steep with limited parking on one side of the road and no sidewalk near the trailhead. The combination of these factors creates a problem for pedestrian and cyclist safety.

##### Night Hiking

a. Although hiking at night is a violation of city ordinance, there is an ongoing nighttime presence of hikers, climbers and others presents an issue for search and rescue and local neighbors.

#### Relevant Parties

1. Garbage: City Parks and Rec (Stanwyck)
2. Parking: City Transportation Deputy Director Tim Bochum, Parking Services Manager (vacant)
3. Night Hiking: Police Neighborhood Officers Neighborhood 1 (Officer Adams and Sanchez)

#### Opportunities and Solutions

Trash pickup has not been a typical practice in city open spaces due to an overarching policy following “leave no trace” ethics. Enforcement is not easy because of personnel and budgetary constraints. While the city may wish to maintain adherence to these principles, the city may also want to consider an alternative that both appeals to neighborhood concerns, requires minimal investment of time and money while helping to encourage a trash free trailhead. Providing a single trash can at the trailhead entrance may serve to reduce trash not only at the trailhead but

also along the entire trail network. This would positively benefit the natural ecosystem as well as the experience of those living near and visiting the reserve.

1. Begin phased installment of trash receptacles at trailheads, beginning with the most problematic trailhead. Do a trash pickup along the trail and wait one month to monitor accumulation of trash on the trail. Then install a bin and monitor the accumulation of trash over a similar period of time. Based on effectiveness of trash receptacle, consider cost and benefit of further installations at other trailheads.

#### Applicable Statues and Regulations

12.22.050 L. Litter and Trash. Litter shall be disposed of properly. Disposal of trash or litter within or upon city open space lands is prohibited. Note: It is unclear if this prohibits disposal of trash into trash receptacles or if this regulation would need to be amended to accommodate new installations of on-site garbage cans.

#### Related Cases

### Issue 4: Grazing Plan

#### Location

Grazing occurs throughout the reserve

#### Interest

Grazing plays a significant role in management of the reserve in terms of vegetation management, ecosystem health, fuel load reduction for fire prevention and cost savings. Grazing is an important tool within the reserve with great potential for beneficial results however it is not properly managed it may create more problems than it resolves. Currently cows are grazing throughout the preserve with very limited oversight by the city resulting in visible degradation to creekbeds, soil compaction and destruction of potentially desired species.

#### Constraints

How is grazing managed today? How is it that the department doesn't know who's cows are on the reserve or how to contact the owner?

#### Relevant Parties

Private Landowners

City Natural Resources Program

Ranchers -

#### Opportunities and Solutions

The department needs greater control of how long spaces are grazed, where they are grazed and what time of the year it occurs. At this time, the management structure is unclear. Does the city manage through the landowners who contract with ranchers, are the landowners the ranchers, or should the city be working directly with the ranchers themselves?

#### Applicable Statues and Regulations

12.22.0203d. The open space principles state that uses on open space lands owned or managed by the city: 3. May consist of the following uses provided allowed uses are compatible with the purpose of the open space land: d. Grazing, farming, growing of nursery stock, gardening, and harvesting crops.

f. Restrictions upon animals in open space lands. 1. No person shall cause permit, or allow any animal owned or possessed by him or her or any animal in his or her custody or control to be present in open space lands except: g. Animals in the open space for grazing purposes pursuant to an agreement approved by the city council

### Related Cases

## Issue 5: Rock Climbing and Related Activities

### Location

Rock climbing exists throughout the reserve but is generally contained to the eastern rock faces, boulders just north of the pond and most recently slack lining has gained popularity between summit rocks.

### Interest

Rock climbing has historic precedent on the peak with records of rock climbing going back to World War II. The activity is explicitly permitted in Chapter 12.22 of San Luis Obispo municipal code. with restrictions governing establishment of new routes. Climbing is a popular activity on the reserve with new routes appearing in climbing guides every year. Regulations state that climbers wanting to establish new routes must apply for a permit but in reality there is no system available for such applications. Many of the areas where climbers frequent are home to sensitive species and unique ecosystems for birds, bats and rare plants that reside in steep crevices and caves. Establishment of new routes may threaten these ecosystems necessitating their regulation. Furthermore, there have been signs of herbicide use to maintain wall access and numerous use trails terminating at climbing areas now appear throughout the park.

### Constraints

### Relevant Parties

San Luis Obispo Climbing Gym "SLO Op

Flatirons Climbing Council- fhrc@flatironclimbing.org

City Parks and Recreation- Shelly Stanwick

### Opportunities and Solutions

A management plan specified to climbing was submitted some years ago by a local climber interested in establishing more structured management for climbing at Bishop Peak. The climbing community is actively engaged, well connected and has shown great interest in developing a plan.

1. Create a permitting program, modeled after a similar program in Boulder Colorado

#### Applicable Statutes and Regulations

Municipal Code 12.22.040 C. C. "Climbing area" means an area within a city open space land suitable for, and designated for, climbing with the use of ropes, climbing bolts, and other specialized equipment.

12.22.050 N N. Climbing Only in Designated Areas and Routes—Waiver Required—Installation of New Bolts Prohibited without Authorization—Advisory Committee.

1. Rock-climbing is permitted only within specific designated areas on city open space lands. Said areas shall be identified by the director, who may also make reasonable rules concerning such use, including but not limited to requirements for waivers of liability as a condition of permission for such use.

2. No person shall set or install climbing bolts in any designated climbing area without the written approval of the director.

3. The director shall appoint a committee of persons interested in climbing to advise him or her on matters affecting designated climbing areas, including but not limited to reviewing requests for new climbing routes, inspections of climbing areas, climbing bolts installed therein, or other matters pertaining to the operation and maintenance of the area.

#### Related Cases

The Open Space and Mountain Parks Division of the City of Boulder Colorado regulates the installation and repair of fixed climbing hardware through a unique permitting process. Climbers wishing to establish new routes send an email describing the proposed route, number of new bolts, area, cliff or rock face and contact information along with a completed "Application for New Bolted Route" to both the city and the local non-profit climbing organization. A fixed hardware review committee reviews the application and makes recommendations to the parks department which makes the ultimate decision. Installation of new routes and repairs are both regulated in part, to ensure that sensitive bat and raptor species are not disturbed by the presence of climbers or the noise of installation, especially during nesting season.

## **APPENDIX B**

### **PHOTO MONITORING GUIDELINES FOR OPEN SPACE**



## *Introduction*

Photo point monitoring is a method of evaluating visible changes in the landscape through scheduled and consistent acquisition of visual data at fixed points over a period of time. The method can include photography taken on the ground or from the air. Both methods are useful in assessing changes but each lends itself to different scales of assessment. Aerial monitoring may involve photographs taken from aircraft such as airplane, helicopter, or unmanned drone. These methods may be most useful in identifying macro level changes over a large viewshed such as the development of new trails or the spread of disease throughout a reserve. On the ground photographs are best to assess micro level changes at a perspective most similar to an on-site visit. These photo points are best for providing high resolution imagery of small areas of special concern. Applications for this method may include, monitoring of post-wildfire habitat succession or changes in trail conditions such as erosion or braiding.

## *Siting Considerations*

Since the benefits of photo monitoring are realized after significant time horizons, siting of ground photo points is the most important step in the process. Proper siting will provide clear and useful data to support management capacity and increase the potential for success. There is value in establishing points to capture both areas of specific concern as well as more general indicator points throughout the space. Siting should follow management objectives, where managers determine that such data could improve the quality of decision making and reduce uncertainties. When establishing monitoring sites, consider the following the questions:

- Will the photo capture an “area of interest?”
- Will the data contained within the photo improve management capacity?
- Will changes be visible in the photo?
- Can this photo be replicated in a consistent manner?
- Will the location of the point need to change over time?

Location of aerial monitoring points is less crucial in terms of data acquisition because of the broad scale of this approach. That being said, establishment of assessment zones is helpful for purposes of analysis. It may be wise to establish quadrants or general monitoring zones to organize comparisons over time. For instance, areas may be designated based upon habitat type, divided into a grid, or separated by land use designation- whichever is most aligned with the issue at hand or the management strategy being employed.

## *Capturing and Cataloging*

Photo monitoring provides data regarding changes to a space over time. The quality of the photographs has a direct relationship with the ability of a resource manager to evaluate and utilize the data contained therein. One of the ways to ensure good quality photographs is to reduce variability between one sample and the next. To achieve this, photographers should do the following:

- Mark each photo point location in the field
- Record GPS coordinates for each photo point location
- Record detailed directions for locating and photographing the points
- Develop a map of photo points

Use of GPS coordinates will assist in creation of a Photo Point Map and help photographers locate monitoring areas. While GPS will help monitors locate the general area, use of on-the-ground features, such as surveying stakes will provide greater guidance and limit variability between collection dates. Marking of locations can be achieved by installing markers on-site. Markers may include a t-post, wood survey stake or capped rebar. Wherever possible, utilize a natural feature such as prominent boulder, existing fence post or other minimally invasive marker. Beyond GPS, ground markers and a site mapmonitors may also wish to include instructions for how to reach the location. The direction of the photograph should be indicated in the title of the photo, especially where natural features are not clear enough to provide orientation. Monitors may also wish to utilize a log to note field conditions to supplement the visual data.

## **APPENDIX C**

### **BISHOP PEAK NATURAL RESERVE CONSERVATION PLAN DRAFT**

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# **BISHOP PEAK NATURAL RESERVE CONSERVATION PLAN**

## **2015 UPDATE**

*Final Legislative Review Draft*



**City of San Luis Obispo**  
City Administration

Natural Resources Program

990 Palm Street

San Luis Obispo, CA 93401



**July 2015**

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# Bishop Peak Natural Reserve Conservation Plan 2015 Update

*Final Legislative Review Draft*

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### MAP AND PHOTO CREDIT

Douglas Bush  
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### Special Note to Reader – 2015 Update Legislative Review Draft

The Bishop Peak Natural Reserve Conservation Plan 2015 Update is intended to supplement and amend the prior Bishop Peak Natural Reserve Conservation Plan that was adopted by the City Council in January 2004. It is presented here in Legislative Review Draft or "track changes" format in order for the reader to be able to quickly recognize what portions of the 2004 plan remain unchanged, and what portions of the plan are being amended or recommended for deletion. The original 2004 text begins with Chapter 1. From that point forth, text that has been changed or deleted will show in red with a strikethrough line (e.g. ~~change or delete~~) while text that has been added as a new change will show in red with an underline (e.g. new text). Sections that have been moved will have double strikethrough lines (e.g. ~~~~moved section~~~~) and will have double underlining at the location where that section was moved to (e.g. moved section). All maps and photos have been updated and replaced. Upon final adoption of the 2015 Update, "track changes" will be turned off and a "clean" version of the final document will be published.



## 2015 Updates

Bishop Peak Natural Reserve ("BPNR" or "the Reserve") is one of the most iconic and well-loved landmarks in the entire region offering spectacular panoramic views of the City below and the surrounding region beyond, remarkable plant and wildlife diversity, and pleasant hiking and passive recreational opportunities. The City's first ever conservation plan was prepared for BPNR and subsequently adopted by City Council in 2004. A conservation plan is generally intended to have a 7 to 10 year time horizon, at which time it should be updated.

Over a decade has passed since the plan's initial introduction and a number of new challenges have emerged, including continued natural resources protection; neighborhood compatibility in the areas around the two primary trailheads; increased use pressure leading to needs for trail maintenance and heightened levels of enforcement; and, continued investigation of emergency response access. With these issues in mind, this Conservation Plan Update serves as an opportunity to assess the current state of the Reserve, monitor the implementation of the existing plan, and to establish timely strategies for further protection and enhancement of the Reserve. For these reasons, BPNR is now the subject of a Conservation Plan Update process in order for the property to continue to be managed in accordance with the City's Open Space Regulations and the Conservation and Open Space Element of the City's General Plan, while incorporating new information and addressing the ongoing management concerns that have been identified by staff as well as members of the public.

### ***New and Ongoing Management Issues or Concerns Associated with BPNR***

The Bishop Peak Natural Reserve Conservation Plan 2015 Update provides a framework to address the continued long-term site stewardship of the property. In addition to issues identified in 2004, the Bishop Peak Conservation Plan Update places a renewed emphasis in the following areas:

1. **Natural Resources Protection.** In keeping with the principles of the Conservation and Open Space and Element of the General Plan, the plan prioritizes protection of Natural Resources, providing for passive recreation where compatible. Many of the issues addressed in the Conservation Plan Update stem from this objective, seeking to enhance natural resources while minimizing impacts of recreational uses. An updated biological inventory was completed by the local firm Terra Verde Environmental Consulting, *Summary and Results of a Plant Inventory and Wildlife Survey at Bishop Peak Natural Reserve, City of San Luis Obispo, California*, that identifies 201 botanical species, nine plant communities, and 54 wildlife species. Of those, two plant species, one plant community, and seven wildlife species are considered to be under some level of protective special-status. Of note, Terra Verde identified seven different bat species that

were previously indistinguishable due to the advent of relatively new, full spectrum acoustic survey technology that was not available in the 2002-2004 timeframe when the prior conservation plan was underway; three of these are special-status species. In addition, a Cal Poly senior project undertaken by Ms. Jessica Engdahl under the guidance of Dr. John Perrine and City Biologist Freddy Otte, *Wildlife Survey and Identification of Game Trails, Bishop Peak Natural Reserve, Fall 2013*, revealed numerous terrestrial wildlife species using the Reserve at night with the use of remote-sensing wildlife game cameras deployed at several fixed monitoring stations.

2. **Trail Network Maintenance.** The existing trail network faces erosion, widening and trail cutting and expansion of unofficial trails, each presenting a threat to the experience of recreational users, as well as the protection of natural resources. Weathering and vandalism of signage and lack of adequate signage may further compound these issues. Recent counts of users accessing BPNR suggest that over 150,000 visitors a year enter the Reserve, and most of the trails within BPNR are approaching 20 years or more of continuous use since they were first installed.
3. **Neighborhood Compatibility Improvements.** With a high volume of visitors and access limited to residential trailheads with no off-street parking facilities, some impacts are felt disproportionately by surrounding neighborhoods. Outreach to neighboring residents indicates that issues include night hiking, camping, roadway safety, litter and noise. Lack of consistent enforcement of existing municipal code was also identified as an area of primary concern.
4. **Rock Climbing Management.** While climbing is an approved, historic use that pre-dates the City's ownership of the Reserve, new fixed anchor "bolted" routes and access trails have expanded over the last decade presenting a challenge to management objectives. Recent site visits identified establishment of an unpermitted stone and concrete bench, as well as unauthorized pruning and herbicide application to vegetation.
5. **Unauthorized Foothill Boulevard Access.** The trailhead on Foothill Blvd. is a very popular access to BPNR and yet it remains an unapproved trailhead that relies on a trail running through private ranch property. This creates a number of problems in terms of trespass, safety, aesthetics, resource protection and enforcement.
6. **Emergency Access and Ranger Patrol Improvements.** Current emergency access points limit the speed and response time with which City fire fighter-paramedics can respond to incidents at the Reserve. With an average of 2-3 calls for emergency response every month and an increase of fire hazard due to sustained drought conditions, a more efficient access point, to be further investigated and considered separately in the future, may increase safety for visitors to the Reserve and neighbors living in the wildland-urban interface zone.

### **2015 Update Recommendations**

Active management of the Reserve is necessary to protect valued natural resources while facilitating approved activities where compatible. Updated wildlife inventories and photo monitoring analysis have shown that the BPNR is home to a wide variety of plants and animals

and the Reserve requires continued management to protect these species. With over 150,000 visitors per year (Riggs et. al., 2015) and over 200 plant species and 54 wildlife species (Terra Verde, 2015), protection of natural resources at the BPNR relies largely on adequate management of human impacts. This entails the limitation of the recreational footprint by limiting the distribution and nature of uses and enforcing the laws that articulate these limitations. In addition to the issues and tasks outlined in the previous conservation plan, the 2015 Update calls for the consideration of the following initiatives to provide for the continued stewardship, restoration, and management of the Reserve.

1. **Natural Resources Protection.** Biological surveys are the basis for natural resource management at the Bishop Peak Natural Reserve. The City has conducted a biological inventory and an evaluation of photo monitoring points and aerial photography comparing 2004 to current conditions, and will continue to monitor the Reserve on a regular basis. The City will need to respond to these surveys by focusing on protection of habitat areas with an emphasis on sensitive species. While the biological inventory shows the presence of sensitive species such as the Townsend's big-eared bat and Pallid bat, further investigation will need to be done to identify their distribution and abundance throughout the cliffs and cave features within the Reserve. The City should also consider maintaining additional water in the stock pond by excavating silt that has accumulated in order to provide a water source for wildlife and insect prey-base for species such as bats.

Garbage and dog feces present an issue for both resource protection and neighborhood compatibility. While "leave no trace" or "pack it in - pack it out" principles encouraging user-based management of litter are less resource intensive, they have not proven to be effective in a municipal open space setting such as Bishop Peak Natural Reserve. In response, the City will install wildlife-friendly garbage receptacles at trailheads along with "mutt mitt" dispensers for dog owners.

2. **Neighborhood Compatibility.** With no dedicated parking for BPNR, the impacts of visitation volume are felt largely by surrounding residents. The City will conduct a formal traffic study and will continue to monitor traffic patterns on Highland Drive and Patricia Drive and apply traffic management strategies where appropriate, consistent with the City's Land Use and Circulation Element (LUCE) policies found in Chapters 7 and 8 pertaining to residential street design standards, levels of service, and neighborhood traffic management. In keeping with the mission of reducing impacts on surrounding neighborhoods and complying with mode share split objectives of the LUCE, the City will advocate and work towards improved access by alternative modes of travel including transit, bicycle, walking and other forms as a demand-reduction strategy wherein the goal is for 50% of all trips to BPNR to be accommodated in this way (12% transit, 20% bicycle, 18% walking or other forms). At present, survey data indicates that open space visitors, in general, are comprised of 68% driving, 8% bicycle, 12% walking, and 12% other or multiple modes (Riggs et. al., 2015).

Night hiking creates a disturbance to sensitive nocturnal wildlife within the Reserve and nearby residents and is expressly prohibited under the City's Open Space Regulations. Night hiking may be deterred by a combination of mechanisms including continued enforcement, neighbor and police partnerships, clearer articulation of fines on signage, and through employment of night time parking restrictions on Highland Drive and Patricia Drive.

The Conservation Plan Update introduces the Good Neighbor Policy, below, for the first time as a means of articulating the City's pledge to both residential and agricultural ranch property neighbors:

1. The City will ensure pro-active outreach and communications with neighbors.
  2. The City will promote partnership efforts with neighbors and other citizens to provide stewardship and care for the land and surroundings.
  3. The City will use best practices to educate open space users about the importance of respecting neighbors and private property, as well as adherence to Open Space Regulations.
  4. The City will actively address citizen concerns in a timely manner.
  5. The City will not actively promote Bishop Peak Natural Reserve as a tourist destination location through media outlets, advertisements, and publications.
3. **Trail Network Maintenance.** The BPNR is one of the most heavily visited open spaces in the City's open space network and the trail system bares much of the resulting pressures. The major issues facing the trail system are erosion, poor signage and presence of unofficial "use trails." The City will upgrade existing signage along the trail network, increase the availability of maps and other technological aids, and install two new informational kiosks to educate the public and improve wayfinding.

Erosion is a significant problem throughout the Reserve, most notably at trail junctions and near the summit. The City will continue to implement trail rehabilitation projects and monitor their effects. Special emphasis should be placed on areas of high conservation value such as riparian areas and areas of very high use such as the summit trail. Qualitatively, Levels of Acceptable Change (LAC) have been exceeded in the upper reaches of the summit trail, and a reclassification of two areas from "Management / Trail Corridor" to "Restoration" appears warranted pursuant to the *Conservation Guidelines for Open Space Lands of the City of San Luis Obispo* (2002; see pgs. 8-10). Unofficial use trails are present throughout the Reserve. This may be due in part to lack of clear signage, as referenced above. Trails that are redundant, unsustainable or that represent a threat to natural resources will be decommissioned and given proper signage to encourage rehabilitation.

4. **Rock Climbing.** While climbing is a historic and permitted use within the Reserve, climbing activities should not interfere with roosting areas for bats and raptors, rare plant protection, and overall management goals for the Reserve. Climbing areas should be identified, protected and monitored.

Unauthorized installation of climbing bolts and establishment of climbing use trails should be addressed. For the most part, climbers are outstanding stewards of the rock and surrounding environment. At present it appears that there are just a few "bad actors" and increased attention to climbing areas is warranted in order to interact more with the climbing community and raise awareness of Open Space Regulations 12.22.050(N) pertaining to climbing activities, which are as follows:

1. Rock-climbing is permitted only within specific designated areas on city open space lands. Said areas shall be identified by the [Parks and Recreation] director, who may also make reasonable rules concerning such use, including but not limited to requirements for waivers of liability as a condition of permission for such use.

2. No person shall set or install climbing bolts in any designated climbing area without the written approval of the director.

3. The director shall appoint a committee of persons interested in climbing to advise him or her on matters affecting designated climbing areas, including but not limited to reviewing requests for new climbing routes, inspections of climbing areas, climbing bolts installed therein, or other matters pertaining to the operation and maintenance of the area.

The Conservation Plan Update introduces climbing management guidelines for the first time as a way of articulating specifically to the climbing community the City's expectations for resource protection and sustainable use of the Reserve's cliffs and rock faces. See Appendix D.

5. **Foothill Boulevard Trail.** Due to concerns of roadway safety at the unofficial trailhead at Foothill Blvd., conditions should be monitored for increases in roadway conflicts. The City will require a formalized trailhead and parking area consistent with Chapter 8 of the Land Use Element of the General Plan (See Program 8.15 North Side of Foothill [Bishop Knoll]: "Development shall provide a parking lot and trail access to Bishop Peak.")

The junction of the bootleg trail originating at Foothill Blvd. continues to erode, presenting aesthetic concerns and trail management issues at multiple points of intersection with the summit trail. These junctions should be managed to reduce proliferation of use trails, reduce erosion, and limit impacts to surrounding vegetation. Ideally, the establishment of a new trailhead at the Bishop Knoll site would also provide an opportunity to restore and re-route sections of the upper trail as it approaches the Reserve. Any site work in this area will require close coordination with the County of San Luis Obispo.

6. **Emergency Response and Ranger Access.** The prior 2004 conservation plan included the consideration of emergency access as one of its goals:

3.27 The establishment of a connection road across the site for emergency and maintenance access that will eliminate the requirement for access through the Brittany Court development at the end of Highland Drive should be considered.

With the current average of 2-3 calls for emergency assistance per month to the Reserve, increasing fire danger associated with the current drought, and the need to facilitate enhanced Ranger patrol, vehicle access improvements for official uses were evaluated as part of this planning process. The range of emergencies in the Reserve managed by City firefighter-paramedics spans the spectrum from twisted ankles and mild dehydration to limb threatening fractures and heart attacks. At the same time, emergency access should be minimally invasive, with limited impacts to natural resources, aesthetics and surrounding neighborhoods.

With these goals in mind, staff identified a new trail section to facilitate emergency and Ranger access located just below the stock pond area of the Reserve and above Patricia Drive. This proposal entailed a new drive-able trail section that would be approximately 580 feet long and 8 feet wide, while decommissioning and restoring an approximately 620 foot section of adjacent trail switchbacks that are 4 feet wide, and re-

grading a 600 foot section of existing trail that has become eroded over the years. This proposal was reviewed at the public workshop meetings, as well as by the Planning Commission. Numerous neighbors expressed strong concerns for this proposal, however, and the Planning Commission agreed. Their recommendation to the City Council is that this Conservation Plan Update should not reflect the Patricia Drive emergency access; rather, a study of different potential emergency access locations should be provided to the City Council that compares alternatives using evaluative criteria.

In summary, the Emergency Access Alternatives Study looks at six different options that are evaluated using six separate criteria. The preferred alternative appears to be formally establishing the Brittany Court access that the City has historically used by permission from the controlling property owner, Mr. Felton Ferrini. Both Fire Department and Natural Resources staff have met with Mr. Ferrini in the past year and he has been clear that he is no longer willing to accommodate emergency access through Brittany Court by permission. The City does have an access easement for utilities maintenance purposes only (to access the water tank above the pond), and it appears at this time that the City would need to pursue a real property negotiation to expand the scope of the existing easement, pursuant to future City Council authorization and direction regarding price and terms. The Emergency Access Alternatives Study is available under separate cover.

7. **Grazing.** Mr. Webb Tartaglia has been the long-standing cattle operator at the Reserve in collaboration with the Ferrini family that enjoys a reserved grazing right. Mr. Tartaglia stocks fourteen mother and calf pairs each spring season. The current grazing regime has been mostly successful, and two special status botanical species identified by Terra Verde Environmental (San Luis Obispo owl's clover and Cambria morning glory) have been prolific in grazed areas. These species appear to prefer a disturbance regime created through animal grazing impact and a decrease in competition from annual grasses and other forb species, as well as thistles and other weedy species. The prior 2004 conservation plan called for a fencing project to protect and restore the riparian area in the lower pasture. This plan includes a more clearly defined project area and planting palette in order set the stage for project implementation. Lastly, the excavation of the accumulated silt in the stock pond would not only be beneficial from a natural resources management perspective, as above, it would provide more reliable stock water supply from season to season, as well as a potential water supply source for active firefighting when aerial water drop tactics are employed.

## 1. Introduction<sup>1</sup>

Bishop Peak Natural Reserve (BPNR) is a 352-acre open space located in the northwest part of the City of San Luis Obispo (Figure 1). The three-pointed summit is the tallest and most distinctive of the peaks that make up the string of Morros known locally as the nine sisters. BPNR is jointly managed by the City and County of San Luis Obispo. The Reserve is an important element of the local community's setting and character. It provides opportunities for enjoyment of the natural environment and is a favorite spot for hiking, picnicking, and rock climbing by local residents and students from nearby CalPoly University.

### 1.1 Background

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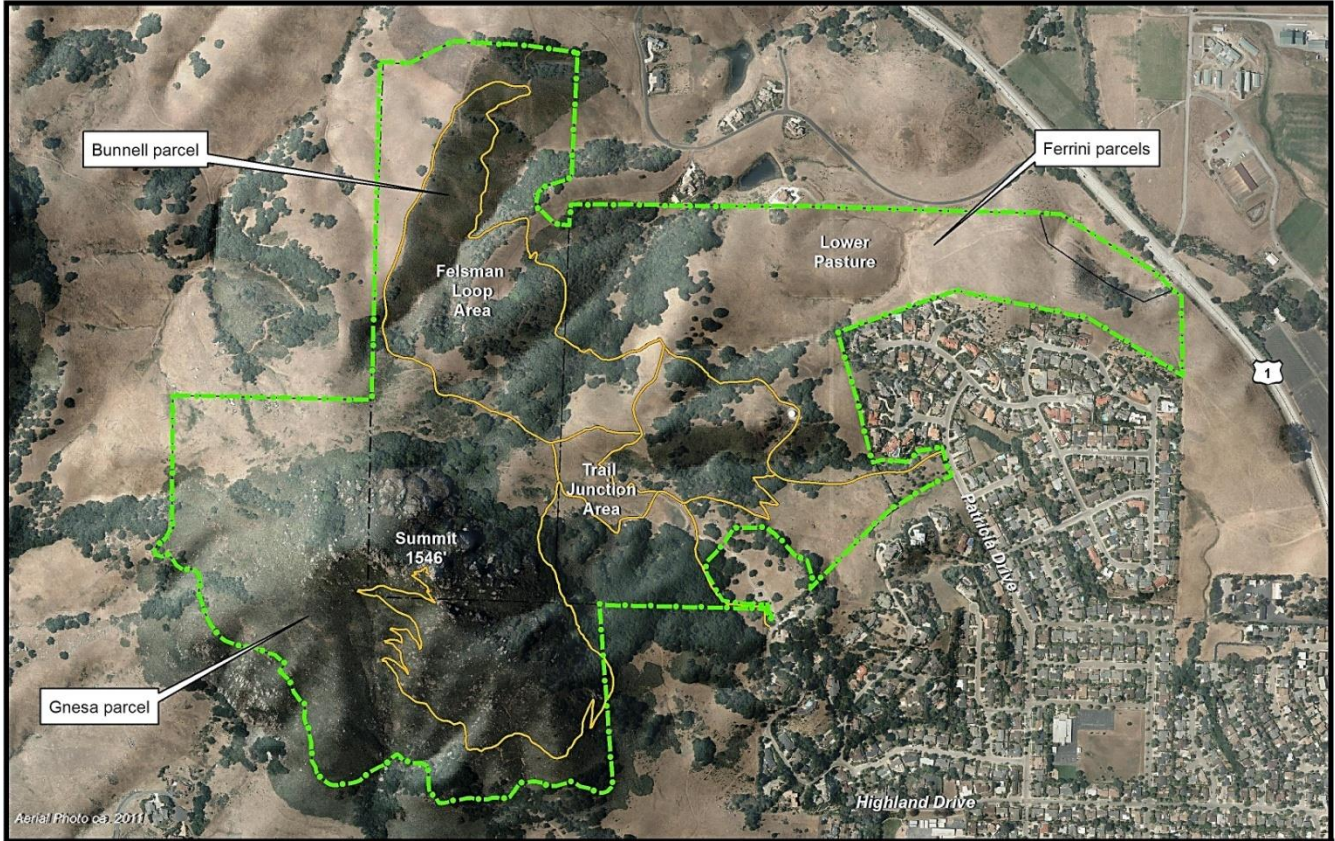
<sup>1</sup>Original 2004 text and Legislative Review Draft formatting starts here.

The Morros are a series of intrusions into the overlying rock that formed approximately 25 million years ago as part of the Franciscan Formation. They cover a 40-square-mile area from Morro Rock (to the northwest in Morro Bay) to Islay Hill on the southeast side of the City of San Luis Obispo. These formations cannot be considered true volcanoes, in that they did not erupt and spew lava or ash over the countryside. Instead, magma deep within the earth found a weak spot in the earth's crust, and pushed through the overlying rocks like toothpaste being squeezed out of a tube. The rocks of the Morros, a type of basalt known as dacite, are between 24 and 26 million years old. Since that time, the overlying rocks have eroded away and the hard, erosion-resistant dacite has remained, leaving the prominent Morros that we see today. This material, like most volcanic rock, is quite resistant to erosion and thus leaves very steep sides and other features that contribute to the striking quality of the City of San Luis Obispo skyline. Bishop Peak, tallest of the Morros, reaches an elevation of 1,546 feet above sea level.

## *1.2 History*

Bishop Peak was first given that title by Spanish missionaries who perceived a resemblance between the peak and the cap or miter worn by the bishops of the time. The peak together with other Morros has always been an area landmark. It has also been a source of some economic exploitation over the years, principally for stone. At least two and possibly three small quarry operations have gone on at various locations around the base of the peak over the years. The mountain was quarried most heavily during the late 1800s and early 1900s, when rock was removed to build the breakwater at Port San Luis. To haul the rock from Bishop peak to the Port a narrow gauge railway was built from the Pacific Coast Line in San Luis Obispo, through the Avila valley to Port San Luis.

All quarrying activities were small or intermittent operations, and none succeeded in removing large quantities of material from the mountain. Bishop Peak has long been perceived as a community landmark, and many parties were interested in preserving the peak to provide public access and to preserve its natural beauties forever. In 1977 the heirs of the Gnesa Ranch donated the land above the 800-foot elevation (approximately 104 acres) to the State Parks Foundation; this land is now managed by the County of San Luis Obispo. In 1995, an additional 140 acres was donated to the City of San Luis Obispo as the Ferrini Ranch Open Space. In 1998, 108 acres were purchased from Ray Bunnell, and has brought the Bishop Peak Natural Reserve to its present size of approximately 352 acres. The property now has a trail that goes from the official access points at Patricia Drive and Highland Drive to the summit, a distance of two miles with an elevation gain of 1,000 feet. Another trail known as Felsman Loop, traverses several canyons in the northern part of the Reserve and provides interesting views of oak woodland, chaparral, and coastal sage scrub, as well as attractive views of the surrounding area. Management of BPNR is a joint program of the City and County of San Luis Obispo.



**Map Key:**

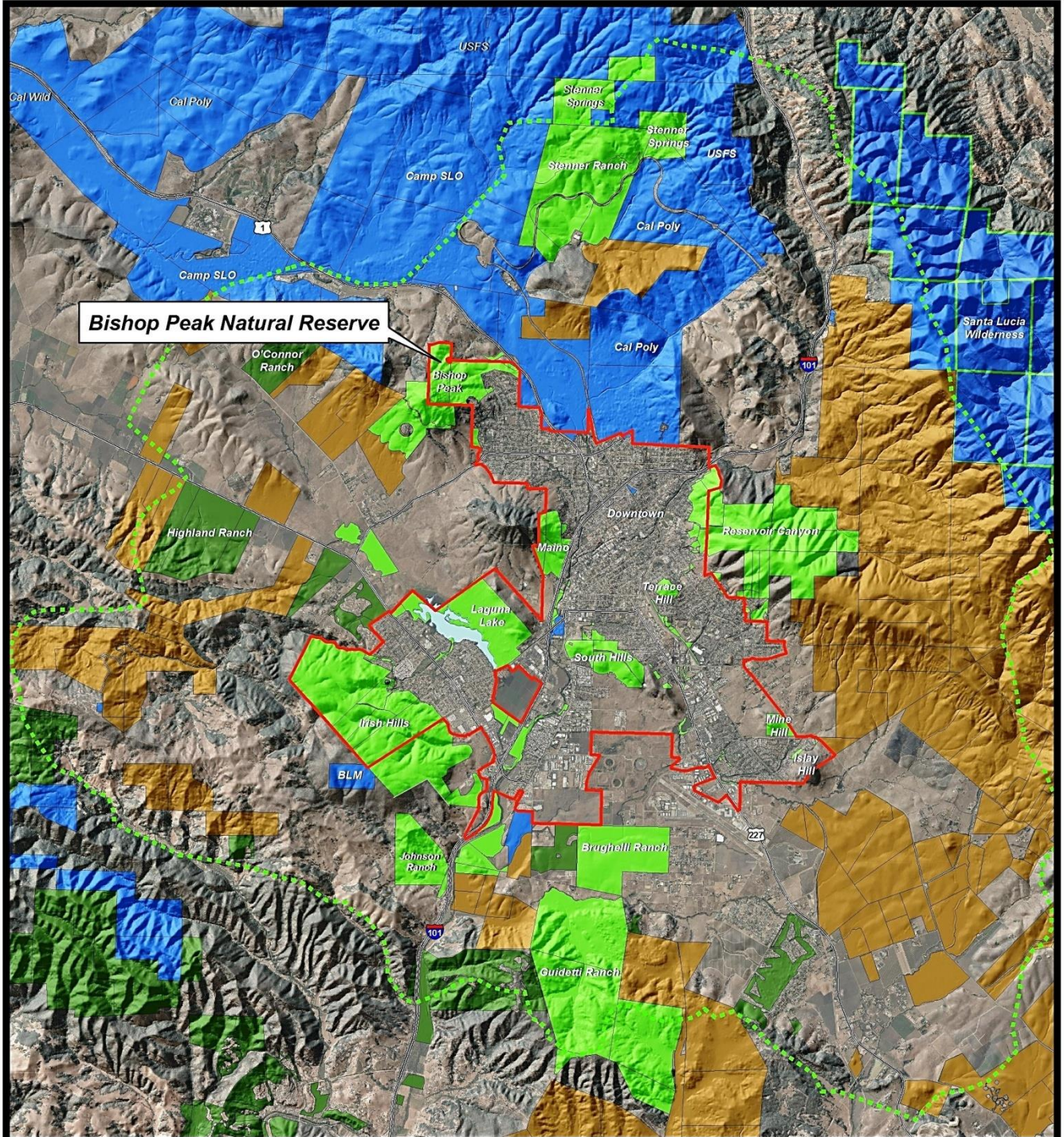
	Bishop Peak Natural Reserve Boundary
	Bishop Peak Natural Reserve Parcels
	Bishop Peak Natural Reserve Trails

**Bishop Peak Natural Reserve  
Conservation Plan 2015 Update**

Scale: 0 500 1,000 1,500 2,000 Feet






**Site Map**





**Bishop Peak Natural Reserve**

**Map Key:**

-  Greenbelt Boundary
-  City Limit
-  City of SLO Conservation and Open Space
-  Other Conservation and Open Space
-  Public Lands
-  Williamson Act
-  Wilderness Area

**Bishop Peak Natural Reserve:  
San Luis Obispo Greenbelt Context**

**Scale:**



### 1.3 Legal Background

BPNR was acquired as several different parcels. Two of these parcels totaling 248 acres were acquired by the City of San Luis Obispo, the other 104 acres was a donation to the State of California which is managed by the County of San Luis Obispo. Several conditions were attached to these acquisitions, two of which were donations, and these conditions are legally binding upon the City and County in the management of the Reserve. Among the conditions are:

#### Ferrini Open Space

- Access
  - Emergency Services: Yes (lower area only)
  - BPNR Maintenance: Yes (lower area only)
  - Utilities: Yes
  - Horses: No
  - Mountain Biking: No
  - Foot Traffic: Yes
  - Grazing: Yes

#### Bunnell Open Space

- Access
  - Emergency Services: Yes
  - BPNR Maintenance: Yes
  - Utilities: Yes
  - Horses: Yes
  - Mountain Biking No.
  - Foot Traffic: Yes
  - Grazing: No

#### Gnesa Open Space

- Access
  - Emergency Services: No
  - Maintenance: No
  - Utilities: Not Required
  - Horses: No
  - Mountain Biking: No
  - Foot Traffic: Yes
  - Grazing: No

In addition, horses boarded at the stables on the former Bunnell property have a right of use of the trails on the portion of the Reserve purchased from Ray Bunnell (Figure 1) as said trails existed at the time of the March 1998 purchase (Note: the trail to the top of Bishop Peak was not in existence at the time of purchase and is therefore not covered by this condition). No access points other than the three agreed to under the '*Easement and Boundary Maintenance Agreement*' will be permitted.

### 1.4 Plants & Wildlife

The rocky soils derived from volcanic parent material have been undisturbed for a long time, and have retained their original vegetation in pristine form. Many woody plants are found in

BPNR that are not found on the finer surrounding soils. Common vegetation types on the Reserve include oak woodland, grassland, coastal sage scrub, and chaparral. The most prominent tree species on the mountain are coast live oak and California bay, with an occasional sycamore indicating the site of a spring or seep. Beneath the oaks is the ubiquitous poison oak, the most common shrub found on the peak. Together with California blackberry, this woodland understory creates some of the best wildlife habitat in the area. Common species of coastal sage scrub include coyote brush, black sage, monkeyflower, and California sagebrush. These plants are aromatic, with clearly recognizable odors of sage or other minty smells. The hard or true chaparral is generally found more in inland areas and is not so common near the coast. However, in certain areas of Bishop Peak and on the other Morros, chaparral species such as chamise, manzanita, mountain mahogany, toyon and ceanothus can often be found.

The varied plant cover and the existence of steep rocky cliffs provides attractive habitat for a wide variety of birds, mammals, reptiles and other wildlife. Over 200 species of birds are found within the San Luis Obispo area, and perhaps as many as half of these may be found on Bishop Peak. Among the more notable bird species are golden eagles, bald eagles (which are occasionally sighted during the wintertime) hawks, owls, vultures, kestrels and other birds of prey. More commonly seen are the numerous jays, and a wide variety of perching birds.

Deer are fairly common on the peak, and foxes, coyotes, bobcats and even mountain lions are occasionally encountered. At night, raccoons and opossums can often be seen around the base of the mountain or moving into urban areas from the cover provided by the dense brush of the mountain.

With the 2015 Update, a recent biological survey was completed by Terra Verde Environmental Consulting and their findings are included in Appendix 2.

### **1.5 Access**

**Highland Drive:** - Parking: Use existing Street Parking only, no additional off street parking allowed  
Pedestrian Traffic Only, Dogs on Leash, No Bikes, or Horses

**Patricia Ave:** - Parking: Use existing Street Parking only, no additional off street parking allowed  
Pedestrian Traffic Only, Dogs on Leash, No Bikes, or Horses  
Maintenance of Water Tank, Emergency services, and maintenance of trails as required.

**Foothill Blvd:** - Not a formal access point but is used heavily by the public  
Work with Land owner to help redirect them to official access points on Highland and Patricia Drives. An opportunity for formal parking exists if adjacent property is annexed and developed in accordance with the Land Use and Circulation Element adopted in 2014 (See Program 8.15).

**Bishop Peak Ranch Northern Gate:** - Not open to public. Access for Bishop Peak Ranch only, horses, pedestrian Emergency Services, maintenance

**Bishop Peak Ranch Southern Gate:** - Not open to public. Access for movement of cattle only, pedestrian Emergency Services, maintenance

**Bishop Peak Ranch Middle Gate:** - Not open to public. Access for movement of cattle only, pedestrian Emergency Services, maintenance.

**Highway 1 Gate:** - Emergency services access only, and access for cattle.

The reader is referred to the trail guide in Appendix C for details on the trail system and designated access points.

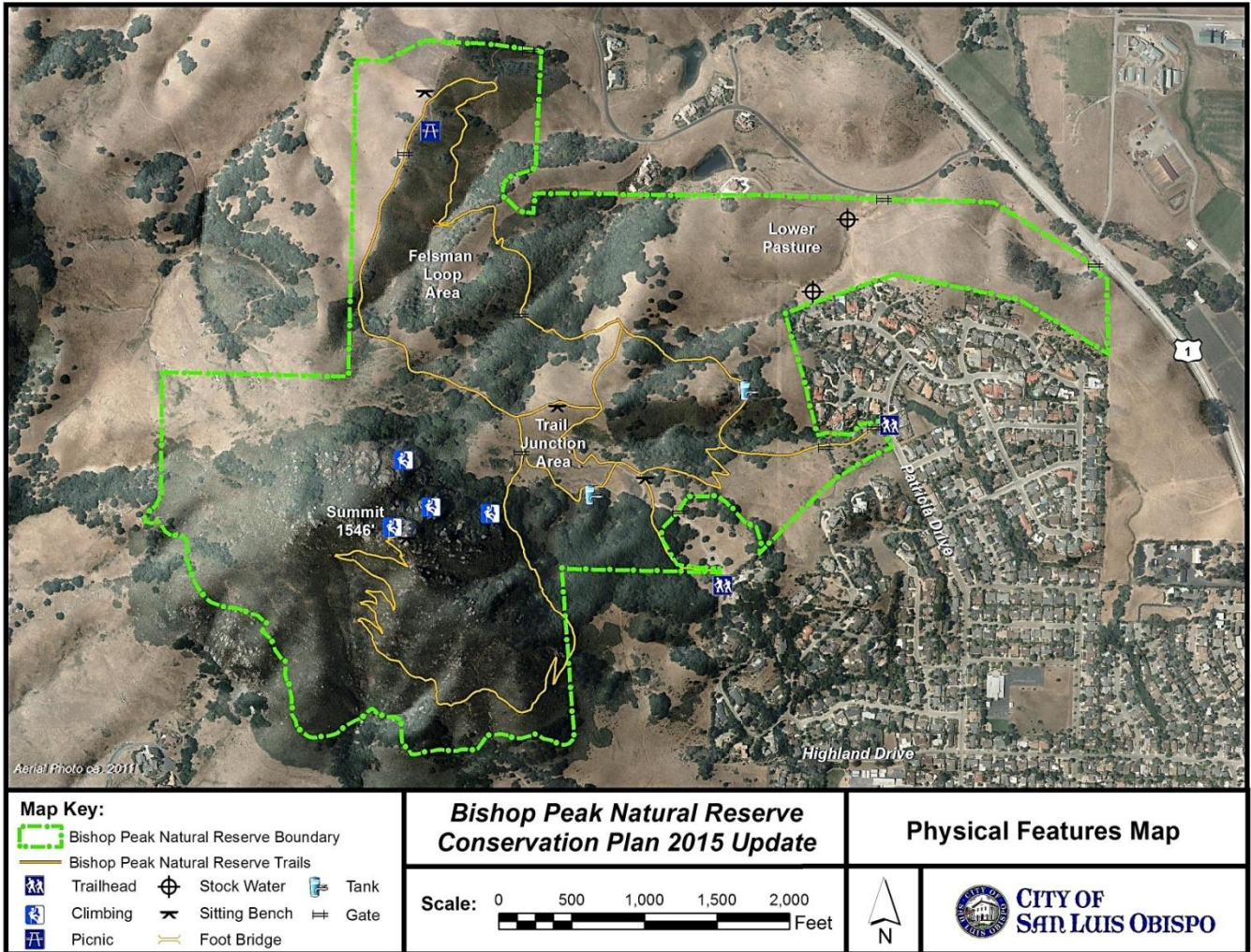
## **2. Inventory**

### *2.1 Physical Features*

The Reserve consists of the distinctive 1546 ft three-pointed peak to the southwest, with areas of chaparral and grassland below 800ft lying to the north and east (Figure 2).

Physical changes to the landscape resulting from past and present human activities within BPNR include: 4.1 miles of established trail system; two water tanks; seven established rock climbing areas; two authorized access points at Patricia Drive and Highland Drive. Natural physical features include the 1546ft peak, and a small seasonal pond in the foothills east of the peak (see Figure 3).

Soils - Survey maps indicate that seven soil types are represented on BRNR (Figure 4). They are primarily dacite rock outcrops (63.25 acres), Lodo shale/clay loams (88.46 acres), Diablo complex soils (78.82 acres), and Gaviota fine sandy loams (63.50 acres). Smaller areas of Briones (20.75 acres), Los Osos (16.31 acres) and Salinas (2.72) soils are also present (see Appendix 1 for detailed soil descriptions).



**2.2 Cultural/Historic Features**

A rich and diverse assemblage of cultural and historic resources are present within the BPNR. Eleven separate cultural resources have been identified ranging in age from recent historic to prehistoric, possibly in excess of several thousand years. A report detailing the specifics of each site and its location has been prepared (Betrand and Betrand, 1997), a copy of which is available from the City of San Luis Obispo only by written request.

**2.3 Biological Features**As part of the 2015 update, a new biological inventory was completed by Terra Verde Environmental Consulting and the complete list of plants and wildlife they observed is included in Appendix 2. They documented 9 different plant communities, and recorded a total of 201 plant and 54 wildlife species. Of those, one plant community, two plant species and 7

**wildlife species are considered special-status.** Terra Verde Environmental identified many of the same species that were present in 2004, as well as some new ones, while others were not present during the current survey. It is assumed that suitable habitat is still present for those species that were not present during the current survey; accordingly both the prior survey work, below, and the current survey work are included with the 2015 Update.

BPNR encompasses a mosaic of woodland, grassland, and scrub habitats that encircle Bishop Peak and extend upward to merge with its rocky facade. These natural communities support a diverse assemblage of plants and animals. Wildlife surveys of BPNR were conducted between November 2002 and June 2003. Representative areas of scrub, live oak woodland, and grassland habitats were sampled using standard survey methods.

A variety of bird, mammal, reptile, amphibian, and invertebrate species were observed or detected during the surveys. Dense undergrowth of poison oak (*Toxicodendron diversilobum*) and/or thick scrub vegetation limited the areas above 800 feet in elevation that were accessible for surveying. Wildlife observations in these areas were made from footpaths and game trails. The detailed wildlife report in Appendix 2 presents a list of wildlife species identified during surveys and those described as occurring within or directly adjacent to BPNR in a report by Ostrowski (1979).

#### **2.4 Dominant Vegetative Communities**

Three broadly defined native vegetative communities are dominant habitat types within BPNR. These include live oak woodland, mixed scrub-chaparral, and grassland habitats. The locations and coverage of each of these communities is shown in Figure 5. Mixed scrub/chaparral habitat and grassland habitat occupy roughly equal areas of BPNR (37 and 36 percent, respectively). Approximately 27 percent of the area within BPNR is occupied by oak woodland habitat. The composition and abundance of dominant species within each community is variable.

Mixed Scrub-Chaparral Habitat - Scrub vegetation occupies nearly 129 acres of BPNR. This community is variable with observed differences likely resulting from differences in soil type, location/exposure, topography, and degree of disturbance (including fire). Scrub habitat recovering from recent brush fires is encountered along a ridge in the northeastern region of BPNR. Although the species composition, abundance, and density/height of the community varies, the dominant vegetative components within scrub-chaparral habitats generally include:

- California sagebrush (*Artemisia californica*)
- Black sage (*Salvia mellifera*)
- Coyote brush (*Baccharis pilularis*)
- Chamise (*Adenostoma fasciculatum*)
- Toyon (*Heteromeles arbutifolia*)
- Coast live oak (*Quercus agrifolia*)
- Deerweed (*Lotus scoparius*)

- Poison oak (*Toxicodendron diversilobum*)
- Monkeyflower (*Mimulus aurantiacus*)
- Wedgeleaf ceanothus/buck brush (*Ceanothus cuneatus* var. *cuneatus*)
- Wild buckwheat (*Eriogonum fasciculatum*)

A variety of less common flowering plants and shrubs were found during surveys of the scrub/chaparral habitat. These include fuchsia-flowered gooseberry (*Ribes speciosum*), Indian paintbrush (*Castilleja* sp.), morning glory (*Calystegia* sp.), blue dicks (*Dichelostemma pulchella*), goldenrod (*Solidago occidentalis*), and coast tassel bush (*Garrya elliptica*).

Coast Live Oak Woodland Habitat - Areas identified as coast live oak woodland occupy approximately 97 acres of BPNR and are present on many of the north and east facing hillsides and swales. Oak woodland habitat also extends up into the Reserve along a few of the drainage swales located on the scrub-chaparral dominated southern exposure of Bishop Peak. As with scrub-chaparral habitats, the species composition, density, and height of the coast live oak community is variable. Generally, coast live oak woodland along the eastern and northern exposures of the peak is dominated by a mixed coast live oak/California bay-laurel community. A mixed coast live oak/toyon community vegetates southern exposures and the drier (upper) areas within drainage swales. The dominant species identified within coast live oak woodland include:

- Coast live oak (*Quercus agrifolia*)
- California bay-laurel (*Umbellularia californica*)
- Toyon (*Heteromeles arbutifolia*)
- Poison Oak (*Toxicodendron diversilobum*)
- Coffeeberry (*Rhamnus californica*)
- Sycamore (*Platanus racemosa*)
- Monkeyflower (*Mimulus aurantiacus*)
- Blackberry (*Rubus ursinus*)
- Wood fern (*Dryopteris arguta*)
- Blue elderberry (*Sambucus mexicana*)

Understory vegetation is generally sparse beneath the oak canopy but includes poison oak, blackberry, monkeyflower, ferns, and grasses. Fuchsia-flowered gooseberry, hummingbird sage (*Salvia spathacea*), and shooting stars (*Dodecatheon* spp.) are among the flowering plants encountered in oak woodland habitats.

Grassland Habitat - Grassland habitat occupies a combined area of approximately 126 acres within BPNR. The grasslands consist of a variable mixture of native and non-native grass species, wildflowers, and forbs. Generally, grasslands along the lower slopes appear to be dominated by annual grasses. Purple needlegrass (*Stipa pulchra*) is the most common native grass species in the Reserve and the following species are prevalent:

- Foxtail barley (*Hordeum murinum*)
- Ryegrass (*Lolium multiflorum*)
- Common wild oats (*Avena fatua*)
- Ripgut brome (*Bromus diandrus*)
- Hummingbird sage (*Salvia spathacea*)
- Mustard (*Brassica nigra*)

- Wild rose (*Rosa californica*)

A variety of native wildflowers are observed blooming in grassland areas. These include buttercup (*Ranunculus californicus*), Goldenstar (*Bloomeriacrocea*), soap plant (*Chlorogalum pomeridanum*), mariposa lily (*Calochortus spp.*), California poppy (*Eschscholzia californica*), chocolate lilies (*Fritillaria biflora*), and blue dicks (*Dichelostemma capitatum*).

## 2.5 Wildlife Survey

The three broad habitat types identified within BPNR support a diversity of wildlife species. Most of the species observed or detected during wildlife surveys are relatively common inhabitants of scrub-chaparral, oak woodland, and grassland habitat however, five special-status wildlife species were encountered. These included the Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), and San Diego desert woodrat (*Neotomalepida intermedia*). Additionally, several species of local concern were encountered during surveys. These included the ringneck snake (*Diadophis punctataus*), western skink (*Eumeces skiltonianus*), yellow-rumped warbler (*Dendroica coronata*), Olive-sided flycatcher (*Contopus borealis*), greater roadrunner (*Geococcyx californianus*), rufous-crowned sparrow (*Aimophila ruficeps*), and monarch butterfly (*Danaus plexippus*). A summary of the wildlife species identified is presented in the following section.

**Birds** - The varied habitats within BPNR offer food, shelter, and roosting/nesting sites for a wide variety of bird species. A total of 55 bird species were identified during surveys including three special status species. Table 1 presents a list of the bird species identified. Undoubtedly many more resident and migratory bird species would be detected with a more extensive seasonal sampling effort.

A Cooper's hawk was observed on two occasions, once in oak woodland habitat near the Highland Drive access trail and once in an oak woodland area near the northern extent of the Reserve. On both occasions the hawk appeared to be hunting. A white-tailed kite was observed in both grassland (perching and foraging) and oak woodland (perching) habitats in the northeastern region of BPNR on several occasions. Nesting white-tailed kites and Cooper's hawks are listed in the CNDDDB as fully protected in California and as migratory non-game birds of management concern by the United States Fish and Wildlife Service (USFWS). Another federal and state special concern species, the loggerhead shrike, has been observed in BPNR in recent years. A single loggerhead shrike was sighted in a sycamore tree near Highway 1 (across from Stenner Creek Road) in 2000. Additionally, BPNR supports a variety of warblers, wrens, vireos, flycatchers, and native sparrows that are considered local species of concern.

**Table 1. List of birds identified during 2004 wildlife surveys of BPNR showing habitats in which the species were observed.**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Scrub and Chaparral</b>	<b>Live Oak Woodland</b>	<b>Grassland</b>
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<i>Accipiter cooperii</i>	Cooper's hawk		√	
<i>Aeronautessaxatalis</i>	White-throated swift	√	√	
<i>Aimophilaruficeps</i>	Rufous-crowned sparrow	√		
<i>Anasplatyrhynchos</i>	Mallard		in stock pond	
<i>Aphelocomacalifornica</i>	Western scrub-jay	√	√	
<i>Buteolineatus</i>	Red-shouldered hawk		√	
<i>Buteojamaicensis</i>	Red-tailed hawk	√	√	√
<i>Callipeplacalifornica</i>	California quail	√	√	
<i>Catherpesmexicanus</i>	Canyon wren	√		
<i>Calypteanna</i>	Anna's hummingbird	√		
<i>Carduelistristis</i>	American goldfinch	√		
<i>Carpodacumexicanus</i>	House finch	√		√
<i>Cathartes aura</i>	Turkey vulture	√		
<i>Catharusustulatus</i>	Swainson's thrush	√	√	
<i>Chamaeafasciata</i>	Wrentit	√		
<i>Chondestesgrammacus</i>	Lark sparrow	√		
<i>Colaptesauratus</i>	Northern flicker		√	
<i>Columba livia</i>	Rock dove (pigeon)		√	
<i>Contopus borealis</i>	Olive-sided flycatcher	√		
<i>Corvusbrachyrhynchos</i>	American crow		√	√
<i>Dendroicacoronata</i>	Yellow-rumped warbler		√	
<i>Dendroicatownsendi</i>	Townsend's warbler		√	
<i>Elanusleucurus</i>	White-tailed kite	√	√	√
<i>Euphaguscyanocephalus</i>	Brewer's blackbird			√
<i>Falco sparverius</i>	American kestrel		√	√

<i>Geococcyxcalifornianus</i>	Greater roadrunner	√		
<i>Hirundopyrrhonta</i>	Cliff swallow			√
<i>Junco hyemalis</i>	Dark-eyed junco	√	√	
<i>Laniusludovicianus</i>	Loggerhead shrike			√
<i>Meleagrisgallopavo</i>	Wild turkey			√
<i>Mimuspolyglottis</i>	Northern mockingbird	√	√	
<i>Parusinornatus</i>	Plain (oak) titmouse	√		
<i>Parusrufescens</i>	Chestnut-backed chickadee		√	
<i>Phalaenoptilusnuttalii</i>	Common poorwill			√
<i>Picoidesvillosus</i>	Hairy woodpecker		√	
<i>Pipilocrissalis</i>	California towhee	√	√	
<i>Pipiloerythrophthalmus</i>	Spotted towhee	√	√	
<i>Poliophtilacaerulea</i>	Blue-gray gnatcatcher	√		
<i>Psaltriparusminimus</i>	Bushtit	√	√	
<i>Regulus calendula</i>	Ruby-crowned kinglet		√	
<i>Sialiamexicana</i>	Western bluebird		√	√
<i>Sayornisnigricans</i>	Black phoebe	√	√	
<i>Selasphorussasin</i>	Allen's hummingbird	√		
<i>Spizellapasserina</i>	Chipping sparrow	√		√
<i>Sterna sp.</i>	U.I. tern			
<i>Sturnellaneglecta</i>	Western meadowlark			√
<i>Thryomanesbewickii</i>	Bewick's wren		√	
<i>Toxostomaredivivum</i>	California thrasher	√		
<i>Turdusmigratorius</i>	American robin			√
<i>Tyto alba</i>	Barn owl		√	

<i>Vireo huttoni</i>	Hutton's vireo		√	
<i>Vermivoracelata</i>	Orange-crowned warbler	√	√	
<i>Zenaidamacroua</i>	Mourning dove	√		√
<i>Zonotrichiaatricapilla</i>	Golden-crowned sparrow	√	√	√
<i>Zonotrichialeucophrys</i>	White-crowned sparrow	√		√

**Mammals** - A total of seventeen mammal species were observed during wildlife surveys (Table 2). Scrub/chaparral habitats appeared to support the greatest diversity of mammal species. Mule deer (*Odocoileus hemionus*) were encountered in each of the habitat types sampled and woodrat nests were common in chaparral and oak woodland areas. Two species of woodrat, the dusky-footed woodrat (*Neotomafuscipes macrotis*) and the San Diego desert woodrat, were identified in BPNR during small mammal trapping efforts. The San Diego desert woodrat is a federal and state species of special concern. Positive identification of the sub-species of dusky-footed woodrat encountered on Bishop Peak was not determined, however, it is not believed to be a special concern species. Bishop Peak is situated several miles to the southeast of the described range of the Monterey dusky-footed woodrat, which is a special concern species.

**Bats** - (Order Chiroptera) were detected by sound in a rock crevice near the top of Bishop Peak, however, their taxa could not be determined. Numerous rock crevices suitable for roosting bats are present in BPNR as well as an abundant prey base for special status species such as the pallid bat (*Antrozous pallidus*). **With the updated biological surveys completed, Terra Verde biologists deployed a Petterson D500x bat detector with the acoustic calls analyzed with SonoBat US West (Szewczak) and validated the presence of not only the special status pallid bat but also recorded Townsend's big-eared bat (*Corynorhinus townsendii*) calls. Hoary bat (*Lasiurus cinereus*) calls were also recorded and they are listed as a High Priority for protection through the Western Bat Working Group.**

**Table 2.2004 List of mammals identified during wildlife surveys of BPNR showing habitats in which the species were observed or detected.**

Scientific Name	Common Name	Scrub and Chaparral	Live Oak Woodland	Grassland
<i>Canis latrans</i>	Coyote	√		√
Order Chiroptera	Bat	√		
<i>Didelphis marsupialis</i>	Opossum		√	
<i>Peromyscus boyleyi</i>	Brush mouse	√	√	
<i>Peromyscus californicus</i>	California mouse	√		

<i>Peromyscus maniculatus</i>	Deer mouse	√	√	
<i>Procyon lotor</i>	Raccoon		√	
<i>Mephitis mephitis</i>	Striped skunk	√		
<i>Microtus californicus</i>	California meadow mouse	√		√
<i>Neotoma fuscipes macrotis</i>	Dusky-footed woodrat	√	√	
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	√	√	
<i>Odocoileus herionus</i>	Mule deer	√	√	√
<i>Sciurus griseus</i>	Western gray squirrel		√	
<i>Spermophilus beecheyi</i>	California ground squirrel			√
<i>Sylvilagus bachmani</i>	Brush rabbit	√		
<i>Thomomys bottae</i>	Botta's pocket gopher	√		√
<i>Urocyon cinereoargenteus</i>	Gray fox	√	√	

Reptiles- Five reptile species were encountered during wildlife surveys including two species of local concern; the ringneck snake and the western skink. The reptile species identified during the survey are listed in Table 3. The western fence lizard (*Sceloporus occidentalis*) was the most commonly encountered reptile and was present in all of the surveyed habitat types. Western skink appeared to be relatively abundant in grassland areas on the eastern and northern exposures of the peak.

**Table 3.2004 List of reptiles identified during wildlife surveys of BPNR showing habitats in which the species were observed.**

Scientific Name	Common Name	Scrub and Chaparral	Live Oak Woodland	Grassland
<i>Diadophis punctataus</i>	Ringneck snake		√	√
<i>Elgaria multicarinatus</i>	Southern alligator lizard			√
<i>Eumeces skiltonianus</i>	Western skink			√

<i>Pituophismelanoleucus</i>	Gopher snake			√
<i>Sceloporusoccidentalis</i>	Western fence lizard	√	√	√

Amphibians - Two amphibian species, the Pacific tree frog (*Hylaregilla*) and the California slender salamander (*Batrachosepsattenuatus*) were encountered during surveys. Both species were encountered in greatest abundance in grassland areas, although they were also observed in oak woodland habitat. Pacific tree frog larvae and juveniles were present in the stock pond near the Highland Drive access point and in ephemeral pools associated with two of the larger watercourses that drain the northern areas of the peak.

Invertebrates - A variety of invertebrates were identified during surveys including the Big Sur shoulderband snail (*Helminthoglyptaumbilicata*). A number of live Big Sur shoulderband snails, as well as empty shells, were found during surveys.

**Table 4.2004 List of invertebrates identified during wildlife surveys of BPNR showing habitats in which the species were observed.**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Scrub and Chaparral</b>	<b>Live Oak Woodland</b>	<b>Grassland</b>
<i>Dananusplexippus</i>	Monarch butterfly	√		
<i>Eleodes</i> sp.	Stink beetle	√		√
<i>Grylluspennsylvanicus</i>	Field cricket	√		√
<i>Helix aspersa</i>	European garden snail			√
<b><i>Helminthoglyptaumbilicata</i></b>	Big Sur shoulderband snail			√
<i>Latrodectusmactans</i>	Black widow spider			√
<i>Lygaeuskalmii</i>	Common milkweed bug	√		√
<i>Nymphalisanthropia</i>	Mourning-cloak butterfly	√		
<i>Stenoplematusfuscus</i>	Jerusalem cricket			√
<i>Vespulasp.</i>	Yellow jacket			√

Other invertebrates noted during surveys include various butterflies, bees, centipedes, millipedes, spiders, crickets, scorpions, and several ant species. Monarch butterflies were observed within the Reserve, however, no over-wintering sites were identified during surveys.

## Goals & Recommendations

Goals 3.1-3.4 will be achieved by the identification and appropriate management of land use designations within BPNR as described in "Conservation Guidelines for Open Space Lands of the City of San Luis Obispo". Land use designations for BPNR are shown on the system map in Figure 7. The goals relevant to BPNR are:

- 3.1 To conserve, enhance, and restore natural plant communities; to protect sensitive and endangered plant species and their habitats; and to maintain biodiversity of native plants and animals.
- 3.2 To provide the public with a safe and pleasing natural environment in which to pursue passive recreational activities, while maintaining the integrity of the resource and minimizing the impact on the wildlife and habitats represented.
- 3.3 To preserve and restore creeks, wetlands and ephemeral seeps or springs in a natural state, and provide suitable habitat to all native aquatic and riparian species. To minimize the impacts of harmful activities, such as the release of pollutants, while maintaining the creek system as a means of conveying storm water within urban areas.
- 3.4 To conserve and protect native plant and animal species and enhance their habitats, in order to maintain viable wildlife populations within balanced ecosystems.

The Open Space Element of the General Plan has been updated since implementation of the 2004 Bishop Peak Natural Reserve Conservation Plan and is now called the Conservation and Open Space Element (2006). Because the Conservation Guidelines are based on the previous Open Space Element, relevant goals of the current, 2006 Conservation and Open Space Element are included below to provide further guidance. The changes most relevant to BPNR are:

1. Monitoring programs for air and water quality, and for natural populations
  2. Passive recreational uses of open space where compatible with other natural resource and neighborhood compatibility objectives
  3. Exterior lighting design standards to prevent light pollution and preserve nighttime sky views
  4. Increased emphasis on preservation of the Morros
  5. Revised greenbelt boundary to expand open space buffers around the City and more closely reflect natural viewsheds, watersheds and geographic features like valleys, ridgelines and peaks
- 3.5 Sustainable Natural Populations (7.2) The city will maintain and enhance conditions necessary to enable a species to become self-sustaining. Within the San Luis Obispo planning

area, the City will seek to achieve self-sustaining populations of the plants, fish and wildlife that made up the natural communities in the area when urbanization began.

3.6 Trees and other plants. (7.4) Protect, preserve and create the conditions that will promote the preservation of significant trees and other vegetation, particularly native California species.

3.7 Greenbelt. Open space outside the urban area. Secure and maintain a healthy and attractive Greenbelt around the urban area, comprised of diverse and connected.

3.8 Open spaces access and restoration. (8.4.2) The city intends to allow public access to open space that fosters knowledge and appreciation of open space resources without harming them and without exposing the public to unacceptable risk. The main goal is to protect open space and wildlife habitat, with a secondary goal of providing passive recreation where it will not harm the environment.

3.9 Passive Recreation. (8.5.5) The City will consider allowing passive recreation where it will not degrade or significantly impact open spaces resources and where there are no significant neighborhood compatibility impacts, in accordance with an approved open space conservation plan. Passive recreation activities may include: hiking, nature study, bicycle use, rock climbing, horseback riding or other passive recreational activities as permitted and regulated in the Open Space Ordinance.

3.10 Determination of appropriate uses for City-owned open space. (8.5.6) Determination of the appropriate land management practices and the recreational uses of City-owned open space lands shall be made on an area-specific basis, based upon the policies in the Conservation and Open Space Element, the Open Space Ordinance (SLOMC 12.22), and the adopted "Conservation Guidelines for

City-Owned Open Space Lands." These policies will be applied through the public planning and review

process specified in the Conservation Guidelines, and will guide the preparation and adoption of conservation plans for City-owned open space properties.

This Conservation Plan also aims to accommodate the desires and wishes of the general public for BPNR, as well as addressing the general goals of the City's Conservation and Open Space Element. The points detailed below are a result of input solicited from members of the public during workshops and other public meetings held in 2003 which led to the adoption of the Bishop Peak Natural Reserve Conservation Plan in 2004.

3.5 Wildlife habitat enhancements should be implemented whenever possible (enhancement to California quail habitat was specifically identified as requiring attention as local residents have noticed a reduction in quail numbers on the property in recent years).

3.6 Habitat information guides should be prepared informing local residents and users of the characteristics of the wildlife and habitats represented in BPNR, and measures that can

- be taken to preserve wildlife and habitat. A webpage dedicated to BPNR was agreed to be a suitable medium for the dissemination of this information.
- 3.7 The current ban on mountain biking on BPNR should be retained.
  - 3.8 The City should encourage CalPoly University to address problems associated with the sports complex lights. There are concerns that the complex is currently a source of light pollution for BPNR.
  - 3.9 The area of BPNR designated as 'Habitat' during the land use designation process should be maximized.
  - 3.10 The City should explore methods of 'people management' (i.e. changes in user behavior) in addressing impacts to resources resulting from over use of BPNR.
  - 3.11 Impacts on viewsheds both of and from BPNR should be avoided (e.g. the use of orange snow fencing to delineate restoration areas should be avoided).
  - 3.12 Both grazing and fire preparedness plans should be prepared for BPNR.
  - 3.13 Fuel management below the peak should be performed routinely. Cattle grazing and prescribed burning were suggested as appropriate means of fuel management.
  - 3.14 Risks to the public from wildfire should be assessed and addressed. Suggestions for risk reduction included the establishment of a helipad close to the peak and the establishment of marked and maintained 'wildfire refuge areas'.
  - 3.15 The prospect of armoring (by paving or other means) trails as a means of keeping users on designated trails should be explored as a means of addressing the erosion problems caused by bootleg trails, trail braiding and switchback cutting (the public response in 2004 to this suggestion was mixed with proponents for and against the idea).
  - 3.16 Public support for addressing scenic problems associated with the 'P' which was painted on the rock face.
  - 3.17 Photo-points should be established within the first year of implementation of the Conservation Plan to get a 'baseline' for resource condition as soon as possible.
  - 3.18 Further outreach efforts should be made to CalPoly University to help with restoration efforts on BPNR and to educate students on proper conduct while using the Reserve.
  - 3.19 Maintenance of the scenic quality of resources at the pond area should be preserved.
  - 3.20 The City should be more diligent in management of brush on BPNR, this could cause a fire hazard.
  - 3.21 Use of BPNR during hours of darkness should be discouraged due to issues with vandalism and potential for fires.
  - 3.22 Vegetation along Highland Drive should be trimmed, this may have traffic safety implications due to a reduction in visibility resulting from overhanging vegetation. Suggestion to widen Highland drive to address parking issues associated with BPNR.



- 3.23 More Ranger staff hours should be added to manage the heavy user load on BPNR.
- 3.24 Rock climbing activities on BPNR should not interfere with raptor or bat nesting. Impacts on lichens and vegetation at access points to climbing routes should also be monitored.
- 3.25 There should be no increase in the current level of horse traffic in BPNR due to the detrimental impact of heavy use on the resource.
- 3.26 In grazing plans prepared for BPNR recovery of young oak trees and rare plants should be identified as an objective of grazing.
- 3.27 The establishment of a connection road across the site for emergency and maintenance access that will eliminate the requirement for access through the Brittany Court development at the end of Highland Drive should be considered.

#### 4. Conservation Plan

The Conservation Plan describes how the City and County of San Luis Obispo intend to manage BPNR to fulfill adopted goals and recommendations of the community for the property. The land use designations proposed for BPNR are shown on the system map (Figure 7). The general day-to-day management of these areas will be in accordance with direction in the City-adopted document “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*”. The Conservation Plan also describes a series of tasks that will be implemented in order to achieve more specific goals and recommendations.

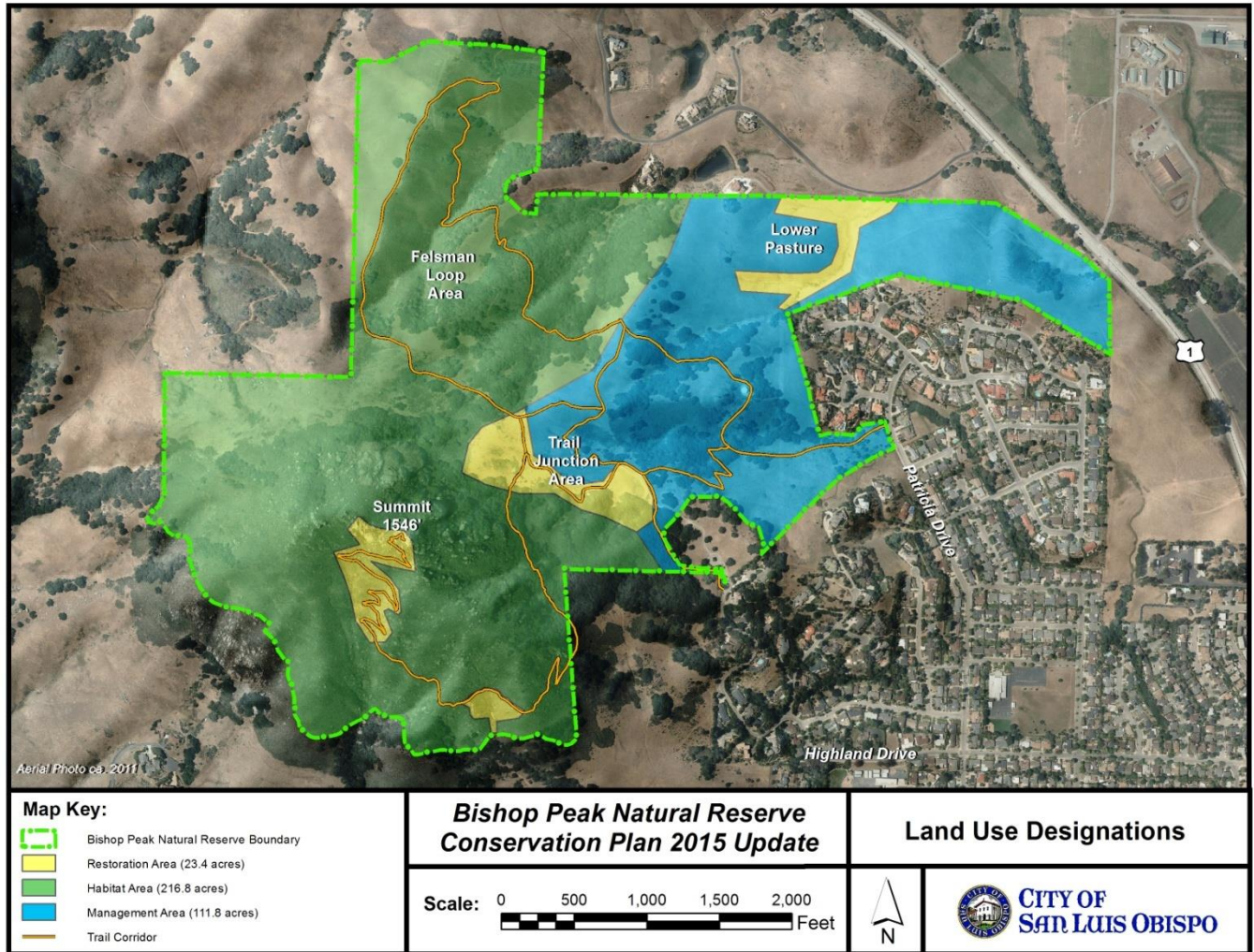
##### 4.1 System Map

The land use designations proposed for BPNR are shown in Figure 7. Three designations are represented:

	<u>2004</u>		<u>2015</u>	
Habitat	225acres	64%	216.8	61.6%
Management/Trail Corridor	110acres	30%	111.8	31.8%
Restoration	<u>20acres</u>	<u>6%</u>	<u>23.4</u>	<u>6.6%</u>
TOTAL	355 acres	100%	352 acres	100%

(The ‘Agricultural’ and ‘Cultural/Historic’ designations are not represented within the boundaries of BPNR)

In keeping with the City/County commitment to the conservation of native wildlife and vegetation, 61.6% of BPNR has been designated as 'Habitat'; this figure has decreased slightly as additional restoration project areas near the Summit and Trail Junction area have been identified for the 2015 Update.



#### 4.2 Needs Analysis

The following tasks will continue to be undertaken over the next 7-10 years to accomplish goals that are not yet complete and address the recommendations described in Section 3.

To achieve goals 3.1-3.4 BPNR will be managed in accordance with City-adopted policies described in "Conservation Guidelines for Open Space Lands of the City of San Luis Obispo". The reader is referred to this document for specific details of how these policies relate to land use designations identified on the system map (Figure 4), and an explanation of how policies are identified in the following discussion (e.g. LV7; HA12etc).

Many of the policies described in “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*” are designed to be protective of City-owned resources by restricting activities that may have a negative impact (e.g. prohibition of trail construction in ‘Habitat’ areas [HA12]). Providing such limitations are observed, implementation of restrictions is primarily a passive affair requiring no active management or changes in prevailing conditions or activities. However, other recommendations do require active management and will result in changes in management practices or altered resource conditions. These are:

(Note: The specific goal or recommendation identified in Section 3 that is addressed by the proposed action is given in parentheses)

- 4.2.1 Restoration of wildlife habitat is considered an integral part of management, maintenance, and restoration of all City-owned open spaces. Habitat enhancements will be implemented as opportunities and funding arise. Special grant funding will be sought for habitat enhancement projects (3.5).
- 4.2.2 A ban on mountain biking is a legally binding condition of some of the parcels and the high usage by foot traffic makes it unsafe, prohibits a combined use, therefore the City/County shall continue to enforce the current ban on mountain biking in the Reserve (3.7).
- 4.2.3 The City’s Conservation and Open Space Element has as “Its overarching goal to protect resources (such as air and water, wildlife habitat, scenic... lands, watershed and historic features) with a secondary goal of accommodating passive recreation where it will not harm the environment...”This shall be achieved by maximization of the area designated as ‘Habitat’ within BPNR (3.9).
- 4.2.4 City-adopted policy relating to the protection of viewsheds on City-owned open space is described by item HA12 in the document “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*” (3.11; 3.19).
- 4.2.5 City-adopted policy relating to the development of grazing and wildfire management plans is described by items LV1 and LV9 in the document “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*” (3.12; 3.20).
- 4.2.6 City-adopted policy relating to the management of vegetative fuel on City-owned open spaces is described by items LV8 and LV9 in the document “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*” (3.13; 3.20).
- 4.2.7 The City of San Luis Obispo Municipal Code, item 12.22.050B states: ‘*Presence in Open Space Lands Restricted to Certain Hours - No Overnight Usage. Open space lands where public access is permitted shall be open to the public from dawn to dusk. It shall be unlawful to enter or remain within such lands between one hour after sunset and one hour before sunrise of the following day without approval from the director*’. Presence in BPNR outside of stated hours of use is a violation of this regulation, and enforcement is a matter for the City’s Police Department (3.21).

- 4.2.8 The City-adopted policy relating to the closure of rock climbing routes on City-owned open spaces is described by item HA9 in the document "*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*" (3.24).
- 4.2.9 Horses boarded at the stables on the former Bunnell property have a legal right of use of the trails on the portion of the Reserve purchased from Ray Bunnell (i.e. shaded area figure ##) . No other stable has rights to use the property, nor is there indication that horse traffic from the Bunnell stable will increase significantly above its present level. The City does not anticipate that the level of horse traffic using BPNR will increase significantly within the timeframe of this Conservation Plan (3.25).
- 4.2.10 The grazing plan for BPNR is described in Section 6 (3.26).
- 4.2.11 The letter 'P' painted on the east-facing slope of Bishop Peak during the 1960's is viewed as an eyesore by some local residents. However, others believe that it is now a part of the community's character and heritage. The City and County have explored the possibility of removing this graffiti with local rock climbers. There have been previous attempts to remove/alter it which were unsuccessful, including an ill fated attempt to haul up a compressor/sandblaster. From a safety perspective, removal of the graffiti would be a very dangerous task. Sandblasting would probably be the only viable means of removal. The compressor would have to be carried up to the summit with a gas-powered generator to run it. The work would have to be performed from the top down using ropes and harnesses. There are no commercial/heavy duty anchors above the 'P' to anchor from and a contractor would have to create his own anchor system. Due to the technical and dangerous nature of the process the prospect of a local climber volunteering to perform this task is low (3.16).
- 4.2.12 The City and County of San Luis Obispo have jointly published an information leaflet entitled "Bishop Peak Natural Reserve" (Appendix 3), this outlines rules of use of the Reserve and gives information on history, biology and geology. This information will be supplemented by the creation of a webpage dedicated to BPNR on which more detailed up-to-date information can be posted (3.6).
- 4.2.13 The City and County of San Luis Obispo will work with CalPoly to address problems relating to lighting from sports complex disturbing wildlife on BPNR (3.8).
- 4.2.14 BPNR is the most heavily used open space in the area and regular ranger patrols are essential to minimize user behavior that is detrimental to the resource. At present the City of San Luis Obispo commits approximately 500 man-hours annually to patrol/maintenance of BPNR, with an additional 150 hours being supplied by the County. As funding resources become available patrol hours should be increased to a minimum of 1000 man-hours annually (3.10; 3.23); with up to 1/3 of this labor being provided by the County.
- 4.2.15 The establishment of a helipad close to the peak has been investigated and was deemed to be infeasible due to the lack of a suitable location. However, the City and County in coordination with the City Fire Department and CDF will explore the feasibility of establishing signposted 'wildfire refuge zones' within BPNR (3.14).
- 4.2.16 Paving (hardscaping) of the trail may be evaluated as a method to address the user impact induced erosion problems in the pond area when all other reasonable methods (such as exclusion fencing and public education) have been exhausted. If the

evaluation concludes that paving of the area is necessary then all specifications regarding length of trail to be paved, materials used etc, will be identified in the next update of this conservation plan (3.15).

- 4.2.17 Photo-points have been identified (see Section 7) to establish a pictorial record of the status of the resource over time (3.17).
- 4.2.18 The City and County have produced a body of educational materials about BPNR, including: a color brochure, webpage (<http://www.slocity.org/government/department-directory/city-administration/natural-resources/bishop-peak-natural-reserve>), and trailhead signage. It is a concern of the public that the Reserve is not publicized in such a way as to attract large numbers of additional, non-local, tourists to an already heavily used resource. City Natural Resources staff are of the opinion that most of the information currently available strikes the appropriate balance between public education and active promotion of the Reserve, but will remain active in ensuring that tourism publicity through media outlets and advertising is eliminated.

Further efforts will be made to educate CalPoly students about responsible use of the Reserve. Campus media outlets such as the 'Mustang Daily' will be utilized for this process whenever possible (3.18).

- 4.2.19 The vegetation that overhangs Highland Drive is on private property. The City Arborist and Transportation Operations Manager will assess if this vegetation poses a safety risk to motorists using Highland Drive, and if so enforcement action may be taken to address the problem (3.22).
- 4.2.20 The development of a continuous emergency/maintenance road traversing BPNR with multiple access points is discussed in the 'Wildfire Preparedness Plan' in Section 6 (3.27).
- 4.2.21 The ongoing program to control infestations of Purple and Yellow Star thistle, and Distaff thistle will continue. The methods of control utilized will, ideally, be in accordance with the Integrated Pest Management (IPM) policy described in item LV12 of the appendix to the document "Conservation Guidelines for Open Space Lands of the City of San Luis Obispo" but the provisions of LV13 and LV14 may be necessary for effective control of these invasive species.
- 4.2.22 City staff will monitor public parking for access to Bishop Peak Natural Reserve at the Highland Avenue and Patricia Drive accesses. Problems or complaints continue to be raised by the adjacent neighborhoods, and staff has advised the neighborhoods about the City's parking permit district program and of other potential actions which may be pursued to address those concerns. Ongoing traffic studies and discussions with neighbors must occur to reach consensus on appropriate strategies.

### 4.3 Implementation Strategy

The priority and order in which tasks described in Section 4 will be implemented is detailed below. Each task has been designated to staff from the City's Natural Resources Program (NR), Parks and Recreation Department (PR), or other City/County staff. As of Spring, 2015 the current status of each task has been appended to provide clarity for the development and continuity of future management efforts.

<b>Ongoing Tasks</b>	<b>Status as of 2015 Update</b>
Tasks 4.2.1-4.2.11 are general maintenance activities or activities that the City has decided not to implement for the reasons stated. Maintenance activities will be implemented on a regular or 'as needed' basis throughout the next 7-10 years covered by this Conservation Plan Update (NR/PR).	
<b>Specific Tasks</b>	
<b>Years 1-2</b>	
<ul style="list-style-type: none"> <li>• Create a webpage dedicated to BPNR (task 4.11; NR).</li> </ul>	<ul style="list-style-type: none"> <li>• Not yet complete, in development as part of Conservation Plan Update</li> </ul>
<ul style="list-style-type: none"> <li>• Discuss the issue of light pollution from the Cal Poly sports fields with the appropriate university representative (task 4.12; NR/PR).</li> </ul>	<ul style="list-style-type: none"> <li>• Complete</li> </ul>
<ul style="list-style-type: none"> <li>• Establish appropriate photopoints to monitor resource status over time (task 4.17; NR).</li> </ul>	<ul style="list-style-type: none"> <li>• Photopoints established, monitoring ongoing</li> </ul>
<ul style="list-style-type: none"> <li>• Assess the vegetation overhanging Highland Drive as a potential hazard to motorists and take action as appropriate (task 4.19; NR/City Arborist).</li> </ul>	<ul style="list-style-type: none"> <li>• Overhanging vegetation on private property, notices are sent periodically to request trimming by public works department.</li> </ul>
<ul style="list-style-type: none"> <li>• Outreach to CalPoly University using media such as the 'Mustang Daily' newspaper and by attending on-campus environmental awareness fairs (4.18; NR/PR).</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing as part of Week of Welcome to all new Cal Poly students, with additional outreach included in the Open Space work program for 2015-17.</li> </ul>
<ul style="list-style-type: none"> <li>• Develop a continuous emergency access/maintenance road with multiple points of access from the public highway system (task 4.20; NR/PR/County).</li> </ul>	<ul style="list-style-type: none"> <li>• Complete, although access through Brittany Circle is in question at present.</li> </ul>
<ul style="list-style-type: none"> <li>• Assess the feasibility of establishing wildfire refuge areas at the peak. If feasible, clearly signpost these areas (task 4.14; NR/PR/City Fire/CDF).</li> </ul>	<ul style="list-style-type: none"> <li>• Incomplete however conversations with City Fire and Cal Fire are ongoing.</li> </ul>
<b>Years 3-4</b>	
<ul style="list-style-type: none"> <li>• Install educational materials in the form of notice boards or informational booths at the trailhead (task 4.18; NR/PR/County).</li> </ul>	<ul style="list-style-type: none"> <li>• Partially complete.</li> </ul>
<ul style="list-style-type: none"> <li>• Create a two-pasture system to accommodate the modified grazing system as described in the grazing plan (task 4.10; NR. Section 6).</li> </ul>	<ul style="list-style-type: none"> <li>• Complete.</li> </ul>
<b>Years 5-7</b>	
<ul style="list-style-type: none"> <li>• Address the erosion and trail braiding problems currently existing at the pond area where trails originating at Patricia Dr. and Highland Dr. converge. Hardscape the trails</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion and trail braiding problems were successfully addressed above the pond, but new problems in other areas</li> </ul>

in this region if deemed appropriate (task 4.15; NR/PR).	have arisen.
<b>As Funds/Opportunities Become Available</b>	
<ul style="list-style-type: none"> <li>Increase annual Ranger patrol hours at BPNR to 1000 (task 4.14; PR); with up to 1/3 of time being provided by the County of San Luis Obispo.</li> </ul>	City Ranger patrol hours have not met the annual hourly target of 1000 hours, however three new Ranger positions have been approved as part of the 2015-17 financial plan. County rangers provide occasional maintenance activity on the Gnesa parcel.

In addition to continued implementation of those tasks identified above, the following have been identified for additional work with the 2015 Update:

Years 1-2:

- Install new, updated signage at trailheads that provide wayfinding information, Open Space Regulations and associated costs of infractions thereof, and educational / interpretive elements
- Install new, updated signage throughout the trail network to identify official trails, decommissioned trails and climbing specific trails
- Continue monitoring and maintenance of switchbacks on Summit Trail, and implement restoration projects as appropriate (fencing, signage, revegetation, erosion control)
- Install new garbage receptacles at Highland Dr. and Patricia Dr.
- Establish additional new photo monitoring points consistent monitoring protocols for Restoration Areas
- Work with climbing community to identify designated climbing areas and refined management strategies
- Conduct additional research and surveys pertaining to bat populations using the cliffs and caves of the Reserve

Years 3-4:

- Pursue improvements of bootleg trail from Foothill Dr.
- Pursue multi-modal transportation strategies for trailhead access
- Implement lower pasture riparian fencing and restoration project
- Implement stock pond excavation project

#### Ongoing Specific Tasks:

- Continue education and enforcement of Open Space Regulations in the field
- Pro-active education and outreach with Cal Poly and other interested parties
- Monitor ecosystem health
- Monitor trailhead impacts
  
- Explore feasibility of fire, rescue and ranger access improvements
  
- Re-shoot photo monitoring points
  
- Monitor grazing regime, especially in riparian areas
  
- Maintain webpage for BPNR with management bulletin

#### *4.4 Grazing Plan*

Livestock grazing will be permitted on the Ferrini Open Space portion of BPNR.

The Ferrini Open Space was a donation to the City of San Luis Obispo. A condition of the donation was that the donor could continue his traditional use of the site for livestock grazing for continuing ten year periods, unless written notice is provided by the City. The next ten-year period will expire in summer 2015. At the present time the City does not intend to cancel the current tenancy arrangements. However, we will give notice of our intention to implement a new grazing plan as follows:

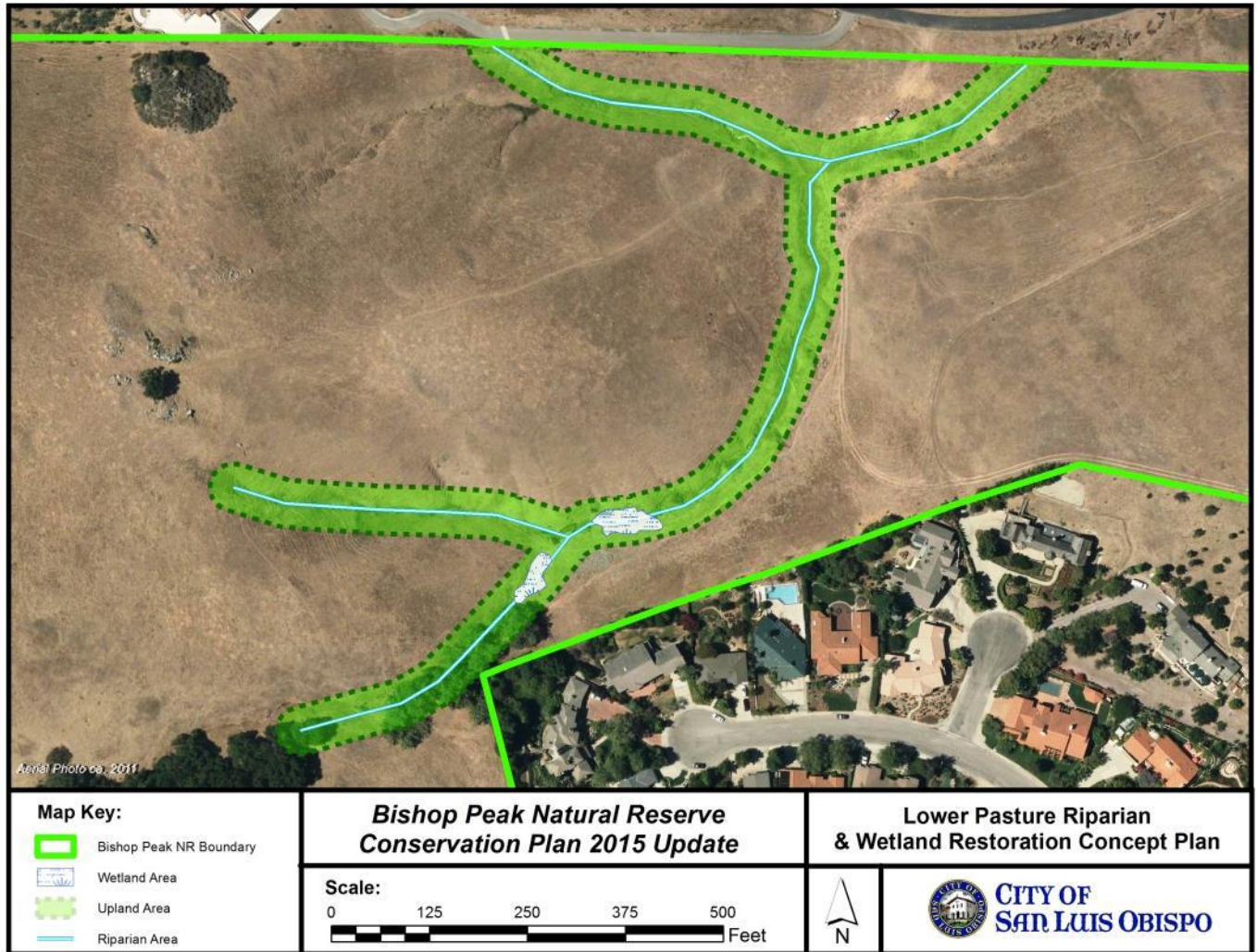
- The area will be divided by fencing into two pastures, lower pasture and upper pasture.
  
- Vegetation management objectives for upper pasture will be to control amount of residual dry matter (RDM) at the end of the growing season to approximately 1,500 pounds per acre. This will be accomplished by permitted livestock grazing from about March 15 to the end or near-end of the growing season (about June 15). Numbers of livestock will be based upon NRCS soils survey data for the area.
  
- Vegetation management objectives for the lower pasture will be to provide fuel reduction to the adjacent residential area, and to control amount of residual dry matter (RDM) at the end of the growing season to approximately 800 pounds per acre, with lower values near the boundary with private developed land, and higher values



elsewhere. This will be accomplished by permitted livestock grazing from about March 15 to the beginning or near-beginning of the following growing season (about November 1). Numbers of livestock will be based upon NRCS soils survey data for the area. Current stocking rates are 14 mother / calf pairs.

- Livestock will not be within BPNR from approximately November 1 to approximately March 15, to allow full establishment of new growth and minimize soil damage from trampling during the winter. Livestock will not be within the upper pasture from approximately June 15 to March 15, to minimize potential conflict with recreational use and to allow full establishment of new growth and minimize soil damage from trampling during the winter.
- The overall acreage currently subject to grazing is about 140 acres; this includes about 40 acres of brush and woodland that is not contributing to the forage resource. About 30 of these acres would be fenced if necessary; however, they are currently only lightly used by livestock and this use would decline under the proposed program. Of the remaining 110 acres, about 30 would be in the lower, more heavily used pasture, and 70 in the upper pasture. RDM at the end of the grazing period under the proposal would be less than currently, and considerably less than currently in the upper pasture, which is estimated at between 600 and 800 pounds per acre at the end of the grazing period.
- Grazing use will be monitored to ensure that management objectives are being met. This will be done through ocular estimates of standing crop biomass, and the establishment and monitoring of permanent transects to estimate species composition within the pastures. A goal of the program will be to maintain native bunchgrasses and forbs, measured as a percent cover by the transect measurements.
- An enclosure will be constructed to control livestock access into the unnamed creek in the lower pasture, and permit revegetation of that feature with willows, oaks and other appropriate vegetation. (See Figure 5, below). The project area is approximately 2,270 linear feet and will feature a 30 foot upland buffer from the thalweg of the stream channel. The planting palette for this restoration project, based on species observation in the immediate vicinity of the project site, is anticipated to be as follows:

<b>Riparian Area</b>	
Arroyo willow	<i>Salix lasiolepis</i>
Bay laurel	<i>Laurusnobilis</i>
Black cottonwood	<i>Populusbalsamifera ssp. trichocarpa</i>
Sycamore	<i>Platanusracemosa</i>
Mugwort	<i>Artemisia douglasiana</i>
<b>Wetland Area</b>	
Rushes spp.	<i>Juncus spp.</i>
Sedges spp.	<i>Carex spp.</i>
Common spikerush	<i>Eleocharismacrostachya</i>
<b>Upland margins</b>	
California sage brush	<i>Artemisia californica</i>
Coffeeberry	<i>Rhamuscalifornica</i>
Coyote brush	<i>Baccharispilularis</i>
Elderberry	<i>Sambucusmexicana</i>
Sticky monkeyflower	<i>Mimulusaurantiacus</i>



Toyon	<i>Heteromelesarbutifolia</i>
Ceanothus spp.	<i>Ceanothus spp.</i>

- The stock pond in the upper pasture will be partially fenced to permit establishment of appropriate vegetation on the banks, while still allowing livestock access to the water. It is recommended that the stock pond be excavated to remove silt that has accumulated over the years in order to provide a more reliable water source at this location, as well as habitat and firefighting benefits.

- The small spring above Anacapa Court will be fenced to preclude livestock access and encourage native vegetation establishment.

#### **4.5 Wildfire Preparedness Plan**

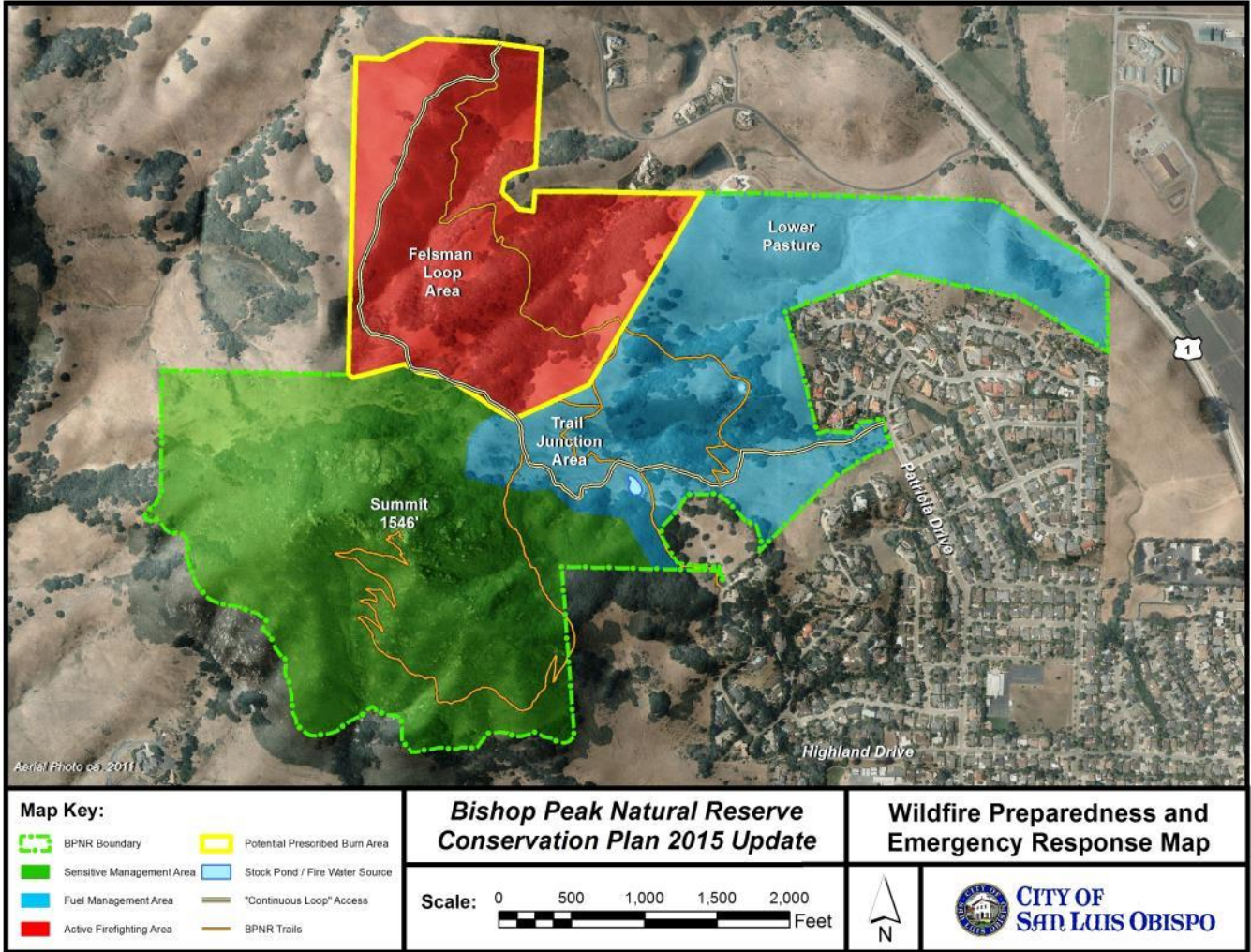
The City document “*Conservation Guidelines for Open Space Lands of the City of San Luis Obispo*” recommends that a Wildfire Preparedness Plan be developed for City open space lands. After consultation with the City’s Fire Department and CDF, five areas have been identified that will receive specific treatment with respect to fighting wildfires and prescribed burning (Figure 6). The process of identification of these areas takes into account a number of factors, including: the topography of the land; proximity to urban developments; vegetation type; and the presence of sensitive species. The areas are:

**Potential prescribed burning area** – areas identified as supporting a high load of vegetative fuel that could be safely reduced by burning under prescribed weather and wind conditions.

**Fuel management area** – areas adjacent to the urban/wildland interface that could not be safely burned in a controlled manner. These areas will require active pruning, mowing and/or other active management of the vegetation (including livestock grazing) to reduce fuel loads adjacent to developed properties.

**Active firefighting area** – areas acting as a buffer between the surrounding urban developments and the pristine habitat lying to the west but still within the BPNR. Active firefighting techniques such as the use of heavy machinery and cutting of fuel breaks can be utilized and property from an advancing wildfire. These areas have also been identified because the physical resources and topography are conducive to successful restoration efforts following a wildfire.

**Passive (habitat sensitive) firefighting area** – areas of important wildlife habitat, mostly on steep hillsides. These areas are also somewhat removed from urban development. They are particularly sensitive to aggressive firefighting techniques such as the use of heavy machinery. Therefore, wherever practicable, firefighting strategies in these areas should be limited to low impact, habitat friendly methods.



**Construction of continuous emergency/maintenance road** – Vehicular access to portions of BPNR which experience high maintenance and patrol needs and emergency access remains challenging. This is particularly problematic in the area of the pond. A ¼ mile of new jeep road connecting the upper Bunnell Road to the road from Brittany Court (Highland Drive), which reaches Highway 1, was constructed in 2005. This created a continuous emergency/maintenance road access across the property, but Brittany Court access has since been lost. Due to continued fire history in the open space and the level of heavy use the area receives, City staff believe that continued investigation of emergency access alternatives is essential to ensure the continued safety of people using the Reserve. A separate Emergency Access Alternatives Study was prepared in counterpart to the 2015 Update for City Council review.

**4.6 Fiscal Statement**

The fiscal impact of the adoption of the Bishop Peak Natural Reserve Conservation Plan 2015 Update is expected to be substantive. It will consist of maintaining the patrol and maintenance of the property at an increased level, and the implementation of several small-scale capital improvements. The latter include:

- ;
- Revegetation and restoration of several portions of the Bishop Peak "Summit" Trail; and
- Revegetation of areas in the vicinity of the pond, the unnamed tributary to Stenner Creek, and other locations within the site.
- Excavation of accumulated silt in the stock pond for enhanced habitat value, stock watering, and use in the event of a wildland fire event for aerial suppression tactics.

None of these projects are considered costly, and would be paid out of maintenance funds available with the Open Space Maintenance CIP in the 2015-17 Financial Plan. Revegetation projects may be funded internally with Natural Resources Program and Ranger Service operating budgets or may utilize grant fund sources. Overall cost of the revegetation / restoration programs is considered to be in the \$25,000 range. The stock pond excavation project is likely also in the \$25,000 range.

The Wildfire Preparedness Plan has certain minor maintenance costs associated with it, specifically, periodic pruning of vegetation in a limited area, and the periodic removal of downwood within 200 feet of the Reserve boundary where it is adjacent to residential property. For the most part, however, the Wildfire Preparedness Plan would utilize livestock grazing as the primary management tool, as most of the lands identified as fuel management areas are non-native grasslands most appropriately managed by proper range management techniques.

There is strong continued interest in increasing Ranger presence at BPNR. Currently the City Ranger force expends about 6 hours per week at BPNR on patrol and an average of an additional 4 hours per week in maintenance. Three new Ranger positions were created in 2015, together with a revised strategy for deployment of the existing Rangers, creating enhanced overall Ranger patrol at BPNR for the first time in many years.

#### *4.7 Photo-points and Monitoring*

A series of 10 photo-points have been established at sensitive areas within the BPNR (Figure 7). The purpose of establishing such points is to build a pictorial record of how the status of the resource is changing over time. This will allow managers to make informed decisions about actions that should be taken to address issues relating to overuse of the reserve and associated impacts to the resource. Individual photo-points are identified using a system of coordinates, bearings, and the date to identify the location, direction and time of each photograph. It is recommended that annual photographs are taken on approximately the same date to give an accurate record of the status of the resource during comparable times of the year.

**Photo-point 1:** An area of high traffic in the region of the stock pond where the trails from the Patricia Drive and Highland Drive access points meet. The concentration of foot traffic in this area has resulted in trail braiding, erosion problems, and has prevented the establishment of native shrubs and trees. Recent restoration efforts have fenced large portions of the open grassland areas adjacent to the stock pond, and planted native vegetation. The success of these efforts will be monitored from this photo point.

**Photo-point 2:** The main access trail for both the Felsman loop trail and the Peak trail, and it experiences very heavy traffic. This photo point will monitor the status of this heavily used portion of the trail system and increases in trail width and/or braiding of the trail in this area will be evident.

**Photo-point 3:** An area of the Felsman loop trail that is currently experiencing a small degree of gully formation and width expansion on the main trail. This photo point will monitor any deterioration in this portion of the trail system over time.

**Photo-point 4:** A Series of switchbacks ascending towards the peak, this area of the trail system is particularly susceptible to erosion due to the high levels of use it experiences from users who summit the mountain, and also because of the steep terrain in this area.

**Photo-point 5:** A shortcut trail which has developed close to the pond area in the foot hills of the peak. This area should be monitored carefully and restorative activities implemented to either make the shortcut the official trail or concentrate use on to the existing official trail.

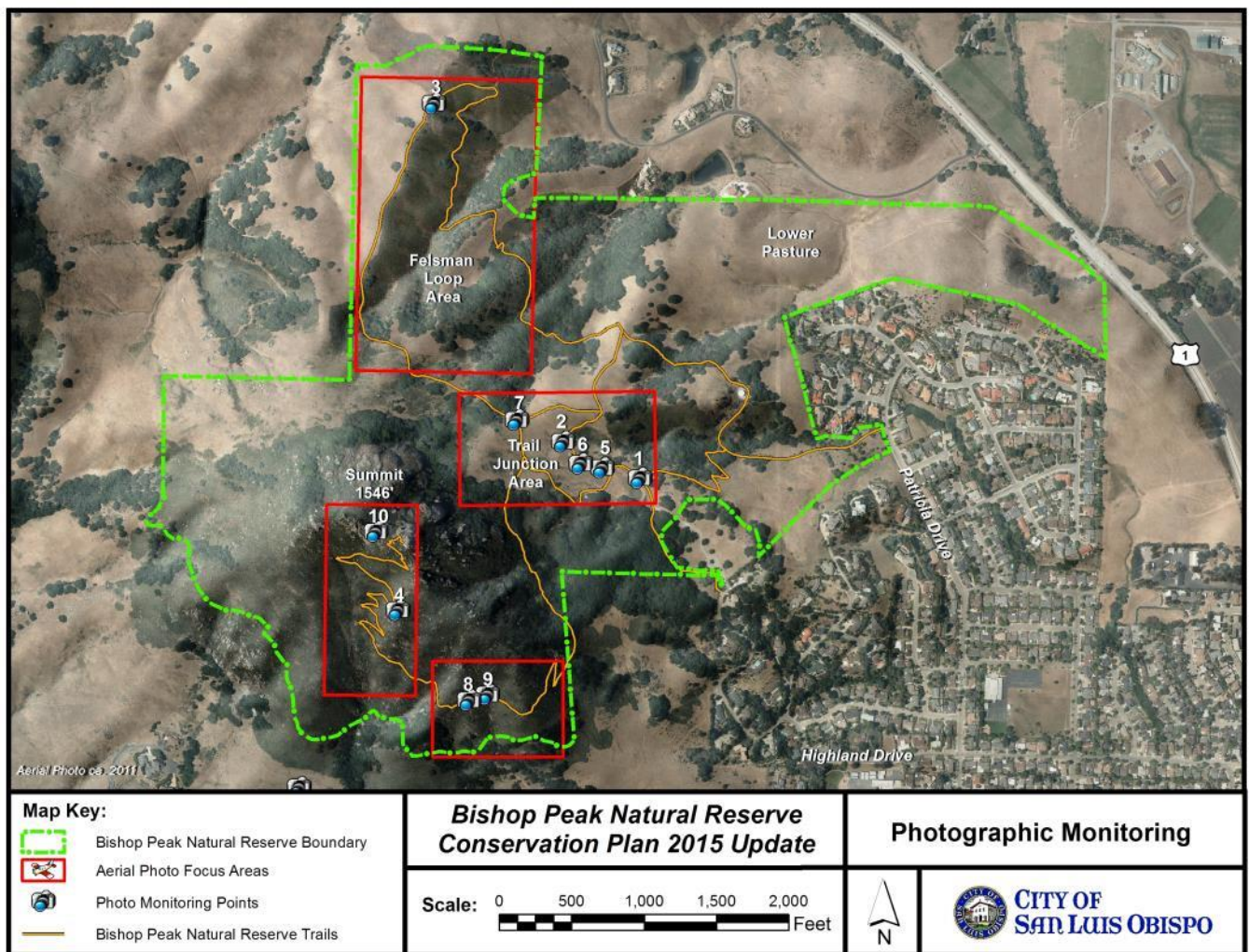
**Photo-point 6:** A poplar bouldering rock in the BPNR foothills. Heavy use of this area has resulted in the elimination of all native vegetation around the rock and erosion of top soil has resulted.

**Photo-point 7:** Trailhead for the Bishop Peak trail, this is a very heavily used section of the Bishop Peak trail, and should be monitored for increases in trail width and braiding of the trail.

**Photo-point 8:** Junction of the bootleg trail originating from the unofficial access point on Foothill Drive, and the official Bishop Peak trail. This junction of two heavily used trails is an area of heavy foot traffic and should be monitored for increases in trail width, braiding and erosion problems.

**Photo-point 9:** The bootleg trail originating from the unofficial access point on Foothill Drive, this trail is very steep and has no switchbacks. This trail is very prone to erosion problems and should be closely monitored for signs of gully formation and expansion in width.

**Photo-point 10:** The ridge trail is very heavily used by hikers who summit the peak. As of 2003, the trail was in good repair, having narrow width and good growth of trailside vegetation. Due to the heavy use in this area, the ridge trail should be closely monitored for signs of deterioration. As of 2015, this will remain as a photo-point; however the photo itself will be replaced with one that is a view depicting a broader scene that will be much more useful over time.



In addition to ground-level photo-points, comparative aerial photography has also been established with the 2015 Update. These photo-points and aerial photo focus areas follow on the ensuing pages.

**Table 5: 2004-2015 Photo Monitoring Points:**

(All photos established Spring, 2015 by Douglas Bush, using images from a Sony A7r)

	2004	2015
1		
2		
3.		
4		
7		



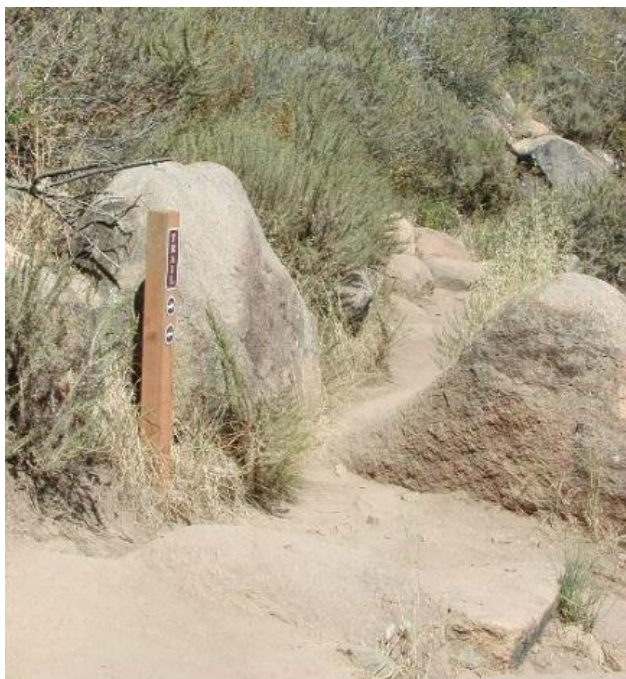
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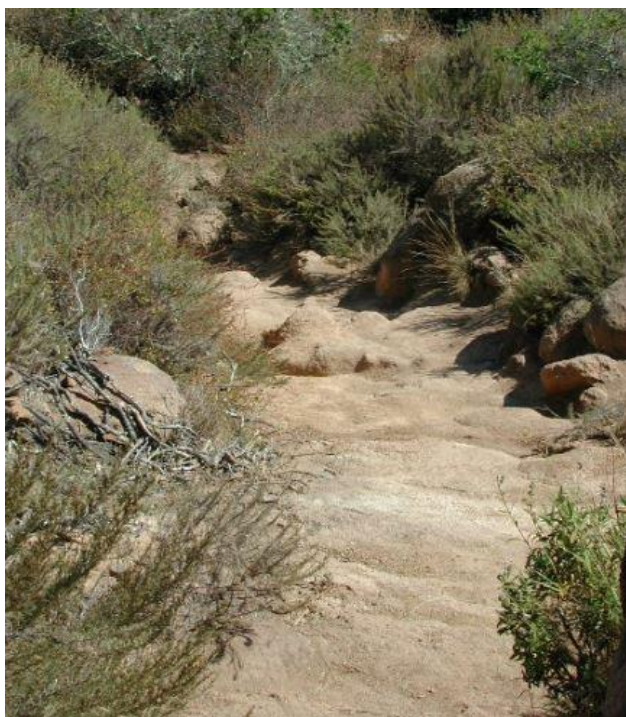
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5



6



10



To be replaced

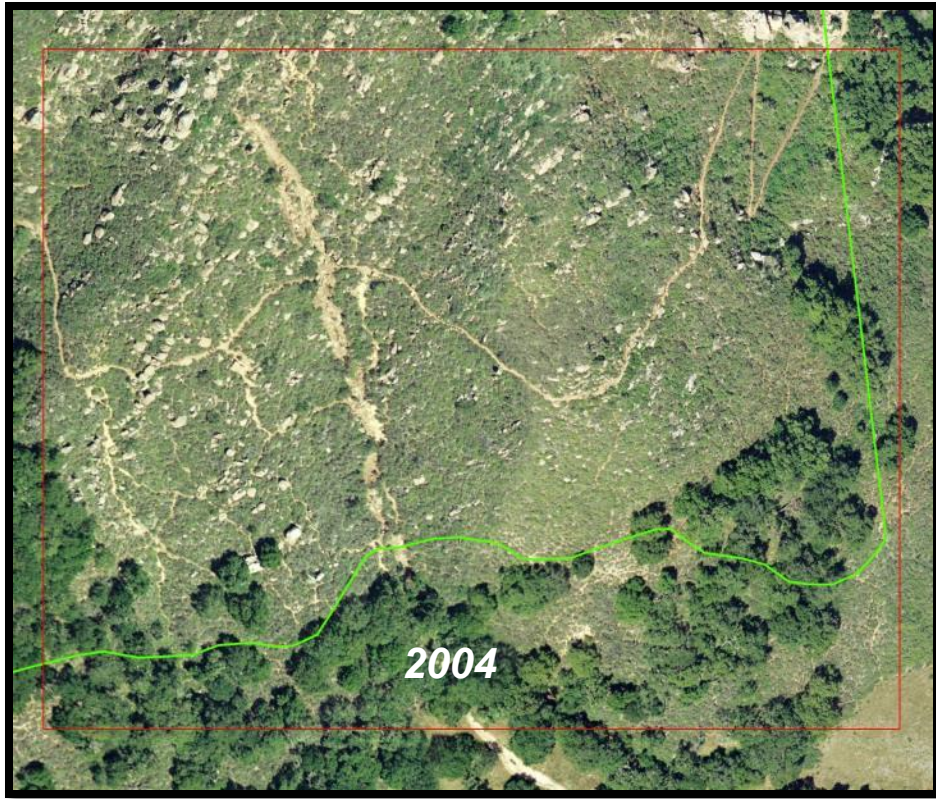


**Aerial Photo Comparison - Felsman Loop Area**

**Aerial Photo Comparison – Trail Junction Area**

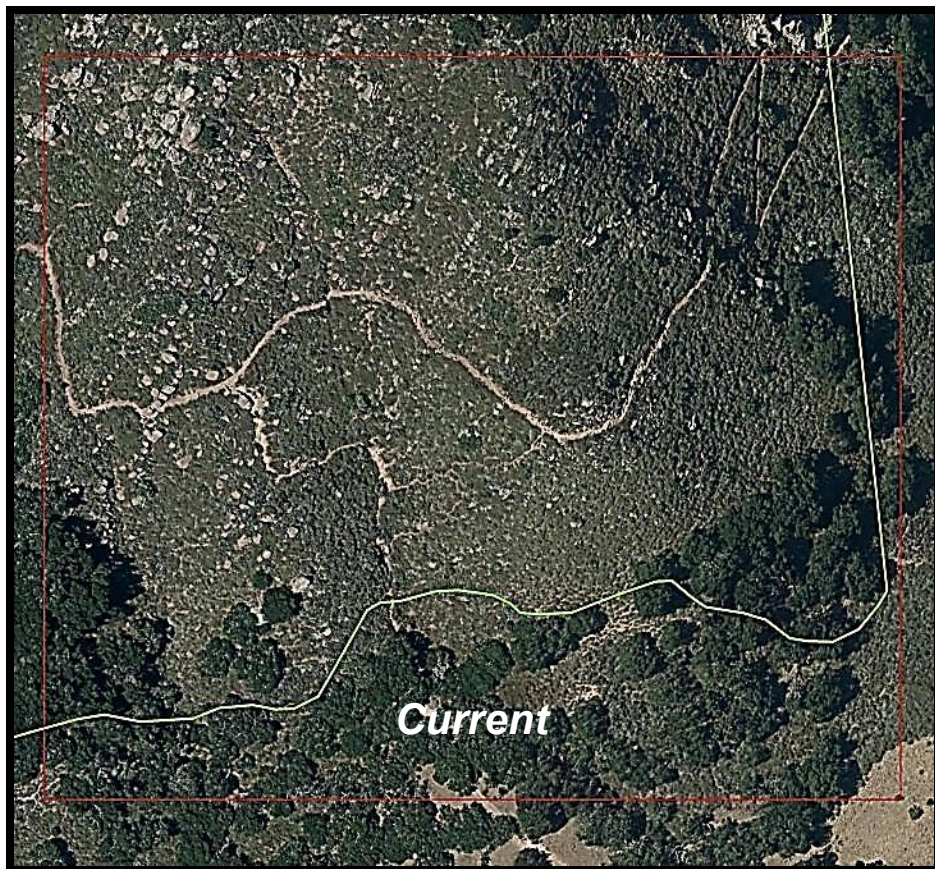


Aerial



Photo

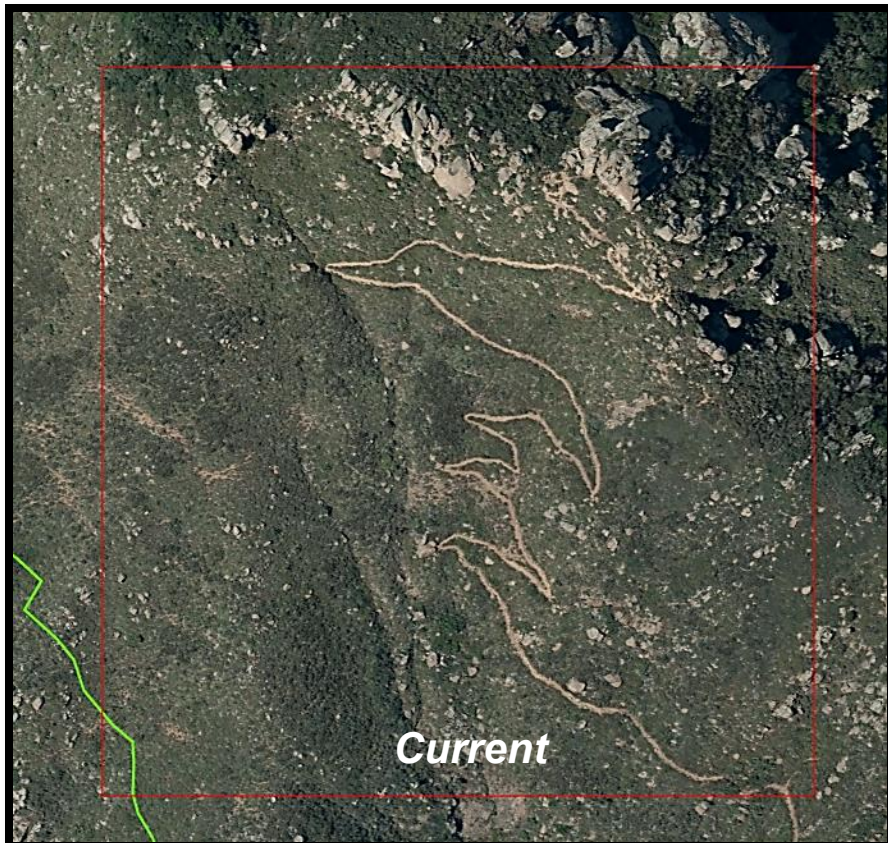
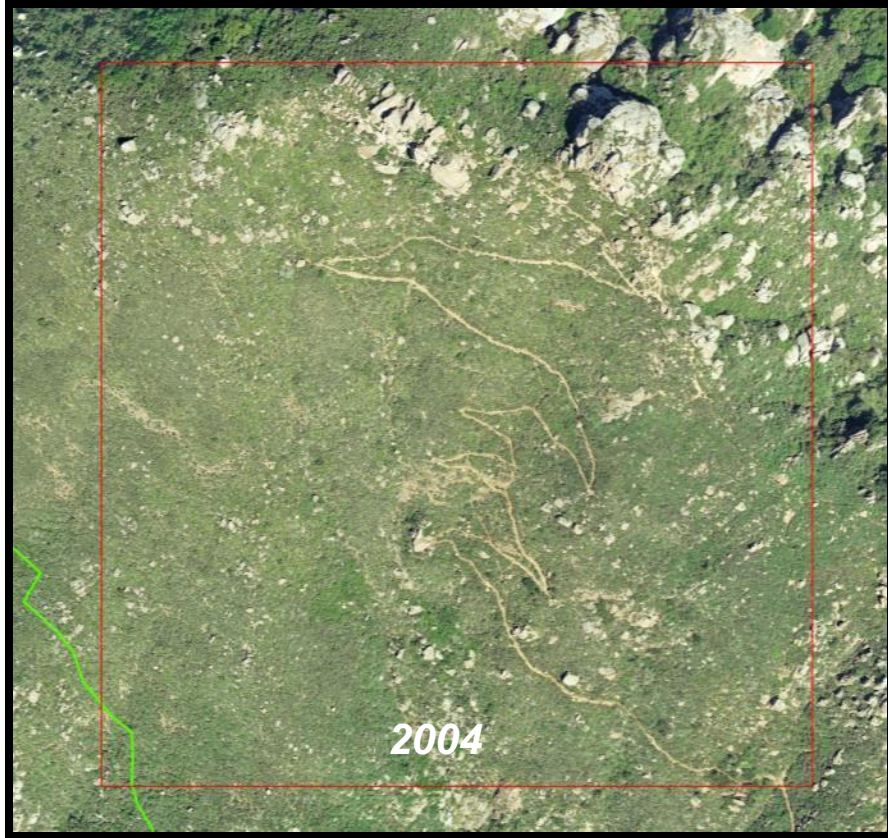
Comparison  
Summit Trail  
Foothill  
Access Area



-  
/

**Aerial Photo  
Comparison -  
Summit Trail**

**Upper  
Area**

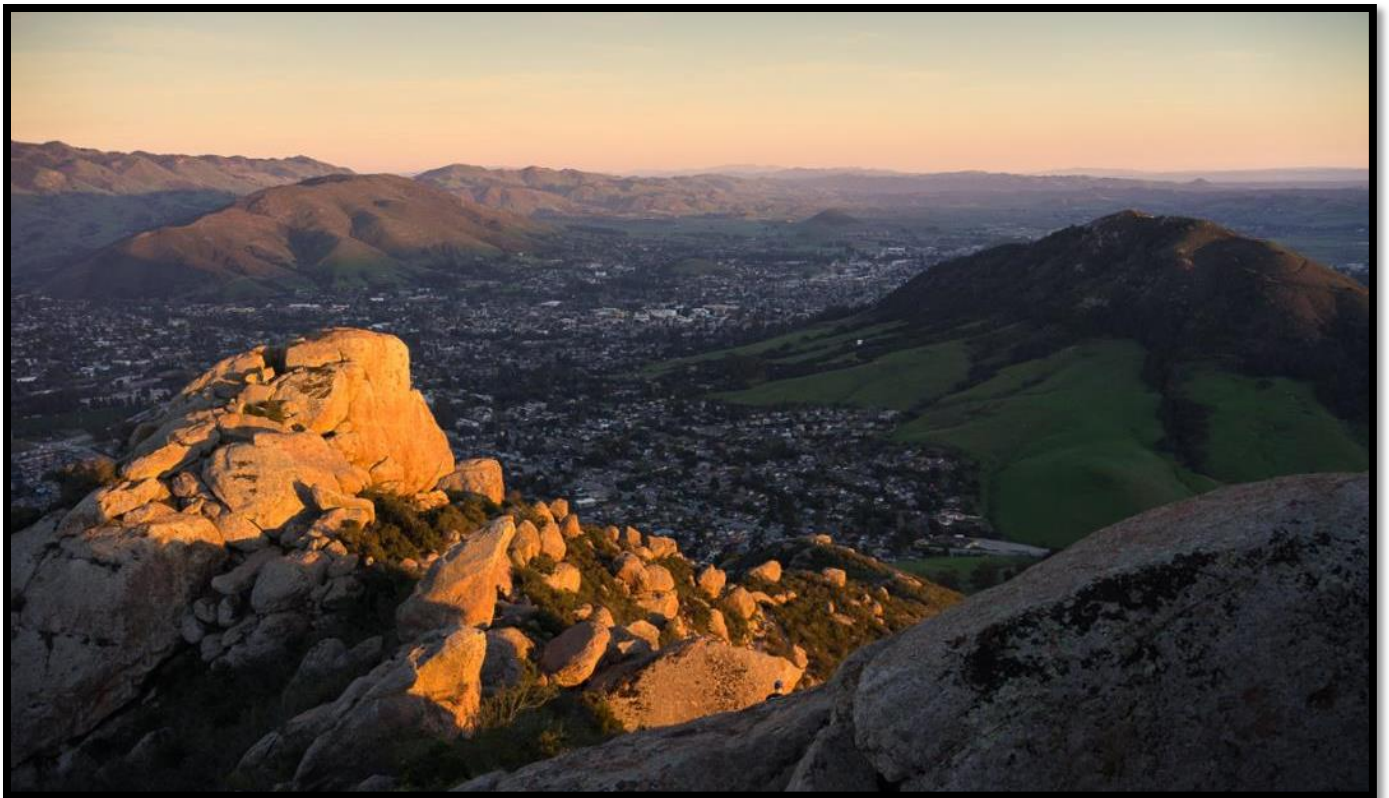


## 5. Updates and Amendment

This Conservation Plan Update is intended to guide management actions over the course of the next ten years, after which time staff should consider the need for a second update. Any portion of the plan may be considered for amendment upon request. Any citizen or other interested party may initiate such a request, and shall be directed to the City Manager or designee. Such a request will include the nature of the requested amendment and rationale for the request. If appropriate, the amendment will be processed in the same manner as the original Conservation Plan.

## 6. References

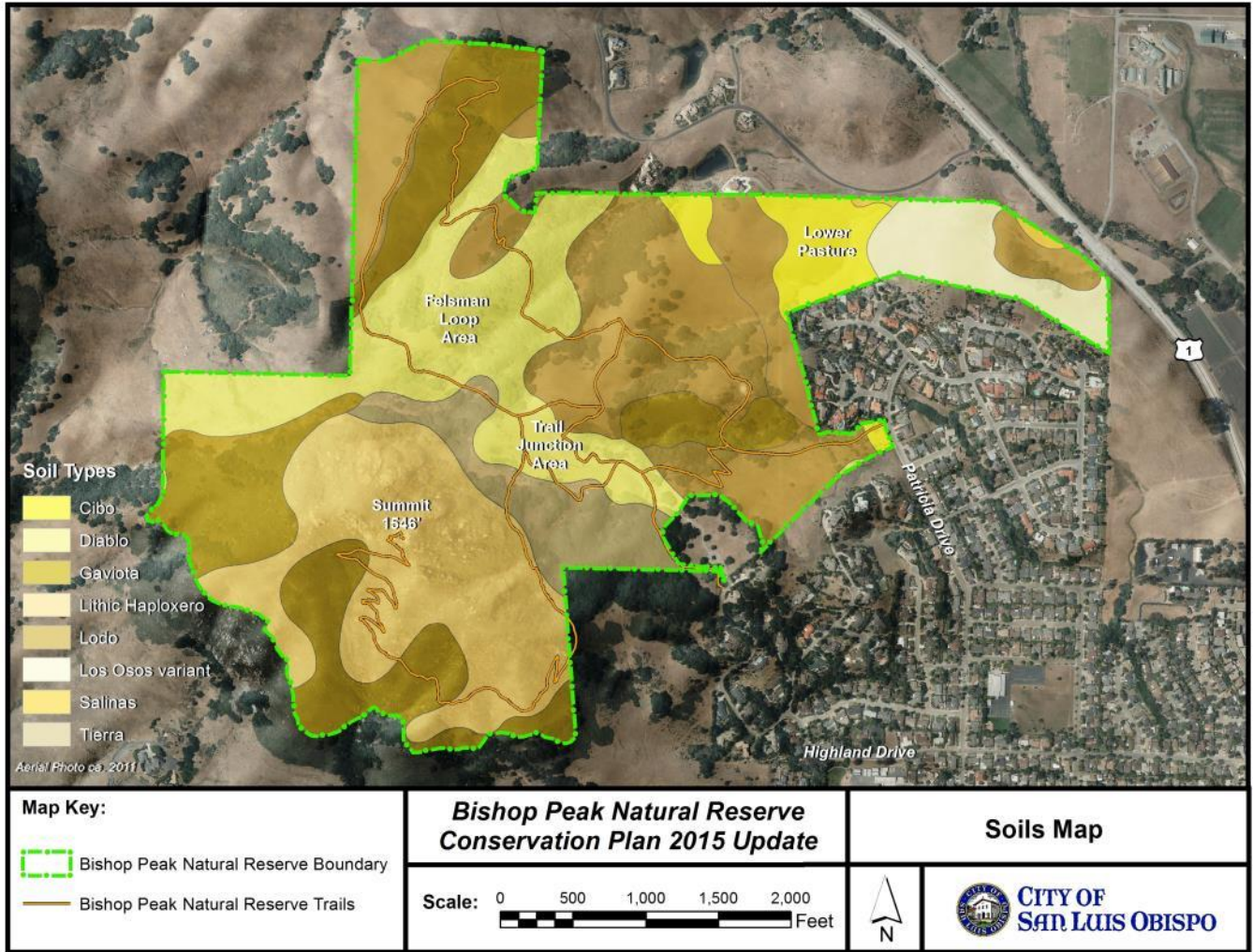
The following sources are available by request:	
1.	City of San Luis Obispo Municipal Code, Open Space Regulations, Chapter 12.22. Ordinance 1332 § 1 (part), 1998.
2.	<i>Conservation and Open Space Element, General Plan</i> . City of San Luis Obispo, 2006.
3.	<i>Conservation Guidelines for Open Space Lands of the City of San Luis Obispo</i> . City of San Luis Obispo, 2002.
4.	<i>Mountains of Fire: San Luis Obispo's Famous Nine Sisters – A Chain of Ancient Volcanic Peaks</i> . Dickerson, S., 1990.
5.	<i>Summary and Results of a Plant Inventory and Wildlife Survey at Bishop Peak Natural Reserve, City of San Luis Obispo, California</i> . Terra Verde Environmental Consulting, 2015.
6.	<i>Wildlife Survey and Identification of Game Trails, Bishop Peak Natural Reserve, Fall 2013</i> . Engdahl, J., 2014. Biological Sciences Department, California Polytechnic State University, San Luis Obispo.
7.	<i>City of San Luis Obispo Open Space Survey</i> . Riggs, Rugh, Jackson, Steffan, Knox, 2015. City and Regional Planning Department, California Polytechnic State University, San Luis Obispo.





## Appendix A

### Soils Map and Description



**Los Osos** loams have developed on 13.5 acres of the IHNR in the eastern corner of the property. They occur above the sandstone and shale in the mélangé (Franciscan Formation). Los Osos clay loams appear dark grayish brown and fine textured at the surface. Underneath they are primarily brown to yellowish brown heavy clay loam. They have relatively slow permeability, are well drained, and have medium runoff. The effective rooting depth is 20 to 40 inches. The pH is slightly to medium acid to neutral. Vegetation is mostly annual grasses and forbs with some perennial grasses, coastal sagebrush (*Artemisia californica*), and coast live oak (*Quercus agrifolia*).

**Diablo complex** soils are found in association with Los Osos soils on 32 acres on sloping land to the east of the IHNR. They are formed from weathered sandstone, shale, and conglomerate. The surface layers include brown gravelly loam underneath un-decomposed leaves. Beneath is a light yellowish brown gravelly loam over bedrock. Maymen sandy loams have relatively slow permeability, are well drained, and have medium runoff. The effective rooting depth is approximately 15 inches, with a few large woody roots that grow through the rocky substrate to

60 inches in depth. Maymen soils are medium to strongly acidic. Vegetation is usually open stands of chaparral consisting of chamise (*Adenostomafasciculatum*), scrub oak (*Quercusberberidifolia*), and, in protected sites, scattered coast live oak (*Quercusagrifolia*).

**Gaviota** soils are found on 20.5 acres in the northern/central region of the IHNR. They are a brown to dark grayish brown fine sandy loam, developed from light yellowish brown sandstone. They have moderately rapid permeability, are well drained, and have medium to rapid runoff. Their effective rooting depth is from six to 20 inches. They are medium acid to neutral. Uncultivated areas have a cover of annual grasses and forbs. Steeper areas usually have a cover of brush.

**Obispo-rock outcrop** is the most common substrate type within the IHNR, and is found on 600.5 acres. These often support soils which are very dark gray at the surface. Beneath the top layer is black, yellowish brown, or olive colored serpentinite. This soil type has very slow permeability. Obispo rock-outcrops are very well drained and have rapid to very rapid runoff. Their effective rooting depth is between eight and 20 inches. Their pH ranges from moderately alkaline to neutral. The sparse vegetative cover on Obispo-rock outcrops and associated soils consists of scattered shrubs such as leather oak (*Quercusdurata*), toyon (*Heteromelesarbutifolia*), and sagebrush (*Artemisia fasciculatum*), as well as grasses and forbs.

**Lodo** is a grayish brown to very dark grayish brown shaly clay loam over dark grayish brown hard shale. It has moderate permeability, is somewhat excessively drained, and has medium to rapid runoff. Lodo soils are found on 28.5 acres within the IHNR. The effective rooting depth is from four to 20 inches. It is slightly acid. Native vegetation is primarily chaparral, with some buckwheat (*Eriogonumfasciculatum*) and scattered oaks (*Quercus spp.*). Naturalized cover includes annual grasses and forbs.

**Salinas** soils are typically deep and well drained, formed in alluvium or weathered from sandstone and shale. Salinas soils are found on alluvial plains, fans, and terraces and have slopes of 0 to 9 percent. Within the IHNR Salinas soils are found on 7.3 acres adjacent to Prefumo Creek to the north of the property. They are found at elevations of 50 to 2,000 feet. The climate is dry subhumidmesothermal with cool to warm rainless summers with some fog and cool moist winters. Mean annual precipitation is 12 to 20 inches. They are well drained soils, with slow to medium runoff and moderately slow permeability.

**Briones** formation typically consists of distinctly bedded, gray to white, fine-grained sandstone and siltstone. Sandstone beds are as thin as 5 to 10 cm, with 2 to 10 cm thick shale interbeds. These are interbedded with massive fine-grained sandstone beds as much as five meters thick. The middle part of the Formation consists of indistinctly bedded, white, fine- to coarse-grained sandstone, conglomeratic sandstone, and massive shell-hash conglomerate (shell beds). Shell-hash conglomerate is made up of interlocking mollusk and barnacle shells and shell fragments in a white calcareous sandstone matrix.