E4. Environmental Impacts

Master Management Plan Update and Associated Park Improvement Projects
Draft Environmental Impact Report

EDAW

E4 ENVIRONMENTAL IMPACTS

E4.1 DETERMINING LEVELS OF SIGNIFICANCE

Determining the significance of project impacts is fundamental to achieving the objectives of the CEQA. Section 15091 of the State CEQA Guidelines provides that a public agency shall not approve a project for which an EIR has been certified which identifies one or more significant environmental effect of the project unless the public agency makes one or more of the following findings:

(1) Changes or alterations have been required to, or incorporated into, the project that avoid or substantially lessen the significant effects identified in the Final EIR;

(2) Such changes or alterations are within the responsibility of another public agency and have been, or can and should be, adopted by such other agency; or

(3) Specific economic, legal, social, technological, or other considerations make infeasible the mitigation measures or project alternatives identified in the Final EIR.

If an agency approves a project that would result in significant impacts, which are not avoided or substantially lessened, State CEQA Guidelines Section 15093 requires the agency to adopt a statement of overriding considerations, stating the specific reasons why the benefits of the project outweigh the adverse environmental consequences identified by the EIR.

The level of significance for each impact examined in this EIR was determined by considering the predicted magnitude of the impact against a threshold. Thresholds were developed using criteria from the State CEQA Guidelines; federal, state, and local regulatory schemes; local/regional plans and ordinances; accepted practice; and/or consultation with recognized experts. The relevant thresholds of significance are listed below in Section E4.3 at the beginning of each resource topic, followed by detailed impact discussions identifying whether implementation of the BPMMP or the four site-specific Park Improvement Projects would result in one or more of the thresholds being exceeded. Mitigation measures for potentially significant and significant impacts are provided immediately following each impact discussion. The specific projects to which the mitigation applies are listed at the end of each mitigation measure, along with information on timing and the responsible party for implementation.

Four levels of impact significance are recognized by this EIR:

Less than significant impacts would not cause a substantial adverse change in the environment and would not require mitigation.

Potentially significant impacts may cause a significant effect on the environment, but information is lacking regarding the extent or certainty of the impact. This designation may be applied to impacts for which information is incomplete or unavailable, to impacts that are qualitative in nature and cannot be readily quantified, or to impacts that would be significant, but there is uncertainty about whether they would occur. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures are identified to reduce potentially significant impacts to a level that is less than significant.

Significant impacts would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of the project effects using specified significance criteria. Mitigation measures are identified to reduce impacts to a level that is less than significant.

Significant and unavoidable impacts are significant adverse project impacts that cannot be avoided or mitigated to a less than significant level. This designation can be given to impacts for which there are no feasible mitigations or alternatives, or to impacts for which mitigation measures can be applied but are not sufficient to reduce impacts to a level that is less than significant.

E4.2 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

Based on the NOP dated October 14, 2004 (Appendix E1), comments received on the NOP (Appendix E1), and preliminary analysis, the project would clearly have no significant impacts on several environmental issue areas. These issue areas need not be evaluated in detail in this EIR, in accordance with §15128 of the State CEQA Guidelines. The specific issue areas include effects on agricultural resources, population and housing, and mineral resources. The reasoning for excluding each of these resources from further analysis is briefly discussed below.

E4.2.1 AGRICULTURAL RESOURCES

Bidwell Park is designated as "Parks" in the Land Use Element of the City of Chico's General Plan. The Park does not include areas designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on maps prepared for the State's Farmland Mapping and Monitoring Program, and it does not include lands under Williamson Act contracts. As a result, implementation of the BPMMP or any of the four Park Improvement Projects would have no impact on agricultural resources, and no further analysis is necessary.

E4.2.2 POPULATION AND HOUSING

The BPMMP contains no policies pertaining to residential uses or substantial changes in job forming uses, so its implementation would not alter housing supply or substantially change employment in the region. Bidwell Park serves park users primarily from the local Chico area, but it also represents a regional destination for certain user groups. Based on the characteristics of the Park, it is expected that the primary regional visitor base consists of the

four nearest counties (i.e., Butte, Glenn, Colusa, and Tehama Counties). The population of this four-county area is projected to grow by approximately 2–4% annually through 2020 (DOF 2001). There are no features of the BPMMP or any of the four Park Improvement Projects that would directly cause changes in local or regional population or housing supply or have any substantial indirect attraction to population or housing growth. Implementation of the BPMMP and the four Park Improvement Projects would enhance natural resources and recreational qualities of the Park, but would not substantially alter the types of existing uses or substantially increase the capacity of park facilities, which in turn could lead to more people being attracted to move to the area. As a result, no impacts on population and housing would occur, and no further analysis is necessary.

E4.2.3 MINERAL RESOURCES

The California Department of Conservation, Division of Mines and Geology (CDMG), classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act (SMARA) of 1975. Mineral Resource Zones (MRZs) have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows:

- **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- **MRZ-2:** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
- **MRZ-3:** Areas containing mineral deposits the significance of which cannot be evaluated from available data.
- **MRZ-4:** Areas where available information is inadequate for assignment to any other MRZ.

No commercial mining operations are known to have occurred in the Park. The Park is classified as MRZ-1 by the Division of Mines and Geology.

The Park is not considered to contain regionally or locally important mineral resources. As a result, implementation of the BPMMP or any of the four Park Improvement Projects would have no impact on mineral resources, and no further analysis is necessary.

E4.3 SIGNIFICANT AND POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

The following section discusses those environmental impacts that may have a significant or potentially significant effect on the environment as a result of implementation of the BPMMP or one or more of the four Park Improvement Projects. Resource issues are addressed in alphabetical order. Within each resource topic,

significance threshold criteria for each resource are provided first, followed by an analysis of potential impacts on the resource resulting from implementation of the BPMMP and the four specific Park Improvement Projects. Existing setting information and regulatory framework summaries have already been developed for most resource issues and are contained in the BPMMP. For each resource topic addressed in this section, a reference is made to the pages in the BPMMP where the relevant existing setting information is found. For those resource topics not described in detail in the BPMMP (such as air quality, hazards and hazardous materials, and noise), a brief discussion of existing conditions and summary of the regulatory framework are provided at the beginning of the resource topic discussion. Where useful for the reader, a brief summary of the existing conditions of a resource topic described in more detail in the BPMMP may also be provided at the beginning of each resource topic section. A description of methods for determining impacts is also included at the beginning of each impact discussion. Mitigation measures to reduce potentially significant and significant impacts to less than significant levels are provided immediately following the impact determinations. At the end of each impact discussion, a finding of the level of significance after mitigation is made.

E4.3.1 AESTHETICS

E4.3.1.1 ENVIRONMENTAL SETTING

The following discussion of existing conditions constitutes a summary of the aesthetic setting relevant to the impacts and mitigation measures that follow. More specific information about existing aesthetic resources in Bidwell Park can be found in Section 2.3.5 of the BPMMP. Important resources include the Park's viewsheds and the night sky above the Park given the location of the Kiwanis Club Observatory in Middle Park adjacent to Horseshoe Lake. Goals, objectives, implementation strategies, and guidelines pertaining to aesthetic resources are located in Section 3.5.3.5 of the BPMMP. These BPMMP elements aim to protect and preserve the scenic qualities of the Park and the clarity of the night sky. Appendix L of the BPMMP contains the Design Standards for the Park, which were updated concurrently with the BPMMP to provide for a unified and natural look of facilities that blend in well with the natural surroundings of the Park. Section 3.5.2.2 of the BPMMP identifies goals and objectives and implementation strategies and guidelines related to surrounding land uses.

Scenic Vistas

A scenic vista is a view of an area, often over a long distance, that has remarkable scenery or a high quality scenic resource indigenous to the area. The Park contains numerous scenic resources, including trees, rock outcroppings, Horseshoe Lake, rolling grasslands interspersed with vernal pools, Big Chico Creek, a spectacular canyon carved out of the Tuscan Formation, and many scenic viewpoint overlooks that would be considered scenic vistas.

The visual character of Middle and Upper Park is dominated by rolling hills, sloped terrain, and natural vegetation of the foothill region that includes grasslands, vernal pools, chaparral, and woodlands. Scenic viewpoints in Upper Park include the South Rim Trail and Humboldt Trail, along the south ridgeline, and Ten Mile House Road and other trails, which provide panoramic views of the Park and the nearby areas. The North Rim Trail provides northern views of the Big Chico Creek canyon area. The Yahi and Lower Trails provide northern views of sloping terrain and views of Big Chico Creek to the south.

Lower Park is characterized by flatter terrain and both natural vegetation and existing recreational features. Lower Park includes large areas covered with riparian vegetation characterized by mature trees and a thick understory. Viewpoints of Big Chico Creek, along with most of the Park's recreational structures, exist along North Park and South Park Drives. Lower Park contains numerous pedestrian, bicycle, and equestrian trails and provides local views of Park structures and vegetation.

The Park is also visible from nearby roadways including Vallombrosa Avenue, East Eighth Street, Centennial Avenue, Woodland Avenue, SR 99, Manzanita Avenue, Mangrove Avenue, and Camellia Way.

Sources of Light and Glare

Light associated with urban development can result in spillover lighting and glare effects. Spillover lighting is artificial lighting that spills over onto adjacent properties and could cause an annoyance to neighboring residents. Glare is intense light that shines directly, or is reflected off of a surface, into a person's eyes. Use of reflective building materials, such as glass and polished surfaces, can cause glare. During daylight hours, the amount of glare depends on the intensity and direction of sunlight. Glare is particularly acute at sunrise and sunset because of the low angle of the sun in the sky. At night, artificial light can cause glare or skyglow. Skyglow is artificial lighting from urbanized uses that alters the rural landscape and, in sufficient quantity, lights up the nighttime sky, thus reducing the visibility of astronomical features.

Except for Lower Park, where most of the recreation facilities are located, the Park currently contains very few developed structures, which generate a very limited amount of light and glare effects or nighttime lighting effects; these would include picnic areas, restroom facilities, a limited amount of lighted path, the Hooker Oak Recreation Area, the Equestrian Center, the Kiwanis Community Observatory, the municipal golf course, and a few community buildings, such as the Chico Creek Nature Center. The skies above Bidwell Park are known for the clarity of astronomical features at night. Weekly stargazing events are held at the Kiwanis Community Observatory, located in Middle Park near Horseshoe Lake.

Scenic Roads/Resources within State Scenic Highways

A "scenic resource within a state scenic highway" is a resource that is noted for its outstanding scenic qualities and is visible from a state-designated scenic highway. There are no segments of state- or county-designated scenic highways adjacent to Bidwell Park. The closest scenic roadway is SR 70, approximately 12 miles south of the project site, and while this highway is eligible for state listing, it has not been officially designated to date (California Department of Transportation 2003).

The City of Chico's General Plan identifies local scenic roads. Per General Plan Policy CD-G-10 Vallombrosa, Manzanita & Woodland Avenues are designated as local scenic roads.

E4.3.1.2 SIGNIFICANCE CRITERIA

An impact on visual and aesthetics resources resulting from implementation of a proposed project would be considered significant if it would:

- Have a substantial adverse effect on a scenic vista, including scenic roadways or a Federal Wild and Scenic River;

- Substantially damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway;
- Affect lands preserved under a scenic easement or contract;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

E4.3.1.3 METHODOLOGY

Potential impacts related to visual and aesthetic resources resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines in the BPMMP and determining whether implementation of the BPMMP would result in potentially significant or significant effects.

For the four Park Improvement Projects, actions that would be implemented under each of the conceptual project plans were considered in relationship to the known visual resources in the project areas, and then were considered in relationship to project goals, objectives, and implementing strategies and guidelines.

E4.3.1.4 IMPACT DISCUSSION

IMPACT AES-1: ALTERATION OF A SCENIC VISTA

Impact AES-1a: Alteration of Scenic Vistas with Implementation of the BPMMP

The BPMMP includes goals, objectives, and implementation strategies and guidelines designed to identify and protect the scenic and aesthetic resources within the Park. Goal AR clearly states the BPMMP's purpose to identify and protect the scenic resources in Bidwell Park; Visual Resources Objective O. VR-1 seeks to protect scenic characteristics and aesthetic resources; Visual Resource Objective O. VR-2 seeks to keep structures and other developed features to a minimum and have them blend in with the natural environment; Visual Resources Objective O. VR-3 encourages the use of native plants for landscaping, and Visual Resources Objective O. VR-4 calls for the limitation of irrigated turf to the more intensely developed area of the Park. In addition, Viewshed Objective O. VS-1 seeks to protect the viewshed from Park vantage points, and Night Sky Objective O. NS-1 seeks to protect the night sky. Visual Resources Implementation Strategies and Guidelines I. VR-1 through I. VR-5, Viewshed Implementation Strategies and Guidelines I. VS-1 and I. VS-2, and Night Sky Implementation Strategy I. NS-1 all seek to achieve these stated goals and objectives and to protect the visual resources and scenic characteristics of, and night sky above, Bidwell Park.

Goal SLU-1 calls for the establishment of a Bidwell Park Sphere of Influence (BPSI) in order to preserve and enhance the experiential value of Bidwell Park and protect the Park from adverse effects within the BPSI. Objective O. SLU-1 specifies rules for implementation of the BPSI policy and implementation strategy I. SLU-1 states how the BPPC would implement the policy by providing input during review of discretionary development projects within the BPSI. The City Council has adopted the BPSI policy and all City projects that fall within the BPSI sphere will now be forwarded to the Bidwell Park and Playground Commission for its input.

The BPMMP contains additional objectives and implementation strategies and guidelines aimed at surrounding land uses that are also intended to preserve and enhance the Park's scenic characteristics. Specifically, Surrounding Land Use Objective O. SLU-6 calls for the prevention of the park viewshed from being obstructed by surrounding development. Surrounding Land Use Implementation Strategies I. SLU-6 through I. SLU-9 target the protection of the Park's viewshed through communication with adjacent landowners, provision of setbacks, development of architectural guidelines, and landscape plans. Implementation of these strategies would minimize potential adverse effects to the Park and on habitat conditions. The BPMMP also contains objectives and implementation strategies and guidelines for facilities development and maintenance that specifically aim at protecting scenic and aesthetic resources. Facilities implementation strategy I. F-2 calls for the use of materials that have the least adverse effect and greatest benefit to the environment, including aesthetics. This would be achieved through facilities siting and use of native vegetation and materials that blend in with the natural environment.

Implementation of the BPMMP would ensure the preservation of the Park's scenic vistas and City designated scenic roads and would result in an overall beneficial impact on scenic vistas. No mitigation is required.

Applies to: BPMMP

Impact AES-1b: Alteration of Scenic Vistas with Implementation of Park Improvement Projects

Each of the Park Improvement Projects has been designed to preserve, protect, and enhance scenic views as part of the overall recreation experience for Park visitors. These Plans were developed while taking the scenic quality and natural diversity of these sites into account. Any proposed new elements have been carefully sited and designed to preserve the integrity of the sites and avoid adverse effects on visual resources. Furthermore, no new significant structures or alterations to the natural landscape are being proposed.

Implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan is expected to enhance the scenic quality of the project sites. These Plans call for a reduction in the number of informal trails (social trails), restoration/rehabilitation of degraded areas, and reduction of unmitigated use of the sites. Visual enhancement is also planned through the use of natural materials to demarcate trails, provide

interpretation, and provide facilities, such as picnic areas and scenic overlooks. The Cedar Grove Area Concept Plan includes the establishment of a new trail around the festival meadow and connector trails to facilitate pedestrian circulation during special events. These proposed improvements would also prevent the visual character of the area from being degraded, because they would discourage and counteract off-trail travel. The enhancement and clear demarcation of parking areas would lead to less off-road parking, which tends to damage the scenic quality of a site by damaging natural resources. In addition, all of the concept plans call for the use of native plants in site rehabilitation and the planting of native trees to enhance the natural character of the project site. The Horseshoe Lake Area Specific Plan also calls for the establishment of a natural vegetation edge along Horseshoe Lake.

Implementation of the Park Improvement Projects would result in a beneficial impact on scenic vistas in the Park. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and the Disc Golf/Trailhead Area Concept Plan

IMPACT AES-2: DAMAGE TO SCENIC RESOURCES WITHIN A STATE SCENIC HIGHWAY

The project site is not visible from any state- or County-designated scenic highways or roadways. General Plan Policy CD-G-10 identifies Vallombrosa, Manzanita & Woodland Avenues as local scenic roads. Implementation of the BPMMP and the four Park Improvement projects does not call for construction or placement of structures near any of these roadways, and no impacts would occur.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact on scenic resources within a state scenic highway or local scenic roads. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AES-3: EFFECTS ON LANDS PRESERVED UNDER A SCENIC EASEMENT OR CONTRACT

The Park is owned by the City of Chico and does not include any lands that are required to be preserved under a scenic easement or contract.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact on lands preserved under a scenic easement or contract. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AES-4: DEGRADATION OF VISUAL CHARACTER

Impact AES-4a: Degradation of the Park's Visual Character with Implementation of the BPMMP

Bidwell Park is one of the largest municipal parks in the United States, encompassing 3,670 acres of public parkland. The Park includes substantial scenic resources and provides access to scenic views both within and outside of the Park. The BPMMP includes goals, objectives, and implementation strategies and guidelines to preserve and protect existing scenic resources, and in some cases, provide new access to scenic viewpoints:

- Visual Resources Objectives O. VR-1, O. VR-2, and O. VR-3 and Visual Resources Implementation Strategies and Guidelines I. VR-1 through VR-5 aim to protect the Park's visual resources and scenic characteristics by seeking to keep structures to a minimum and using natural looking materials and native vegetation to help developed features blend into the natural environment of the Park;

- Viewshed Objective O. VS-1 and Viewshed Implementation Strategies and Guidelines I. VS-1 and I. VS-2 seek to protect the Park's viewshed by implementing the BPPC's "Sphere of Influence" policy and encouraging cooperation with other planning entities affecting the immediate surroundings of the Park;

- Utilities Objectives O. OU-2 and O. OU-3 and Utilities Implementation Strategies I. OU-1 and I. OU-2 address placement of new utilities and use of natural-looking containers for trash and recycling to preserve and enhance the visual character of the Park.

The newly updated Design Standards (Appendix L), and Design Standard Objective O. DS-2, and Design Standard Implementation Strategies I. DS-1 through I. DS-5 address the consistency of new and updated facilities, signage, and other Park elements with the natural character of the Park.

Recreational Activity Implementation Strategies and Guidelines I. RA-5 and I. RA-6 call for monitoring and adaptive management of recreational activities within the Park to avoid the degradation of physical, biological, cultural, aesthetic, and other resources.

Implementation of the BPMMP would not substantially degrade the existing visual character or quality of the Park, and would have a beneficial impact by protecting existing visual resources. No mitigation is required.

Applies to: BPMMP

Impact AES-4b: Degradation of the Park's Visual Character with Implementation of Park Improvement Projects

Each of the four Park Improvement Projects has been designed to preserve the existing visual character of the Park, while providing management of and necessary improvements to recreational facilities. Implementation of

the four site-specific Park Improvement Projects would not substantially degrade the existing visual character or quality of the respective project sites, and would have a beneficial impact by protecting existing visual resources.

The Trails Plan was developed to provide for optimal circulation in the Park while eliminating and rehabilitating redundant and informal trails, which would lead to an improvement of the Park's visual character. The Trails Plan also identifies problem areas that are suffering from severe erosion or excessive use and calls for the remediation of these sites by:

- Maintaining existing trails;
- Discouraging off-trail use;
- Maintaining, upgrading, or re-routing trails in known problem areas;
- Addressing unofficial/informal trails for either closure and restoration or establishment as an official trail; and
- Constructing proposed trails to standards outlined in the City' Trails Manual.

With implementation of the Trails Plan, all trails within the Park would eventually be brought up to the standards identified in the City's Trails Manual, which would lead to a reduction of erosion and, therefore, enhance the Park's visual characteristics.

The Horseshoe Lake Area Concept Plan and Cedar Grove Area Concept Plan also provide for better circulation and a reduction in the number of informal trails in the area. They also include planting/revegetation plans to enhance the aesthetics of the sites. These concept plans provide additional, well-delineated parking and call for the clear demarcation of parking spots and hardening of parking surfaces. This would reduce the number of vehicles that park off-road and would, therefore, preserve the natural resources and, in turn, the visual character of the sites. Hardening of parking lot surfaces would also reduce the amount of dust generated by vehicles and would, therefore, enhance the visual character of the Park during times of high visitor use.

Environmental criteria that were included in the design process of the proposed Disc Golf/Trailhead Area Concept Plan included areas that were identified for avoidance and protection. These areas, which included occurrences of Butte County checkerbloom, vernal pools, and ephemeral drainages, also constitute visual resources, which would be largely avoided under the conceptual project plan. The design criteria also identified resources for impact minimization, including blue oaks and other native oak species, Bidwell's knotweed populations, native wildflower fields, and the old Humboldt wagon road. All of these resources contribute to the attractive visual character of the project site, and under the conceptual project plan, impacts on these resources would be minimized to the greatest extent possible as a result of the proposed course design. The design places structures

and trails away from sensitive resources and minimizes the site footprint by providing clearly marked trails. It also provides facilities at a centralized location and demarcates parking, seeking to concentrate certain uses near the parking lot area.

The Disc Golf/Trailhead area is currently being utilized for disc golf with minimal infrastructure. This use has resulted in a degradation of the visual character of the site. Implementation of the Disc Golf/Trailhead Area Concept plan would enhance this situation by minimizing the disc golf area footprint and providing additional infrastructure designed to avoid sensitive resources. Existing facilities would be upgraded and new facilities constructed in accordance with the Park's updated Design Standards, thus preserving and enhancing the visual character of the Park.

All four of the conceptual project plans also call for the planting of native vegetation, either to screen existing and proposed facilities, to provide shade for parking and picnic areas, or to rehabilitate degraded areas. Additional native vegetation would also be planted around parking areas to soften the appearance of delineated parking lots, along the edges of Horseshoe Lake, and in other areas.

Potential for the degradation of the existing visual character or scenic quality of the Park resulting from implementation of the four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AES-5: NEW LIGHT AND GLARE EFFECTS

Activities within the Park are primarily recreational. These activities are supported by facilities and buildings that are generally not substantial sources of light or glare or that do not obscure views of the night sky, the BPMMP includes specific Night Sky Objective O. NS-1 and Night Sky Implementation Strategy I. NS-1 promoting the preservation of the night sky. In addition, Lighting Objective O. L-1, and Lighting Implementation Strategies I. L-1 and I. L-2 aim at preventing adverse effects of artificial light on wildlife and public vistas.

Of the four Park Improvement Projects, only the Cedar Grove Area Concept Plan calls for improvements to lighting to provide better circulation and safety in the area during special events. This lighting would replace temporary lighting currently installed by Park staff for special events, so the additional magnitude of light sources would not be substantial. Such lighting would also be subject to the City's adopted lighting standards that prohibit spill-over lighting and the shielding of light sources. The Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan do not include new sources of nighttime lighting.

Because the BPMMP and the four Park Improvement Projects do not propose substantial new sources of light or glare that would adversely affect day or nighttime views; impacts would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM AES-1

Implementation of the BPMMP and associated Park Improvement Projects would not result in significant adverse effects on aesthetic resources. With regards to several aesthetic resources such as scenic vistas and viewsheds, the proposed projects would result in a beneficial impact to the environments. Thus, the proposed projects will result in an overall beneficial cumulative impact to the aesthetic resources in the project area.

E4.3.2 AIR QUALITY

E4.3.2.1 ENVIRONMENTAL SETTING

The following discussion of existing conditions constitutes a summary of conditions specifically relevant to the impacts and mitigation measures that follow. Some specific existing-conditions information about air quality in Bidwell Park can be found in Section 2.3.1.4 of the BPMMP. Goals, Objectives, Implementation Strategies, and Guidelines pertaining to air quality are located in a subsection of Section 3.5.3.1 of the BPMMP. These BPMMP elements aim to protect and preserve and enhance the air quality in the Park.

Location

The proposed project site is located in the City of Chico within the Northern Sacramento Valley Air Basin (NSVAB), which is under the jurisdiction of the Butte County Air Quality Management District (BCAQMD). The NSVAB includes the counties of Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba.

Topography, Meteorology, and Dispersion

Dispersion of air pollution in an area is determined by such natural factors as topography, meteorology, and climate, coupled with atmospheric stability conditions and the presence of inversions. The factors affecting the dispersion of air pollution with respect to NSVAB and the proposed project site are discussed below.

Topography

The dimensions of the NSVAB are approximately 216 miles from the north to south and 95 miles east to west at the widest part. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. The surrounding mountain ranges reach heights of 3,500 feet in the southwest, 8,500 feet in the northwest, 1,700 in the southeast, and 10,500 in the northeast.

Meteorology and Climate

The annual temperature, humidity, precipitation, and wind patterns reflect the topography of the NSVAB and the strength and location of a semipermanent, subtropical high-pressure cell. Summer temperatures that often exceed 100 degrees Fahrenheit (°F) coupled with clear sky conditions are favorable for ozone formation. The majority of the precipitation in the valley occurs during the winter due to the presence of storms. The mountain ranges induce winter storms from the Pacific to release precipitation on the western slopes producing a partial rain shadow over the valley. The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. However, between winter storms high pressure and light

winds lead to the creation of low level temperature inversions and stable atmospheric conditions resulting in high carbon monoxide (CO) concentrations and particulate matter (PM).

Summer conditions in the NSVAB are typically characterized by high temperatures and low humidity, with prevailing winds from the south. Summer temperatures average approximately 90° F during the day and 50° F at night.

Winter conditions in the NSVAB are characterized by occasional rainstorms interspersed with stagnant and foggy weather. Winter temperatures average in the low 50s and nighttime temperatures average in the upper 30s. During winter, north winds are more frequent, but winds from the south predominate. Rainfall occurs mainly from late October to early May, averaging around 17 inches per year, but varies significantly for year to year.

The City of Chico is located at an elevation of approximately 240 feet in the northwest portion of Butte County. The annual normal precipitation in the City is approximately 26.32 inches. January temperatures range from a normal minimum of 34.5 °F to a normal maximum of 53.5 °F. July temperatures range from a normal minimum of 60.6°F to a normal maximum of 94.2° F (NOAA 1992). The annual predominant wind direction and speed is from the SSE at 10.5 mph (California ARB 1994).

Atmospheric Stability and Inversions

Stability describes the resistance of the atmosphere to vertical motion. The stability of the atmosphere is dependent upon the vertical distribution of temperature with height. When the temperature decreases vertically at 10 degrees Celsius (°C) per 1,000 meters, the atmosphere is "neutral." When the lapse rate (change in temperature with respect to height) is greater than 10 °C per 1,000 meters, the atmosphere is "unstable." When the lapse rate is less than 10 °C per 1,000 meters, the atmosphere is "stable." Stability categories range from "Extremely Unstable," which are present in the spring and summer with respect to the NSVAB, through "Neutral," to "Stable," which are both present in the fall and winter with respect to the NSVAB. Unstable conditions occur during daytime hours when solar heating warms the lower atmospheric layers sufficiently. Under unstable conditions, large horizontal wind direction fluctuations occur coupled with large vertical mixing depths. Under neutral conditions, solar heating is weak along with horizontal and vertical fluctuations due to a combination of thermal and mechanical turbulence. Under stable conditions, air pollution emitted into the atmosphere will travel downwind with poor dispersion.

An inversion is a layer of warmer air over a layer of cooler air. Inversions influence the mixing depth of the atmosphere, which is the vertical depth available for diluting air pollution near the ground, thus significantly affecting air quality conditions. The NSVAB experiences two types of inversions that affect air quality. The first type of inversion layer contributes to photochemical smog problems by confining pollution to a shallow layer near

the ground. This type occurs in the summer, when sinking air near the ground forms a "lid" over the region. The second type of inversion occurs when the air near the ground cools while the air aloft remains warm. This type of inversion occurs during the winter nights and can cause localized air pollution "hot spots" near emission sources because of poor dispersion. The shallow surface-based inversions are present in the morning, but are often broken by daytime heating of the air layers near the ground.

Air Quality Regulations

Air quality in the City of Chico is regulated by several jurisdictions including the U.S. Environmental Protection Agency (EPA), California Air Resources Board (ARB), and the BCAQMD. The above jurisdictions develop rules, regulations, policies, and/or plans to achieve the goals and directives imposed through legislation, which shall not supersede the EPA, but may be more stringent.

National and State Ambient Air Quality Standards

The EPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for CO, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), respirable particulate matter (PM_{10}), fine particulate matter, and lead, which are referred to as criteria air pollutants. The primary standards protect the public health and the secondary standards protect the public welfare. The California ARB has established California Ambient Air Quality Standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particulates in addition to the criteria air pollutants, which in most cases are more stringent than the NAAQS. The National and California Ambient Air Quality Standards are listed in Table E4.3.2-1.

Butte County Air Quality Management District (BCAQMD) Regulations

The BCAQMD is the agency primarily responsible for assuring that national and state ambient air quality standards are not exceeded and that air quality conditions in Butte County are maintained through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BCAQMD includes, but is not limited to the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the Federal Clean Air Act (FCAA) and the California Clean Air Act (CCAA). In an attempt to achieve national and state ambient air quality standards and maintain air quality, the BCAQMD in coordination with the air districts in the NSVAB has completed air quality attainment plans and reports of which the most recent is the 2003 Air Quality Attainment Plan (AQAP). As required by the CCAA, districts in the NSVAB are required to update the Plan every three years. The next plan is due in 2006 and will incorporate the following general principles to assist air districts with

Table E4.3.2-1
Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status[4,9]	Primary [3,5]	Secondary [3,6]	Attainment Status[7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Moderate)	-[8]	Same as Primary Standard	-[8]
	8-hour	0.07 ppm (137 µg/m^3)	U	0.08 ppm (157 µg/m^3)		N
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	50 µg/m^3 [6]	Same as Primary Standard	U
	24-hour	50 µg/m^3		-[8]		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	Same as Primary Standard	U/A
	24-hour	–	–	35 µg/m^3		
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.25 ppm (470 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1,300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Lead[9]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	
Sulfates	24-hour	25 µg/m^3	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[9]	24-hour	0.01 ppm (26 µg/m^3)	U/A			

Table E4.3.2-1
Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status[4,9]	Primary [3,5]	Secondary [3,6]	Attainment Status[7]
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer —visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

1 National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

2 California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

3 Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

8 The national 1-hour ozone standard was revoked on June 15, 2005. The national annual PM_{10} standard was revoked in September 2006.

9 ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: California ARB 2006a, U.S. EPA 2006a, 2006b

planning processes: 1) air quality modeling to identify the reductions needed and design effective emissions reduction strategies; 2) comprehensive emission reduction programs that take advantage of zero and near zero emission technologies; and 3) address the impacts of pollutant transport in the attainment demonstration (NSVAB 2003).

Attainment Status

The state and national attainment status designations for the NSVAB are presented in Table E4.3.2-1. Butte County is currently designated as a nonattainment area with respect to the state (1-hour) and national (8-hour) ozone standards and the state PM_{10} and $PM_{2.5}$ standards.

Criteria Air Pollutants

The ARB and the EPA currently focus on "criteria pollutants" as indicators of air quality, which include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. A brief description, including adverse health effects and formation processes, of each criteria air pollutant is provided below.

Ozone

Ozone is a photochemical oxidant and the primary component of smog. Ozone is not directly emitted into the air, but formed through complex chemical reactions between precursor emissions of organic compounds and oxides of nitrogen in the presence of sunlight. Both organic compounds and oxides of nitrogen are emitted by mobile (transportation) and stationary (industrial) sources. Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Since sunlight and heat serve as catalysts for the reactions between ozone precursors, peak ozone concentrations typically occur during the summer in the Northern Hemisphere (U.S. EPA 2006a). In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport meteorology, and atmospheric chemistry (Godish 1991).

The adverse health effects associated with exposure to ozone primarily pertain to the respiratory system. Scientific evidence indicates that ambient levels of ozone not only affect sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, shortness of breath, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia leading to an increase in

responsiveness of the respiratory system to bronchoconstrictive challenges, and the interference or inhibition of the immune system's ability to defend against infection (Godish 1991).

Carbon Monoxide

Carbon monoxide is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, principally from mobile (transportation) sources of pollution. In fact, 77% of the nationwide CO emissions are from mobile (transportation) sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources. Peak carbon monoxide levels are localized near areas with high concentrations of mobile (transportation) sources and occur typically during winter months when calm conditions are common.

Carbon monoxide enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, slow reflexes, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (U.S. EPA 2006a).

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban environments. The major anthropogenic (man-made) sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices primarily emit nitric oxide (NO), which reacts oxidatively in the atmosphere to form NO_2 (U.S. EPA 2006a). The combined emissions of NO and NO_2 are referred to as oxides of nitrogen (NO_X), which are reported as equivalent NO_2. Since NO_2 is formed and depleted by reactions associated with photochemical smog (O3), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Since NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depend primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including cough, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, hemoptysis, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has on occasion been linked with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide

Sulfur dioxide is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. Sulfur dioxide is a respiratory irritant with bronchoconstriction occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, sulfur dioxide produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high concentrations of sulfur dioxide may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulates directly emitted into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulates formed in the atmosphere by condensation and/or transformation of sulfur dioxide and reactive organic gases (U.S. EPA 2006a). $PM_{2.5}$ includes a subgroup of finer particle, which have an aerodynamic diameter of 2.5 micrometer or less (California ARB 2006c). The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine particulates, which is referred to as the piggy backing effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated PM_{10} concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations in the body's immune system, carcinogenesis, and premature death (U.S. EPA 2006a). $PM_{2.5}$ poses an increased health risk because they can deposit deep in the lung and contain substances that are particularly harmful to human health. As a result, the U.S. EPA promulgated national $PM_{2.5}$ standards in 1997.

Toxic Air Contaminants

Air quality regulations also focus on Toxic Air Contaminants (TACs), or in federal parlance hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table E4.3.2-1). Instead, the U.S. EPA and California ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by the BCAPCD establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Programs

The U.S. EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed the EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified over 21 TACs, and adopted the EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, the ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

The ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators).

In February 2000, the ARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for 1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines; 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and 3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle (LEV)/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

The ARB recently published the Air Quality and Land Use Handbook: A Community Health Perspective, which provides guidance concerning land use compatibility with TAC sources (California ARB 2005). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities to help keep children and other sensitive populations out of harm's way. A number of comments on the Handbook were provided to the ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether the ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. BCAQMD requires all sources that possess the potential to emit TACs to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BCAQMD limits emissions and public exposure to TACs through a number of programs. The BCAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by the BCAQMD (e.g., health risk assessment) based on their potential to emit toxics. If it is determined that the project would emit toxics in excess of BCAQMD's threshold of significance for TACs, as identified below, sources have to implement the best available control technology for TACs (T-BACT) in order to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, the BCAQMD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that BCAQMD's air quality permitting process applies to stationary sources; and properties, which are exposed to elevated levels of non-stationary type sources of TACs, and the non-stationary type sources themselves (e.g., on-road vehicles) are not subject to air quality permits. Further, due to feasibility and practicality reasons, mobile sources (cars, trucks, etc.) are not required to implement T-BACT, even if they do have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the state and federal level.

Ambient Air Quality

Air pollutant concentrations are measured at several monitoring stations in the NSVAB. The Chico air quality monitoring station located at 468 Manzanita Avenue is located in the immediate vicinity of Bidwell Park and provides sufficient data to meet U.S. EPA and California ARB criteria for quality assurance.

Table E4.3.2-2 summaries the air quality data from 2003 to 2005 for the applicable monitoring station. The state (1-hr) and national (1-hr/8-hr) ozone standards were not exceeded at the air monitoring station during those years. The PM_{10} national standard (24-hr avg, 150 μg/m^3) was not exceeded; however, the state standard (24 hr-avg, 50 μg/ m^3) was exceeded an average of 3.7 measured times per year with an annual average maximum concentration of 81.7 μg/ m^3 from 2003–2005. With respect to the monitoring data for $PM_{2.5}$, the national standard was exceeded once during the last 3 years.

Table E4.3.2-2
Summary of Annual Air Quality Data

	2003	2004	2005
Chico-468 Manzanita Avenue Air Quality Monitoring Station			
Ozone			
State Standard (1-hr/8-hr avg., 0.09/0.07 ppm)			
National Standard (8-hr avg., 0.08 ppm)			
Maximum Concentration (1-hr/8-hr avg., ppm)	0.092/ 0.076	0.088/ 0.073	.0.083/ 0.077
Number of Days State 1-hr Standard Exceeded	0	0	0
Number of Days National 8-hr Standard Exceeded	0	0	0

Table E4.3.2-2
Summary of Annual Air Quality Data

	2003	2004	2005
Respirable Particulate Matter (PM_{10})			
State Standard (24-hr avg., 50 µg/m^3)			
National Standard (24-hr avg., 150 µg/m^3)			
Maximum Concentration (µg/m^3)	54.0	115.0	76.0
Number of Days State Standard Exceeded (Measured[1, 2])	1	5	5
Number of Days National Standard Exceeded (Measured[1, 2])	0	0	0
Fine Particulate Matter ($PM_{2.5}$)			
No Separate State Standard			
National Standard (24-hr avg., 35 µg/m^3)			
Maximum Concentration (µg/m^3)	56.1	76.3	82.7
Number of Days National Standard Exceeded (Measured[1, 2])	0	0	1

1 Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every six days. The number of days above the standard is not necessarily the number of violations of the standard for the year.

2 The number of days a measurement was greater than the level of the national daily standard. Measurements are collected everyday, every three days, or every six days, depending on the time of year and the site's monitor schedule. The number of days above the standards is not directly related to the number of violations of the standard for the year.

ppm = parts per million by volume

µg/m^3 = micrograms per cubic meter

N/A = not available

Source: California ARB 2006b

E4.3.2.2 SIGNIFICANCE CRITERIA

For the purpose of this analysis, the following thresholds of significance, as identified by the State CEQA Guidelines (Appendix G), have been used to determine whether implementation of the proposed project would result in a significant air quality impact. As contained in Appendix G, implementation of the proposed project would result in significant air quality impact if it would:

Conflict with or obstruct implementation of the applicable air quality plans (e.g., Northern Sacramento Valley Air Basin 2003 Air Quality Attainment Plan, Chico Urban Area CO Attainment Plan, and Butte County Air Quality Management District Indirect Source Review Guidelines);

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the State CEQA guidelines, the significance of criteria established by the applicable air quality management or air pollution control district may also be relied upon to make significance determinations. Thus, as contained in the BCAQMD Indirect Source Review Guidelines (BCAQMD 1997) implementation of the proposed project would also result in significant air quality impacts if:

- Construction-generated or long-term operational emissions of ROG or NO_X exceed the BCAQMD's Level A thresholds (25 lb/day of ROG or NO_X, or 80 lb/day PM_{10});
- Sensitive receptors would be exposed to TAC emissions that exceed 10 in 1 million for the carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic Hazard Index of 1 for the Maximally Exposed Individual (MEI).

E4.3.2.3 METHODOLOGY

Potential impacts to air quality resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines pertaining to air quality and determining whether implementation of the BPMMP would result in potentially significant effects on air quality. One of the vegetation management techniques currently used in the Park is controlled burns, which are subject to approval/permitting from the BCAQMD. This management technique would continue under implementation of the BPMMP Update.

Potential impacts resulting from the four Specific Park Improvement Projects in turn were examined for their consistency with the local traffic and circulation planning concepts and the overall BPMMP. Potential impacts consist of direct impacts resulting from project implementation and indirect impacts that could result from altered traffic patterns in the immediate vicinity of the Park.

Short-term construction-generated and long-term operational emissions were assessed qualitatively in accordance with methodologies recommended by ARB and BCAQMD and based on existing reference documentation.

E4.3.2.4 IMPACT DISCUSSION

IMPACT AQ-1: APPLICABLE AIR QUALITY PLANS

Impact AQ-1a: Conflict with or Obstruction of Implementation of the Applicable Air Quality Plan of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term and implementation of the BPMMP itself does not include any significant construction related projects or

any project aspects that would result in changes to current air quality other than as set forth in the four specific Park Improvement Projects, which are discussed below. Controlled burns are still proposed as a management tool. Such burns are subject to permits from the BCAQMD and would not result in new impacts. Implementation of the BPMMP will not result in obstruction of the implementation of local and regional air quality attainment plans and there would be no impact. No mitigation is required. Any future projects proposed will be subject to air quality guidelines established by the City General Plan and BCAQMD for dust suppression and minimization of vehicle emissions. Adherence to these guidelines will ensure that such projects do not result in any significant air quality impacts.

Implementation of the BPMMP would not conflict with or obstruct implementation of any local or regional air quality planning efforts. This impact is considered less than significant. No mitigation is required.

Applies to: BPMMP

Impact AQ-1b: Conflict with or Obstruction of Implementation of the Applicable Air Quality Plan of the Park Improvement Projects

As stated above, Butte County is currently designated a nonattainment area with respect to the state and national ozone (1-hour) standards and the state PM_{10} standard. As discussed in Section E4.3.12, "Transportation and Traffic," the long-term operation of the proposed Park Improvement Projects would not require any additional employees, nor would the number of emergency response vehicle trips increase as a result of the projects. The four Park Improvement Projects aim to better accommodate existing uses and their implementation is not expected to result in a significant number of new trips. Consequently, implementation of the four specific Park Improvement Projects would not result in an increase in vehicle miles traveled and, thus, would not conflict with or obstruct implementation of BCAQMD's air quality planning efforts. Furthermore, construction of the four specific Park Improvement Projects is not anticipated to result in the operation of any major stationary emission sources.

Implementation of the four specific Park Improvement Projects would not conflict with or obstruct implementation of any local or regional air quality planning efforts. This impact is considered less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AQ-2: VIOLATION OF STANDARDS

Impact AQ-2a: Violation of Air Quality Standard or Substantial Contribution to an Existing or Projected Air Quality Violation of the BPMMP

Short-Term Construction Emissions

BPMMP

As stated above, the BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term, and implementation of the BPMMP itself does not include any construction related projects or any project aspects that would result in changes to current air quality other than the four specific Park Improvement Projects that are analyzed below.

Implementation of the BPMMP will not result in any construction activities, therefore there would be no impact resulting from short term construction emissions. No mitigation is required.

Applies to: BPMMP

Impact AQ-2b: Violation of Air Quality Standard or Substantial Contribution to an Existing or Projected Air Quality Violation of the Park Improvement Projects

Construction emissions are described as "short term" or temporary in duration and have the potential to represent a significant impact with respect to air quality, especially fugitive dust emissions (PM_{10}). Fugitive dust emissions are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles on-site and off-site. Emissions of ozone precursors ROG and NO_X are primarily associated with gas and diesel equipment exhaust and the application of architectural coatings. With respect to the four specific Park Improvement Projects, construction of trails, parking lots, picnic areas, scenic overlooks, and disc golf tees and structures would result in the temporary generation of ROG, NO_X, and PM_{10} emissions from site preparation (e.g., excavation, grading, and clearing), material transport (especially on unpaved surfaces), trail construction, trenching, laying of concrete foundations, paving, equipment installation, finishing, cleanup, and other miscellaneous activities.

Short-term construction-generated emissions of ROG, NO_X, and PM_{10} were modeled for construction of the project using the Road Construction Emissions Model Version 5.2 (SMAQMD 2006) as recommended for linear-type construction projects (e.g., bridges and trails), and other emission factors and recommended methodologies from BCAQMD's Indirect Source Review Guidelines (BCAQMD 1997). The modeled daily construction emissions are summarized in Table E4.3.2-3 and described in more detail below and in Appendix E2.

Table E4.3.2-3 Summary of Modeled Worst-Case Short-Term Construction-Generated Emissions			
Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Construction of the four Park Improvement Projects			
Grubbing/Land Clearing	10	55	13
Grading/Excavation	1	3	10
Drainage/Utilities/Sub-Grade	1	0	10
Paving	1	0	0
Maximum (pounds/day)	**10**	**55**	**13**
BCAQMD Level B Significance Thresholds	**25**	**25**	**80**
BCAQMD Level C Significance Thresholds	**137**	**137**	**137**

See Appendix E2 for modeling results and assumptions.
Source: Data Modeled by EDAW 2006

Projects would be constructed as funding becomes available over a 20 year planning horizon. It is not anticipated that any of the four projects would be constructed simultaneously. Worst-case assumptions were made for modeling purposes. In order to be conservative, it was assumed that all projects would be constructed back-to-back during a one year period (as stated above, projects would likely occur over an extended timeframe as funding becomes available). It was assumed that construction would take place during 2008, as emission factors for a construction fleet acquired at that time would be higher than in future years, due to more restrictive emission standards becoming applicable over time. Detailed on-site construction equipment is not known at this time, but could include trucks, a trail builder, graders, scrapers, paving equipment, dozers, loaders, excavators, and other miscellaneous construction equipment.

Based on the modeling conducted, construction of the four Park Improvement Projects would result in worst-case maximum unmitigated daily emissions of approximately 10 lb/day of ROG, 55 lb/day of NO_X, and 13 lb/day of PM_{10}. Daily unmitigated emissions of NO_X would exceed BCAQMD's level B significance threshold of 25 lb/day. No project-generated construction-related emissions would exceed BCAQMD's level C threshold of 137 lb/day of ROG, NO_X, or PM_{10}. Because BCAQMD's standard mitigation measures are not incorporated into the project description, construction-generated emissions could violate an air quality standard or contribute substantially to an existing or projected air quality violation. Thus, this impact is considered potentially significant and is subject to mitigation.

Mitigation Measure AQ-2: Control Short-term Construction Emissions

Consistent with BCAQMD guidelines, the following measures shall be implemented to reduce potentially significant effects on air quality resulting from construction related to the four specific Park Improvement Projects:

- Alternatives to open burning of vegetative material removed from a project site shall be used unless otherwise deemed infeasible by the AQMD. Among suitable alternatives are chipping, mulching, or conversion to biomass fuel;

- Adequate and applicable dust control measures (identified in detail below) shall be implemented during all phases of project development and construction as outlined below:

    - All active construction sites shall be watered at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.

    - Chemical soil stabilizers shall be applied to inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).

    - On-site vehicles speeds shall be limited to a speed of 15 mph on unpaved roads.

    - Land clearing, grading, earth moving or excavation activities shall be suspended when winds exceed 20 miles per hour.

    - Non-toxic binders (e.g., latex acrylic copolymer) shall be applied to exposed areas after cut and fill operations and the area shall be hydroseeded.

    - Vegetative ground cover shall be planted in disturbed areas as soon as possible after disturbance.

    - Inactive storage piles shall be covered.

- Paved streets adjacent to each project site shall be swept or washed at the end of each day as necessary to remove excessive accumulations of silt and/or mud which may have accumulated as a result of activities on the project site.

- A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 24 hours if a complaint is received. The telephone number of the BCAQMD shall also be visible to ensure compliance with BCAQMD Rule 201 & 207 (Nuisance and Fugitive Dust Emissions).

Timing/Implementation: During construction activities

Responsible Party: City of Chico

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Implementation of Mitigation Measure AQ-2 would reduce direct and cumulative impacts on air quality resulting from construction of the four specific Park Improvement Projects to less than significant.

IMPACT AQ-3: LONG-TERM OPERATIONAL EMISSIONS

Impact AQ-3a: Long Term Operation Emissions of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term, and implementation of the BPMMP itself does not include any elements that would be expected to result in new long-term operations emissions other than the four specific Park Implementation Projects discussed below. The BPMMP provides guidance for the overall management of the Park. Any future projects other than the four Park Improvement Projects discussed in detail in this document will undergo environmental review and, if applicable, will be subject to similar mitigation measures as described within this section.

Implementation of the BPMMP will not result in the generation of long-term operational emissions; therefore there would be no impact. No mitigation would be required.

Applies to: BPMMP

Impact AQ-3b: Long Term Operation Emissions of the Park Improvement Projects

The operation of the four specific Park Improvement Projects is not expected to result in a net increase of long-term regional ROG, NO_X, or PM_{10}, or local carbon monoxide emissions from area or mobile sources. Once the concept plans have been constructed, the long-term operation of the upgraded facilities and trails would not require any additional park employees, and, thus, would not result in any associated employee commute trip emissions of criteria air pollutant (e.g., PM_{10}) or ozone precursor emissions (e.g., ROG and NO_X). While upgrades of the sites associated with the four Park Improvement Project will formalize the status of the sites as destinations in the Park and therefore may attract some additional visitors to the respective sites, it is anticipated that the increase in potential users of the Park Improvements Projects would only result in negligible additional trip generation from recreational users, as the projects are mostly aimed at accommodating existing uses. Area source emissions associated with landscaping and maintenance activities of the upgraded facilities and trails would take place at generally the same level as without the four specific Park Improvement Projects. Furthermore, implementation of the four Park Improvement Projects would not result in the operation of new major stationary emission sources.

Implementation of the four specific Park Improvement Projects would not result in long-term operational emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation. This impact is less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AQ-4: CUMULATIVE AIR QUALITY CONSIDERATIONS

Impact AQ-4a: Cumulatively Considerable Net Increase of any Criteria Pollutant for which the Project Region is Non attainment under an Applicable Federal or State Ambient Air Quality Standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term, and implementation of the BPMMP itself does not include any elements that would result in a considerable net increase in pollutant for which the project region is nonattainment.

Implementation of the BPMMP will not result in a considerable net increase in pollutant for which the project region is non attainment and therefore there would be no impact. No mitigation is required.

Applies to: BPMMP

Impact AQ-4b: Cumulatively Considerable Net Increase of any Criteria Pollutant for which the Project Region is Non attainment Under an Applicable Federal or State Ambient Air Quality Standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) of the Park Improvement Projects

As discussed under Impact AQ-2b and AQ-3b above, implementation of the four Park Improvement Projects would not result in long-term operational ROG, NO_X, PM_{10}, or CO emissions that would result in or contribute substantially to an air quality violation. However, because mitigation measures outlined above for short term construction related impacts are not currently incorporated into the project description for the four specific Park Improvement Projects, temporary construction emissions could violate or contribute substantially to an existing or projected air quality violation, especially considering the region's nonattainment status for ozone and PM_{10}.

Construction-generated ozone precursor (ROG and NO_X) emissions and PM_{10} emissions resulting from implementation of the four specific Park Improvement Projects could result in a cumulatively considerable net increase of a criteria pollutant for which the project region is nonattainment under any applicable federal or state ambient air quality standards. This impact is considered potentially significant and requires mitigation.

Implementation of Mitigation Measure AQ-2 described above would reduce cumulative impacts from short-term construction-generated emissions to less than significant.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT AQ-5: SENSITIVE RECEPTORS

Impact AQ-5a: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term. Implementation of the policies contained within the BPMMP will not result in the exposure of sensitive receptors to substantial pollutant concentration. Any future projects other than the four Park Improvement Projects discussed in detail in this document will undergo environmental review and, if applicable, will be subject to similar mitigation measures as described n this section.

Implementation of the BPMMP policies would result in no impact. No mitigation is required.

Applies to: BPMMP

Impact AQ-5b: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations of the Park Improvement Projects

Criteria Air Pollutant and Precursor Emissions (ROG, NO_X, PM_{10}, and CO)

Sensitive receptors in the vicinity of the proposed project include residences adjacent to the Cedar Grove Area residences adjacent to the southwest portion of the Trails Plan Area, and one residential home adjacent to the eastern portion of the Disc Golf/Trailhead Area. As discussed in AQ-2b and AQ-3b above, project implementation would not result in long-term operational ROG, NO_X, PM_{10}, or local CO emissions that would result in or contribute substantially to an air quality violation. However, because BCAQMD recommended mitigation measures are not currently incorporated into the project description, temporary construction emissions could violate or contribute substantially to an existing or projected air quality violation. Thus, construction-generated ozone and PM_{10} emissions could expose receptors to substantial pollutant concentrations. As a result, this impact is considered potentially significant and would require mitigation. Implementation of the Mitigation Measure AQ-2b, as described above, would reduce short-term construction-generated emissions to a less than significant level.

Toxic Air Contaminant Emissions

Short-Term Construction Sources

Construction of each of the four Park Improvement Projects would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by the ARB in 1998. Construction of individual projects would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, and other construction activities. The dose to which receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project. Thus, because the use of mobilized equipment would be temporary (less than 2% of the exposure period) in combination with the dispersive properties of diesel PM (Zhu and Hinds 2002), and the fact that the project sites are small and would only require the use of a few pieces of equipment and no atypical construction activities (e.g., large amount of soil import/export with heavy-duty trucks) would occur, short-term construction activities would not expose sensitive receptors to substantial pollutant concentrations.

This impact is considered less than significant. No mitigation is required.

Long-Term Operational Sources

With respect to mobile-source TAC emissions, the operation of the Park Improvement Projects, once built, would not result in a net increase of long-term emissions from mobile sources. The long-term operation of the Park Improvement Projects would not require any additional employees, and, thus, would not result in any associated employee commute or significant increased Park user trip emissions of TACs. Furthermore, project implementation would not result in the operation of any new major stationary emission sources of TACs. The Park Improvement Projects aim to better accommodate existing uses and their implementation is not expected to result in a significant number of new trips.

This impact is considered less than significant. No mitigation is required.

IMPACT AQ-6: OBJECTIONABLE ODORS

Impact AQ-6a: Creation of Objectionable Odors Affecting a Substantial Number of People of the BPMMP

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term, and implementation of the BPMMP itself does not include any elements that would result the emission of odors.

Implementation of the BPMMP will not result in the emission of odors therefore there would be no impact. No mitigation is required.

Applies to: BPMMP

Impact AQ6b: Creation of Objectionable Odors Affecting a Substantial Number of People of the Park Improvement Projects

Implementation of the four Park Improvement Projects would not result in any major sources of odor and the project types are not one of the common types of facilities that are known to produce odors (e.g., landfill, coffee roaster, wastewater treatment facility). In addition, the diesel exhaust being generated by construction equipment used during implementation of the four specific Park Improvement Projects would be intermittent and temporary, and would dissipate rapidly from the source with an increase in distance. Finally, as mentioned previously, only a few pieces of construction equipment would be in operation at any one time.

Implementation of the four Park Improvement Projects would not create objectionable odors affecting a substantial number of people and there would be no impact. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM AQ-1

Implementation of the BPMMP and associated Park Improvement Projects would not result in significant adverse effects on local and regional air quality and no cumulative impacts will occur.

E4.3.3 BIOLOGICAL RESOURCES

E4.3.3.1 ENVIRONMENTAL SETTING

The following discussion of existing conditions constitutes a summary of the existing biological setting relevant to the impacts and mitigation measures that follow. Significantly more detailed existing conditions information regarding the biological resources in Bidwell Park can be found in Section 2.3.2 of the BPMMP. Goals, Objectives, Implementation Strategies, and Guidelines pertaining to biological resources are located in Section 3.5.3.2 of the BPMMP. More detailed information about management of oak woodlands, invasive plants, and fire ecology is found in the NRMP (Appendix C). Regulatory information pertaining to biological resources is included in the Regulatory Framework (Appendix I) and in the City of Chico General Plan Goals and Policies and Municipal Codes (Appendix J).

Special-Status Plant Species

Summary

Based on searches of the California Department of Fish and Game's (DFG's) California Natural Diversity Database (CNDDB) (2005), the California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Plants (CNPS 2005), and the habitat types present within the Park, 39 special-status plant species have the potential to occur in Bidwell Park. Table 2.3.2-2 in the BPMMP lists these species and provides information on their federal, state, and CNPS listing status, habitat, distribution, flowering period, and potential for presence within the Park. Descriptions of special-status plants that are federally or state listed as endangered or threatened or are known to occur in Bidwell Park, as well as species that have high potential to occur in Bidwell Park, are also provided in Section 2.3.2 of the BPMMP. Known populations of special-status plant species are depicted in Exhibit 2.3.2-2b of the BPMMP.

Four plant species listed on CNPS Lists 1 or 2 have been documented within the Park to date:

- Butte County calycadenia (*Calycadenia oppositifolia*),
- rose-mallow (*Hibiscus lasiocarpus*),
- California beaked-rush (*Rhynchospora californica*), and
- Butte County checkerbloom (*Sidalcea robusta*).

Seven plant species that are included on CNPS List 4 are known to be present in Bidwell Park:

- depauperate milkvetch (*Astragalus pauperculus*),
- small spikerush (*Eleocharis parvula*),
- Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*),

- woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*),
- shield-bracted monkeyflower (*Mimulus glaucescens*),
- Tehama navarretia (*Navarretia heterandra*), and
- Bidwell's knotweed (*Polygonum bidwelliae*).

Existing conditions for Butte County checkerbloom and Bidwell's knotweed are described in further detail below because of the potential of the four Park Improvement Projects to affect these species.

No occurrences of federally listed or state-listed plant species have been documented in the Park to date, but there is low to moderate potential for several listed species to be located in the Park as indicated in Table 2.3.2-2 of the BPMMP.

Focused botanical surveys have been conducted for the Disc Golf/Trailhead Area site and for other small portions of the Park in support of previously proposed projects (CSU Research Foundation 2000; Stuart 2002, 2003; EDAW 2005), but not for the entire Park. Focused surveys of the entire Park would be necessary to precisely determine the distribution and extent of special-status plant species, but sufficient information is known about habitats and resource conditions to have an adequate understanding for purposes of the environmental review in this Program EIR.

Butte County Checkerbloom

Butte County checkerbloom is a CNPS List 1B species. This perennial herb species is a member of the mallow family (Malvaceae) and has a robust stem that typically grows up to 3 feet high. Pale pink flowers with petals measuring up to 1.5 inches bloom from April to June. Mapping of known and historic occurrences show that the species is restricted to the relatively young soils of the Tuscan Formation in the southern Cascade Range foothills (Hantelman, pers. comm., 2005). It is often found growing under blue oak trees or under shrubs (at dripline or base of trunk), against rocks or at the base of ledges or rock benches, in small drainages, and in other similar habitats. Although it is found in a variety of slopes and exposures, it is found more frequently on north-facing slopes of 20% or more (Hantelman, pers. comm., 2005). This plant occupies almost exclusively blue oak and blue oak/foothill pine woodland (Hantelman, pers. comm., 2005).

Special-status plant surveys conducted in 2000 (CSU Research Foundation 2000) and in 2002 and 2003 (Stuart 2002, 2003) documented more than 300 locations of Butte County checkerbloom in Upper Park, and additional locations were identified during special-status plant surveys conducted at the proposed Disc Golf/Trailhead area in 2005 (EDAW 2005). Populations have ranged in size from a single individual to several hundred individuals. Locations of Butte County checkerbloom within the Disc Golf/Trailhead Area Concept Plan area are provided in Exhibit 4 in Appendix E3. These data were used during the design of the three potential layouts for the Disc Golf/

Trailhead Area Concept Plan. Outside of Bidwell Park the total number of populations is not known, although the plant is likely restricted to a small number of sites (Hantelman, pers. comm., 2005).

Bidwell's Knotweed

Bidwell's Knotweed (*Polygonum bidwelliae*) is a CNPS List 4 species. This annual herb species is a member of the knotweed family (Polygonaceae) and has an erect reddish stem that is 1–8 inches tall. Plants produce tiny pink flowers that typically bloom between April and June. This species occurs in thin volcanic soils on gravelly ridge tops and outcrops of the Tuscan Formation at elevations ranging from 200 to 4,000 feet. Several occurrences of Bidwell's knotweed have been documented within Upper Park (CSU Research Foundation 2000; Stuart 2002, 2003; EDAW 2005), and the original type specimen was collected by Annie Bidwell from the area of the Disc Golf/Trailhead Area Concept Plan. Outside of Bidwell Park, this species is known from roughly 30–50 sites scattered from Butte County to Shasta County, some of which may no longer be extant. This species is abundant in the wildflower field community in the Disc Golf/Trailhead and Horseshoe Lake areas. However, focused special-status plant surveys have not been conducted for the Horseshoe Lake area or the full extent of the Trails Plan area, so other populations of Bidwell's knotweed could be present in potential disturbance areas. Locations of Bidwell's knotweed within the Disc Golf/Trailhead area are shown in Exhibit 4 in Appendix E3.

Special-Status Wildlife Species

Summary

Special-status wildlife species with potential to occur in Bidwell Park were identified through a review of existing documentation and reconnaissance-level field surveys conducted by an EDAW wildlife biologist on March 9 and May 5, 2005. Sources of information reviewed included the CNDDB (2005), *A Resource Inventory of Upper Bidwell Park Expansion Area* (CSU Research Foundation 2000), Big Chico Creek Watershed Alliance's (BCCWA) Existing Conditions Report (BCCWA 1997), biological resource information provided on the Friends of Bidwell Park Web site (http://www.friendsofbidwellpark.org), and a current U.S. Fish and Wildlife Service (USFWS) list of threatened, endangered, proposed, and candidate species that may be present in the area.

A thorough inventory of, or focused surveys for, wildlife have not been completed for Bidwell Park. However, based on the results of a field reconnaissance of habitats and other biological studies, it has been determined that Bidwell Park may provide important habitat for several special-status terrestrial animal species. A list of special-status animal species known or likely to visit or inhabit Bidwell Park and a summary of their habitat associations and regulatory status is included in Table 2.3.2-3 of the BPMMP. Special-status wildlife species that are state or federally listed as threatened or endangered, as well as special-status species that are known to occur in Bidwell Park are discussed in Section 2.3.2.3 of the BPMMP. Existing conditions for special-status wildlife species with potential to be affected by the Park Improvement Projects are described below.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is federally listed as threatened. These beetles are patchily distributed throughout the remaining riparian forests of the Central Valley, from Redding to Bakersfield. They appear to be only locally common (i.e., found in population clusters that are not evenly distributed across the Central Valley). Although wide-ranging, the valley elderberry longhorn beetle has been thought to be in a long-term decline due to human activities that have resulted in widespread alteration and fragmentation of riparian habitats and, to a lesser extent, upland habitats that support the beetle (USFWS 1984). USFWS released a 5-year status review for the valley elderberry longhorn beetle on October 2, 2006 (USFWS 2006a). This review reported an increase in known beetle locations from 10 at the time of listing in 1980 to 190 in 2006. Because of this observed population increase and the concurrent protection and restoration of several thousand acres of riparian habitat suitable for valley elderberry longhorn beetles, the USFWS status review determined that this species is no longer in danger of extinction, and recommended that the species no longer be listed under the ESA. This recommendation is not a guarantee that the species will be delisted, however, because formal changes in the classification of listed species require a separate USFWS rulemaking process distinct from the 5-year review. If valley elderberry longhorn beetles are removed from the ESA list, it will likely be more than a year before this decision is finalized.

Valley elderberry longhorn beetles require blue elderberry shrubs for reproduction and survival and are rarely seen because they spend most of their life cycle as larvae within the stems of the shrubs. Females lay their eggs on the bark; larvae hatch and burrow into the stems. The larval stage may last 2 years, after which the larvae enter the pupal stage and transform into adults. Adults are active (feeding and mating) from March to June (USFWS 1984). It appears that in order to function as habitat for the valley elderberry longhorn beetle, host elderberry shrubs must have stems that are 1.0 inch or greater in diameter at ground level. Use of the plants by the beetle is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just before the pupal stage.

Valley elderberry longhorn beetle has been documented at several locations within the Park, including locations in Middle Park along Big Chico Creek in the vicinity of Horseshoe Lake (CNDDB 2005). However, no parkwide inventory of Valley elderberry longhorn beetle (VELB) has been conducted, so elderberry shrubs may exist elsewhere in the Park.

Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Conservancy Fairy Shrimp

Vernal pool tadpole shrimp (*Lepidurus packardi*) and Conservancy fairy shrimp (*Branchinecta conservatio*) are federally listed as endangered; vernal pool fairy shrimp (*Branchinecta lynchi*) is federally listed as threatened. These are small crustaceans (½–2 inches long) that are restricted to vernal pools, swales, and other seasonal pools.

Eggs of the species lie dormant during most of the year in the form of cysts, which are capable of withstanding extreme environmental conditions, such as heat, cold, and prolonged desiccation. The cysts hatch when the pools fill with rainwater, and the young rapidly develop into sexually mature adults. Not all of the cysts hatch with the first rainfall; some remain dormant to hatch during subsequent events or in later years.

Generally, vernal pool invertebrates occupy a variety of seasonal aquatic habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Conservancy fairy shrimp are associated more with highly turbid vernal pools. Vernal pool invertebrates can live in wetlands ranging from small pools several square feet in area to large vernal lakes of more than 50 acres (USFWS 2005). Habitat for vernal pool invertebrates has become highly fragmented and continues to be threatened by conversion to urban and agricultural uses. Almost three-quarters of vernal pool habitat in the Central Valley were estimated to have been lost by 1997 (USFWS 2005). Vernal pool fairy shrimp, vernal pool tadpole shrimp, and Conservancy fairy shrimp have not been documented in the Park, but the vernal pools present around Horseshoe Lake and on the south rim near the Disc Golf/Trailhead Area provide potentially suitable habitat for this species.

Western Spadefoot

Western Spadefoot (*Spea hammondii*) is a DFG species of special concern. This species occurs in dry shortgrass grassland habitat close to seasonal wetlands such as vernal pools. Although spadefoot populations primarily occur in grassland settings, they occasionally occur in valley-foothill woodlands (Zeiner et al. 1988). Western spadefoots require seasonal wetlands for reproduction and metamorphosis. The specific physical attributes that make such wetlands suitable for spadefoots are not well known, but such attributes probably include ponds with sufficient depth and surface area to persist at least several weeks, submerged vegetation, and possibly a large invertebrate macrofauna to support spadefoot tadpoles, which are sometimes carnivorous (Stebbins 1951, Jennings and Hayes 1994, Morey 1998). Wetlands that sustain spadefoot recruitment generally lack introduced aquatic predators such as centrarchid fishes, mosquitofish, bullfrogs, and crayfish (Jennings and Hayes 1994). Western spadefoot has not been documented in Bidwell Park; however suitable vernal pool habitat occurs there and this species is known from adjacent sites (Shedd 2005).

Northwestern Pond Turtle

Northwestern pond turtle is a DFG species of special concern. This species is generally associated with permanent or near-permanent aquatic habitats, such as lakes, ponds, streams, freshwater marshes, and agricultural ditches. They require still or slow-moving water with instream emergent woody debris, rocks, or similar features for basking sites. Pond turtles are highly aquatic but can venture far from water for egg-laying. Nests are typically located on unshaded upland slopes in dry substrates with clay or silt soils (Jennings and Hayes 1994). Pond turtle is known to occur in and near Big Chico Creek, most commonly in the foothills of Upper Park (Shedd 2005).

American Peregrine Falcon

American peregrine falcon (*Falco peregrinus anatum*) is state listed as endangered. This species breeds along the coast and in the mountains of California and is a winter resident of the Central Valley, migrating into the region around September and leaving around April or May. In winter, American peregrine falcons occur in open grasslands, agricultural fields, desert sagebrush flats, and similar open country in low-lying valleys and foothills. They commonly occur in habitats associated with tall cliffs, wide open views, and a nearby water body. Typical nesting sites include cliffs, ledges, caves, crevices, and small holes. They feed primarily on waterfowl, shorebirds, seabirds and other birds but occasionally feed on mammals, insects, and fish.

The tall cliffs and open woodlands, savannas, and grasslands along with the nearby water source of Big Chico Creek make Upper Bidwell Park excellent habitat for peregrine falcon. During the field survey conducted on March 9, 2005, a peregrine falcon pair was observed copulating on a cliff below the southern ridgetop, adjacent to the Disc Golf/Trailhead Area Concept Plan area in Upper Bidwell Park. During a follow-up survey on May 5, 2005, the pair was observed using the same cliff location consistently.

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) is federally listed as threatened and state listed as endangered and is a California fully protected species. It is currently proposed for delisting under the ESA. Bald eagles are typically associated with permanent water bodies (e.g., lakes, reservoirs, rivers) with nearby perching, roosting, and nesting sites such as snags and large rocks. They feed primarily on fish, but will also prey on mammals, water birds, and carrion. Bald eagles have been observed in Bidwell Park, mostly in Upper Park. They are not known to breed in the Park (Johnson, pers. comm., 2006).

Golden Eagle

Golden eagle (*Aquila chrysaetos*) is a California fully protected species and DFG species of special concern. Typical breeding habitat for golden eagles includes steep cliffs and medium to tall trees in open woodland with nearby grasslands for foraging. Outside of the breeding season, golden eagles frequently move into agricultural lands, grasslands, chaparral, sagebrush flats, savannas, desert edges, and montane valleys. They avoid dense coastal and montane coniferous forests. Golden eagles feed primarily on small mammals but also prey on birds and occasionally on large mammals. This species has been observed in Upper Park. They are not known to breed in the Park, but suitable breeding habitat is present in the bluffs of the Tuscan formation (Johnson, pers. comm., 2006), including those in the vicinity of the Disc Golf/Trailhead and Horseshoe Lake areas.

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is a California fully protected species and a federal species of special concern. White-tailed kites forage in open grasslands, meadows, farmlands, and emergent wetlands. They nest in trees in grasslands, agricultural lands, wetlands, oak woodland, oak savanna, and riparian habitats associated with open areas. Nest sites range from relatively small isolated trees to large woodland patches. This species has been documented in Bidwell Park. It is known to breed in the Bruce Road area outside the Park and possibly in Middle Park (Johnson, pers. comm., 2006).

Northern Harrier

Northern harrier (*Circus cyaneus*) is a DFG species of special concern. Northern harriers frequent grasslands, wetlands, and other open habitats and are seldom found in wooded areas. They nest on the ground in dense, low-lying vegetation, typically in wetland habitats, but also in grasslands and grain fields. Northern harriers are year-round residents in the Central Valley, typically found in marshes and agricultural areas. This species has been observed in open areas in Middle and Upper Park. It is not known to breed in the Park (Johnson, pers. comm., 2006), but suitable habitat is provided by Park grasslands.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperii*) is a DFG species of special concern. Cooper's hawks occur in riparian and other woodland habitats. Though rarely found in areas without at least patchy woodland habitat, Cooper's hawks are known to sometimes hunt in parks and residential areas that support trees. In winter, they also forage in open fields. This species typically nests in riparian and other woodland habitat, but nests can also be found in isolated groves of trees. Cooper's hawk is a year-round resident throughout most of the state, although individuals from more northern areas also migrate into California for the winter. This species has been observed in Bidwell Park, but most likely breeds in the mountain region above the eastern park boundary (Johnson, pers. comm., 2006).

Sharp-shinned Hawk

Sharp-shinned hawk (*Accipiter striatus*) is a DFG species of special concern. The range of this species in California extends throughout the length of the state but breeding populations in California are rare and are apparently restricted to the northern portion of the state. Sharp-shinned hawks are uncommon to fairly common transient and winter visitors to the state from mid-September to mid-April (Small 1994). This species nests in coniferous or mixed forest habitats and typically nests in conifer trees. Foraging habitat includes a variety of coniferous, mixed, or deciduous forest types. Sharp-shinned hawks prey primarily on small birds but also eat rodents and insects. Sharp-shinned hawks have been observed in all sections of Bidwell Park but mostly breed in the mountain regions to the east of the park boundary (Johnson pers. comm., 2006).

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a DFG species of special concern. Throughout their life cycle, burrowing owls require habitat with three basic attributes: open, well-drained terrain outside areas at risk of flooding; short, sparse vegetation; and underground burrows or burrow facsimiles. Burrowing owls inhabit grasslands, deserts, sagebrush scrub, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands, and urban vacant lots, as well as the undeveloped margins of airports, golf courses, roads, and railroad beds. Burrowing owls typically occur in habitats with less than 30% tree or shrub cover (DeSante et al. 1996). In California, four community types most frequently occupied by burrowing owls are: grasslands adjacent to intensive agriculture; intensive agriculture where owls nest along irrigation banks; large, unfragmented grasslands; and small grassland and ruderal patches surrounded by and adjacent to urban development (Rosenberg and DeSante 1997, Rosenberg 2003). The proximity of nest sites to suitable foraging habitat is especially important, as burrowing owls tend to forage near their burrows (Gervais et al. 2003).

The most important habitat consideration for burrowing owls is the availability of underground burrows throughout their life cycle. While western burrowing owls nest and roost in these burrows, they do not typically create them. Throughout their range, they use burrows excavated by fossorial mammals or reptiles, including ground squirrels, prairie dogs, badgers, skunks, armadillos, marmots, foxes, coyotes, and tortoises (Karalus and Eckert 1987). In the Central Valley of California, burrowing owl occurrence is closely associated with the presence and abundance of ground squirrel populations. Where the number and availability of natural burrows are limited (e.g., where burrows have been destroyed or ground squirrels eradicated), owls may occupy other natural and unnatural sites such as rock outcrops (Gleason and Johnson 1985, Rich 1986), concrete and asphalt (Trulio 1994), cavities under piles of rubble, drainage culverts, discarded pipe and other tunnel-like structures, and human-made artificial burrows (Collins and Landry 1977).

Burrowing owls have been documented in the Big Chico Creek watershed and are likely to occur in Bidwell Park.

Yellow Warbler, Yellow-Breasted Chat, and Western Yellow-Billed Cuckoo

Yellow warbler (*Dendroica petechia*) and yellow-breasted chat (*Icteria virens*) are both DFG species of special concern. Yellow warblers typically nest in riparian deciduous habitats with small trees and shrubs typical of low, open-canopy riparian woodland (Zenier et a. 1990). Yellow-breasted chats typically nest in riparian habitats with a dense shrub layer. Both of these species are known to occur in Bidwell Park along Big Chico Creek.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is state listed as endangered and is a candidate for federal listing. This species requires large patches (25 acres or larger) of mixed old-growth riparian forests composed of willow and cottonwood trees with dense understory. Foraging occurs in cottonwood trees while nesting occurs almost exclusively in willows. The historic range of this species spanned throughout the state, and

cuckoos were widespread and abundant until the early 1900s. It is currently estimated that only 50 to 75 pairs breed in California annually (Small 1994) and these are restricted to the remaining stands of old growth riparian forest. The largest stands of suitable habitat occur along the upper Sacramento River between Red Bluff and Colusa, including portions of Glenn, Sutter, and Butte Counties. Other significant breeding areas occur along the Colorado River in Riverside County and the South Kern River Preserve in Kern County. There are known occurrences in Butte Sink on the Feather River in Sutter and Butte Counties, along the Amargosa River and Baker Creek in Inyo County, and at Mojave Narrows in San Bernardino County (Small 1994). There are no recorded occurrences of this species within Bidwell Park; however suitable habitat is present along Big Chico Creek.

California Black Rail

California black rail (*Laterallus jamaicensis coturniculus*) is state listed as threatened and is a DFG fully protected species. Its historic distribution in California included the San Francisco Bay area; the Sacramento and San Joaquin Deltas and coastal areas south to northern Baja, California; and inland areas of southern California, including the Salton Sea, Riverside and San Bernardino areas, and along the lower Colorado River. In 1994, a black rail population was discovered in the Sierra Nevada foothills in Butte County (Aigner et al. 1995). Surveys conducted since then documented scattered populations in freshwater marshes in Butte, Nevada, Yuba and Placer Counties (Tecklin 2000, J. Tecklin unpublished data). Over its range, California black rail is associated with freshwater, brackish/tidal, and pickleweed salt marsh. Interior foothill populations of black rail use freshwater marshes typically dominated by cattail (*Typha* spp.) or bulrush (*Scirpus* spp.).

Black rail is known to occur in Bidwell Park. In 2006, five black rails were detected in a seep spring marsh above Bear Hole, on the north side of Big Chico Creek (Johnson, pers. comm., 2006).

Loggerhead Shrike

Loggerhead shrike (*Lanius ludovicianus*) is a DFG species of special concern. Loggerhead shrikes occur in dry, open habitats including grasslands, pastures with fence rows, agricultural fields, open woodlands (savannahs), scrub, and riparian areas. Suitable breeding habitat has the following characteristics: 1) short, sparse vegetation; 2) scattered or isolated low trees or large shrubs for nest sites; and 2) available hunting perches with an open view (Yosef 1996, Cade and Woods 1997). Loggerhead shrikes typically avoid completely treeless and shrubless areas (Cade and Woods 1997), and urbanized and densely wooded areas (Grinnell and Miller 1944). Winter foraging habitat is similar to summer breeding ad foraging habitat, however shrikes additionally use idle pastures and hayfields in the winter (Bartgis 1992). In many areas, Loggerhead shrike abundance is correlated with the amount of pastureland and available perches (Gawlik and Bildstein 1993, Yosef 1996). Hunting perches are especially important for Loggerhead shrike foraging (Brooks and Temple 1990, Yosef and Grubb 1994).

This species is known from the areas around the North Rim Trail, Horseshoe Lake and the diversion channel. Loggerhead shrikes likely breed in Bidwell Park (Johnson, pers. com., 2006).

Special-Status Fish Species

A list of special-status fish species known from or with potential to occur in Big Chico Creek within Bidwell Park is included in Table 2.3.2.4-3 of the BPMMP. The BPMMP contains several objectives and implementing strategies and guidelines aimed at protecting and enhancing aquatic habitat and associated resources within the Park.

Riparian Habitats and Other Sensitive Natural Communities

Summary

Sensitive natural communities include those that are of special concern to resource agencies or are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, Section 404 of the federal Clean Water Act (CWA), and the State's Porter-Cologne Act, as discussed in Appendix I (Regulatory Framework) of the BPMMP. Sensitive natural communities may be of special concern to these agencies and conservation organizations for a variety of reasons, including their regionally or locally declining status, or because they provide important habitat to common and special-status species. Many of these communities are tracked in DFG's CNDDB, a statewide inventory of the locations and conditions of the state's rarest plant and animal taxa and vegetation types. Sensitive natural communities present within Bidwell Park include riparian forest, oak woodland, wildflower field, and wetlands, including northern volcanic mudflow vernal pool.

Existing conditions for those sensitive natural communities with the greatest potential to be affected by the four Park Improvement Projects are described below.

Riparian Forest

Based on habitat mapping conducted in support of the preparation of the BPMMP, Bidwell Park contains approximately 295.86 acres of Great Valley mixed riparian forest, 56.09 acres of Great Valley valley oak riparian forest, and 21.15 acres of white alder riparian forest. Great Valley mixed riparian forest is the predominant community type on the banks of Big Chico Creek throughout Lower and Middle Park. Great Valley valley oak riparian forest occupies the highest portions of the floodplain terrace of Big Chico Creek throughout Lower and Middle Park. White alder riparian forest occurs as narrow corridors along the steep-sided, bedrock-constrained upper reaches of Big Chico Creek where stream velocity is highest. These riparian forest communities are considered sensitive natural communities by DFG and are tracked in the CNDDB.

Oak Woodland

Based on habitat mapping conducted in support of the preparation of the BPMMP, the Park contains approximately 1,171 acres of blue oak woodland and savanna, 7 acres of canyon live oak forest, 368 acres of foothill pine–oak woodland, 109 acres of interior live oak woodland, and 403 acres of mixed oak woodland. Oak woodland communities occur throughout Middle and Upper Park and valley oak riparian forest is the predominant community type in Lower Park.

Blue oak woodland, the most common community type in Upper Park, is typically considered a sensitive habitat by DFG and local agencies, although it is not currently tracked in the CNDDB. There is a great deal of concern about oak and other hardwood communities in California (Harris and Kocher 2002) because of the rapid rate of urban development in the foothills where these communities are predominantly found. It is estimated that more than a million acres of California's oak woodlands were lost between 1950 and 1988 (Bolsinger 1988), and loss of oak woodlands has continued at an alarming rate since that time. Objective O. Lower-3 for Lower Park in BPMMP makes the preservation of oak woodland habitat in Lower Park a high priority. Plant Implementation Strategies and Guidelines include establishing success criteria for oak planting programs and implementing the vegetation management guidelines from the Natural Resources Management Plan.

Oak woodland communities, including blue oak woodland and savanna, interior live oak woodland, foothill pine-oak woodland, and mixed oak woodland, occupy more than half of the Disc Golf/Trailhead Area Concept Plan site. A habitat map showing the distribution of oak woodland and other vegetation types is included in Exhibit 3 of Appendix E3. Some of the individual oak trees at the Disc Golf/Trailhead Area Concept Plan site have suffered from unmitigated use of the site as a disc golf course. An assessment of oak health at the SR 32 site was conducted by an independent arborist in conjunction with development of the BPMMP and Disc Golf/Trailhead Area Concept Plan. The technical report detailing the methods and findings used in the assessment is contained in Appendix E4.

Blue oak woodland/savanna exists on the north side of the Horseshoe Lake area. New trails proposed in the Trails Plan, while limited, may be constructed in oak woodland communities. Oak woodland does not exist at Cedar Grove.

Wildflower Fields

Wildflower fields within Bidwell Park are found primarily on thin rocky soils where overall vegetative cover tends to be low and extensive areas of exposed rock and bare soil exist. This community type appears very unique from the surrounding annual grassland community and includes only occasional annual grasses and weedy forbs that characterize adjacent annual grassland communities. Wildflower fields are found in soils of the Tuscan Formation and other thin volcanic soils throughout Middle and Upper Parks, including areas traversed by

proposed new trails, and particularly around Horseshoe Lake and along the south rim. No wildflower fields are located at Cedar Grove. With the exception of the Disc Golf/Trailhead Area Concept Plan site, occurrences of the wildflower field community have not been precisely mapped in the Park, and the total acreage of this community within the Park is unknown. Wildflower fields are widely distributed throughout the Disc Golf/Trailhead Area Concept Plan site; this community was mapped at the site during focused botanical surveys conducted in 2005 (Exhibit 3 in Appendix E3).

Wildflower fields are considered sensitive natural communities by DFG and are tracked in the CNDDB. In addition, this community provides suitable habitat for Bidwell's knotweed, a CNPS List 4 species, and is identified as high priority for protection under Natural Communities Implementation Strategy I. NC-1 of the BPMMP.

Northern Volcanic Mudflow Vernal Pools

Based on habitat mapping conducted in support of the preparation of the BPMMP, the Park contains approximately 95.24 acres of habitat for northern volcanic mudflow vernal pools. Northern volcanic mudflow vernal pools are concentrated primarily on the north side of Upper Park Road beginning at the entrance to Middle Park and extending east to Horseshoe Lake. Additional scattered pools are located at the Disc Golf/Trailhead area. No vernal pools are located in the Cedar Grove area. Northern volcanic mudflow vernal pools are considered sensitive natural communities by DFG and are tracked in the CNDDB. In addition, vernal pools typically qualify as jurisdictional waters of the United States subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the CWA or waters of the state subject to Central Valley Regional Water Quality Control Board (RWQCB) jurisdiction under the state's Porter-Cologne Act. Vernal pool habitat is identified as high priority for protection under Natural Communities Implementation Strategy I. NC-1 of the BPMMP.

Jurisdictional Wetlands

Wetland habitats in the Park that may be subject to USACE jurisdiction under Section 404 of the CWA include vernal pools, freshwater seep/wet meadow, and seasonal wetland. In addition, Big Chico Creek and its tributaries, including the six ephemeral drainages mapped on the south slope of Upper Park, are jurisdictional waters of the United States based on connectivity to the Sacramento River, a navigable water of the United States. Horseshoe Lake may also qualify as waters of the United States, unless it is determined to be hydrologically isolated from other waters. Jurisdictional wetlands are not known to exist at Cedar Grove. Additional wetlands such as seeps and additional small drainages that are not evident on the aerial photographs, or that are too small to have been identified in the reconnaissance-level vegetation mapping effort completed for the Existing Conditions section of the BPMMP, may also be located in the Park. No formal wetland delineation has been completed for the entire Park; therefore, while the extent and likely location of wetland resources are generally understood for purposes of

impact analysis, the precise acreage and boundaries of wetland habitat that may be subject to USACE jurisdiction are not yet known.

Wildlife Movement, Migration Corridors, and Nursery Sites

Bidwell Park is located within a transitional area between montane and valley biotic zones. The Big Chico Creek watershed, and particularly the riparian corridor along Big Chico Creek, functions as a linkage or wildlife movement corridor between higher and lower elevation habitats.

Ecological corridors have been addressed in several conservation biology and landscape planning applications. As landscapes become increasingly fragmented, organisms that occupy remaining patches of suitable habitat may experience a reduction in habitat quality and area, and become at risk to processes that affect small or isolated populations (see Soule 1987, Hanski and Gilpin 1997). These processes may include changes in microclimates, limits to daily or seasonal movements, inbreeding depression, and random demographic or environmental catastrophes. These factors can result in increased mortality or local extinction of populations.

Protecting and managing ecological corridors that link core areas of habitat, and facilitate movement or dispersal among habitat patches, has been widely proposed to reduce the adverse effects of habitat fragmentation. By maintaining or increasing connectivity among habitat patches or distinct regions, corridors may play an important role in maintaining population persistence (Petit et al. 1995) and genetic diversity (Hobbs 1992), facilitating recolonization of sites where populations have gone extinct (Wiens 1996), or allowing for traditional seasonal movements within a population's overall range.

Although corridors are widely proposed, few empirical studies conclude that corridors fulfill their function as movement conduits between core areas (see Simberloff and Cox 1987, Rosenberg et al. 1997). However, several studies have demonstrated their effectiveness in particular applications (e.g., Beier 1995, Haddad 1999). Whether such corridors are an effective conservation measure would depend partly on the spatial design of the corridors, the species and landscapes for which they are planned, and the management goals directing their implementation.

Traditional migration corridors for the Eastern Tehama Deer Herd within the Big Chico Creek watershed have been documented; and the watershed is recognized as a critical migration corridor for the herd (BCCWA 1997). This herd and its use of Bidwell Park for migration and winter habitat are described in the following section. Because of its large size and its composition of large, well-connected, and high-quality habitats across biophysical gradients, Bidwell Park also has a high potential value in facilitating local and regional movement by other wildlife.

Eastern Tehama Deer Herd

Bidwell Park is located within the range of the Eastern Tehama Deer Herd. This herd's range includes eastern Tehama, southeastern Shasta, southwestern Lassen, northwestern Plumas, and northern Butte Counties. The Eastern Tehama Deer Herd is composed primarily of a subspecies of mule deer, the Columbian black-tailed deer (*Odocoileus hemionus columbianus*) (Ramsey 1981). It is the largest migratory herd in California, and its range is considered to be the most extensive in the state (Longhurst et al. 1952).

The Eastern Tehama Deer Herd is an important hunting resource and produces some of the largest mule deer in California (Ramsey 1981). Hunting zones within the range of this herd have traditionally been highly pursued by hunters (California Department of Fish and Game 1998). This herd is of particular economic value to the communities in or near its range (Ramsey 1981). However, the deer population in the Northeast California Deer Assessment Unit (DAU 2), which includes the Eastern Tehama Deer Herd, has declined dramatically in recent years. The population size in DAU 2 declined from approximately 90,000 deer in 1992 to 25,000 deer in 1996. This population decline has resulted in decreased hunter opportunity over this period (California Department of Fish and Game 1998). Causes of this decline are not fully understood, but likely result from habitat changes as brush stands and more open forest stands have been replaced by denser forest. These changes have occurred as a result of long-term fire suppression, conversion of brushfields to timber stands, and reduction in clearcut logging.

DFG defined three broad vegetation types that predominate over the herd's range: grass, woodland grass, and ponderosa pine (Ramsey 1981). The winter range consists primarily of the grass type (which includes substantial areas of chaparral and oak woodland); the summer and transitional ranges are dominated by the ponderosa pine type (which includes a variety of conifer forest habitats). Migration routes between the summer and winter ranges are the longest such routes in California (Ramsey 1981). Distances between the summer and winter ranges are as long as 100 miles in northwestern Lassen County, and movements exceeding 50 miles are common near Chester, Plumas County (Ramsey 1981). Migration corridors often follow ridgelines between major west-slope Sierra-Cascade drainages. Migration from the summer range to the winter range begins in early September, and most of the herd is on the winter range by mid-October. Spring migration begins around early April. Spring migration is casual, and the timing of deer movements coincides with the availability of forage at succeeding elevations. Most of the herd is on the summer range by early June.

Between October and March, the Big Chico Creek watershed and Bidwell Park provide critically important migration and wintering habitat for the Eastern Tehama Deer Herd (BCCWA 1997). Migration corridors within the watershed have been documented, and their importance to successful deer migration and survival cannot be overemphasized (BCCWA 1997).

E4.3.3.2 SIGNIFICANCE CRITERIA

An impact on biological resources resulting from implementation of a proposed project would be considered significant if it would:

- Have a substantial adverse effect (either directly or through habitat modifications) on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by DFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Result in the fragmentation of an existing wildlife habitat, such as blue oak woodland or riparian, and an increase in the amount of edge with adjacent habitats; or
- Conflict with any local policies or ordinances protecting biological resources.

E4.3.3.3 METHODOLOGY

Potential impacts on biological resources resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementing strategies and guidelines pertaining to biological resources and determining whether implementation of these goals, objectives, and implementation strategies and guidelines would result in potentially significant or significant effects on biological resources.

For the four Park Improvement Projects, the conceptual project plans were projected onto or overlaid with maps of existing biological resources. Whenever possible, potentially affected areas were quantified. Impacts analyzed include both direct impacts resulting from project implementation and indirect impacts that could result from altered use patterns of a certain area once the project is implemented. The impact analysis for biological resources identifies both adverse and beneficial impacts.

Focused special-status plant surveys and habitat mapping were conducted for the Disc Golf/Trailhead Area Concept Plan site in support of resource-sensitive design. The technical report describing the methods and results of the surveys and mapping effort is included in Appendix E3. The tree inventory is included in Appendix E4.

The Disc Golf/Trailhead Concept Plan, and the design criteria developed to avoid and minimize sensitive resources, is found in Appendix H to the BPMMP.

E4.3.3.4 IMPACT DISCUSSION

IMPACT BIO-1: ADVERSE EFFECTS ON SPECIAL-STATUS PLANT SPECIES

Effects of the BPMMP

Impact BIO-1a: Adverse Effects of the BPMMP on Special-Status Plants

Implementation of the BPMMP would result in the avoidance or minimization of disturbance or losses of special-status plants. The BPMMP includes goals and guidelines aimed at the protection of natural resources, including special-status plant species. Compliance with the goals, objectives, and implementation strategies and guidelines in the BPMMP would ensure that implementation of the BPMMP would not result in substantial adverse effects on any plant species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS. Implementation of the BPMMP would ensure the Natural Communities Objectives (O. NC-1 through O. NC-8) are met, such as preserving natural habitats and improving conditions for native plant communities. Strategies for meeting these objectives would be to protect sensitive habitats (e.g., vernal pools, wet meadows) by implementing the vegetation management guidelines from Section 3 of the NRMP and by implementing temporary or seasonal restrictions to specific Park areas, when necessary. Implementation of the BPMMP would also ensure that visitor use, development of new facilities and facility expansions, maintenance, restoration, and other ground-disturbing activities would be conducted in accordance with the Plants Objectives (O. P-2 through O. P-5 and O. P-7) and Implementation Strategies and Guidelines (I. P-1, I. P-3, I. P-4, I. P-7, I. P-8, I. P-10, and I. P-11). These objectives aim to preserve, maintain, and protect sensitive plants and natural wetlands by informing the public and prohibiting and/or restricting incompatible recreation activities. These objectives also aim to collect data on the condition of the vegetation communities. Implementation strategies include:

- Native plant planting programs with success criteria,
- Implementing the vegetation management guidelines from Section 3 of the NRMP,
- Modifying existing recreation facilities and restricting and/or controlling recreation activities,
- Cataloging natural wetlands in the Park when funding or volunteer efforts are available, and
- Removing old roads in sensitive areas and avoiding the creation of new roads in sensitive areas.

These objectives and implementation strategies provide a framework for avoiding and minimizing sensitive resources during implementation of the BPMMP. Specific projects implemented in the future as part of BPMMP implementation may require additional environmental review in the form of special-status plant surveys and

impact avoidance and minimization measures to ensure that special-status plants species are not adversely affected when projects are implemented.

With the implementation of the BPMMP's protective objectives and implementation goals and strategies for special-status plants, direct and indirect impacts on special-status plant species resulting from BPMMP implementation would be less than significant. No mitigation is required.

Applies to: BPMMP

Effects of the Four Park Improvement Projects

Impact BIO-1b: Adverse Effects of the Disc Golf/Trailhead Area Concept Plan on Butte County Checkerbloom

The knowledge of the current distribution of Butte County checkerbloom within the Disc Golf/Trailhead Area Concept Plan area has been used in the design of the concept plan layouts, and the layouts have been developed to avoid known Butte County checkerbloom to the greatest extent feasible; therefore, the potential disturbance of known Butte County checkerbloom occurrences at that site would be avoided or minimized with implementation of the various course layouts found in the concept plan. However, a certain amount of direct or indirect impacts on Butte County checkerbloom could occur as a result of inadvertent trampling or picking of plants, or habitat degradation over time.

Three potential layouts have been identified for the Disc Golf/Trailhead area. Concept Plan A, the plan with the largest footprint, has the greatest potential to result in indirect impacts on Butte County checkerbloom, because it would result in the construction of two courses at the SR 32 site, an 18-hole beginner course (the short course) and a 21-hole advanced course (the long course). Concept Plan A also has the greatest potential to result in direct impacts on Butte County checkerbloom, because it would establish four holes (Hole 12 of the short course and Holes 3, 4, and 17 of the long course) in the immediate vicinity of known locations of this plant species. Concept Plan B would also result in construction of two courses, a short course and a long course, but the short course would be reduced to 12 Holes and eliminate Hole 12 on Concept Plan A, which is located immediately adjacent to known Butte County checkerbloom. Concept Plan C has the lowest potential to affect Butte County checkerbloom, because it would eliminate the short course and would result in construction of only the 21-hole long course, using the same design concept as Concept Plans A and B for the long course. All three layouts also include multiuse trails in the immediate vicinity of known locations of Butte County checkerbloom. These trails would be used by a variety of Park users including hikers, mountain bikers, disc golfers, and people visiting the site for scenic viewing or nature study. The potential layouts route these trails to avoid direct impacts to Butte County checkerbloom. However, in some cases, individual of Butte County checkerbloom may occur on both sides of a proposed trail.

All three course layouts could result in a minor degree of direct and/or indirect impacts on Butte County checkerbloom, because they all would establish holes in the immediate vicinity of known locations of this species and all include proposed trails in the immediate vicinity of known locations of this species.

It is important to note that implementation of the Disc Golf/Trailhead Area Concept Plan would reduce direct and indirect impacts on Butte County checkerbloom compared to the current, unmitigated use of the area as a disc golf course, because tees, holes, and trails would be well-defined and located in the less environmentally sensitive locations. The proposed layouts would direct disc golf use to the most appropriate locations, rather than allowing for continued, undirected walk-over of the general area. Course improvements have been designed to restrict foot traffic to clearly defined trails and establish clearly defined tees, targets, and fairways. Resource protection areas would also be defined and set aside from disc golf use. This design approach would reduce the overall footprint of each hole and eliminate errant and volunteer trails, fairways, tees, and targets. Also, Holes 3 and 4 of the long course would have alternate pin locations, depending on the season, to lessen the potential for disturbance to Butte County checkerbloom during the active growth season (March to July). Therefore, compared to existing conditions, any of the three layouts identified in the Disc Golf/Trailhead Area Concept Plan would result in less adverse impact on Butte County checkerbloom. Nonetheless, recognizing the sensitivity of the Butte County checkerbloom and the remaining potential for loss or disturbance of the species from implementation of the concept plan, a potentially significant adverse effect could occur.

Loss or degradation of populations of Butte County checkerbloom resulting from implementation of the Disc Golf/Trailhead Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-1b: Implement Measures to Protect Butte County Checkerbloom in the Disc Golf/Trailhead Concept Plan Area

The following measures shall be implemented to mitigate potential direct and indirect effects on populations of Butte County checkerbloom from implementation of the Disc Golf/Trailhead Area Concept Plan:

- As provided in Appendix H of the BPMMP, the Disc Golf/Trailhead Area Concept Plan shall be implemented to avoid direct and indirect impacts on locations of Butte County checkerbloom on the site to the greatest extent feasible. All disc golf structures (e.g., tees, targets, fairways) and trails shall be placed a minimum of 50 feet from locations that currently support Butte County checkerbloom wherever possible. Where this cannot be accomplished due to physical site constraints, the buffer may be reduced, but shall remain at a minimum of 25 feet.

- Before construction of any facility at the Disc Golf/Trailhead area in the vicinity of known locations of Butte County checkerbloom, exclusionary fencing shall be installed along a 25-foot buffer around the outer perimeter of the occurrence. Exclusionary fencing shall be installed under the guidance of a qualified botanist before commencement of construction to keep workers and equipment from disturbing existing Butte County checkerbloom plants. The fencing shall be kept in place and periodically inspected and repaired, if necessary, for the duration of construction.

- The Disc Golf/Trailhead Area Concept Plan shall restrict foot traffic to clearly defined trails and disc golf features. Trails shall be constructed as narrow as possible to avoid degradation of suitable habitat for Butte County checkerbloom (and other special status plant species). Where existing disc golf structures and trails in the vicinity of existing locations of Butte County checkerbloom will be decommissioned, barriers (such as boulders) shall be placed to discourage use of these trails and structures.

- Permanent signage at the trailhead/rest area shall be installed to inform Park users of the presence and sensitivity of Butte County checkerbloom (and other sensitive resources) on the site.

- As provided in Appendix H of the BPMMP, alternate pin locations for Holes 3 and 4 of the long course shall be used from March 1 through July 1 to minimize potential disturbance of nearby checkerbloom plants during the active growth and blooming period.

- Per Plant Objective O. P-8 of the BPMMP, an adaptive management program shall be implemented that relies on periodic data collection on the distribution and progress of Butte County checkerbloom at the Disc Golf/ Trailhead site. The goal of this adaptive management program shall be to document and monitor changes in the existing population of Butte County checkerbloom over time.

- If data collection indicates a decline in existing populations after implementation of the Disc Golf/Trailhead Area Concept Plan, relocation of trails or disc golf structures in the vicinity of these populations, or other management strategies that would benefit the plants based on the data collected, shall be implemented. This strategy would implement Plant Objective O. P-7 and Plant Implementation Strategies and Guidelines I. P-3 and I. P-4 of the BPMMP.

Applies to: Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before ground-disturbing activities and during ongoing operation

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-1b would reduce potentially significant impacts on Butte County checkerbloom from implementation of the Disc Golf/Trailhead Area Concept Plan to a less than significant level.

Impact BIO-1c: Adverse Effects of the Trails Plan and Horseshoe Lake Area Concept Plan on Butte County Checkerbloom

Documented occurrences of Butte County checkerbloom are also located within the Trails Plan area and within the vicinity of the Horseshoe Lake Area Concept Plan. (Please refer to Impact BIO-1e below for a discussion of as-yet-unknown occurrences of Butte County checkerbloom and other special-status plant occurrences.)

Focused special-status plant surveys have not been conducted for the Horseshoe Lake Area Concept Plan or the current Trails Plan area, so additional populations of Butte County checkerbloom could exist in potential disturbance areas of these site-specific Park Improvement Projects. Some of the proposed trail segments, such as the proposed new trail to Monkey Face Overlook, traverse areas where Butte County checkerbloom previously has been documented.

Direct impacts, such as removal or damage of populations of Butte County checkerbloom, have the potential to result from implementation of the Trails Plan and the Horseshoe Lake Area Concept Plan. Indirect impacts on Butte County checkerbloom may result from degradation of suitable checkerbloom habitat caused by user activity. Potential impacts could also result from future facility improvements and maintenance or restoration activities.

Loss or degradation of populations of Butte County checkerbloom resulting from implementation of the Trails Plan and/or Horseshoe Lake Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan

Mitigation Measure BIO-1c: Implement Measures to Protect Known Occurrences of Butte County Checkerbloom in the Trails Plan and Horseshoe Lake Area Concept Plan Areas

To mitigate the potential direct and indirect effects on known occurrences of Butte County checkerbloom during implementation of the Trails Plan and Horseshoe Lake Area Concept Plan areas, the following measures shall be implemented:

- Before the start of any ground-disturbing activities, the City shall retain a qualified botanist to identify the locations of previously documented occurrences of Butte County checkerbloom in the Trails Plan and Horseshoe Lake Area Concept Plan Areas. The locations shall be clearly flagged or otherwise marked for avoidance during construction.

- The flagged occurrences shall be avoided to the maximum extent feasible and a buffer of at least 25 feet shall be established.

- If impacts to known occurrences of Butte County checkerbloom cannot be avoided while accomplishing the Park Improvement Project goals, every effort shall be made to minimize impacts to these occurrences.

- If it is determined that known occurrences of Butte County checkerbloom cannot be avoided, appropriate mitigation shall be developed through consultation with DFG. Any loss of Butte County checkerbloom shall be mitigated through preservation and enhancement of remaining occurrences and preservation and enhancement of suitable habitat on-site. Mitigation shall aim to ensure a no-net loss in special-status plant populations/and or habitat within the Park or region.

- Any mitigation developed through consultation with DFG shall be implemented as part of project implementation, and any monitoring and remedial action requirements specified as part of the consultation shall be implemented by the City.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan

Timing/Implementation: Before ground-disturbing activities and during ongoing operation

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-1c would reduce potentially significant impacts on known occurrences of Butte County checkerbloom from implementation of Trails Plan and Horseshoe Lake Area Concept Plan to a less than significant level.

Impact BIO-1d: Adverse Effects of Disc Golf/Trailhead Area Concept Plan on Bidwell's Knotweed

The Disc Golf/Trailhead Area Plan was designed to minimize impacts to Bidwell's knotweed to the greatest extent possible. However, direct impacts such as removal or damage of Bidwell's knotweed may still occur as a result of implementation of the Disc Golf/Trailhead Area Concept Plan, as the plant is widely distributed throughout the Disc Golf/Trailhead area project site. In addition, indirect impacts on Bidwell's knotweed may result from the degradation of habitat in which this species occurs. Potential impacts such as soils compaction or trampling in the immediate vicinity of known locations of this species could also result from future facility improvements, maintenance or restoration activities, and visitor use. It is anticipated that wildflower field communities, and eventually Bidwell's knotweed, will establish on suitable soils in the decommissioned parts of the existing disc golf course footprint once recreational activities are eliminated from these areas.

The designation as a CNPS List 4 species (plants of limited distribution—a watch list) does not afford Bidwell's knotweed any legal protection under the federal or California Endangered Species Act or CEQA, but the plant is recognized by local resource specialists and agency personnel as a unique and valuable resource worthy of protection and stewardship. Plant Implementation Strategies and Guidelines I. P-3, I. P-4, and I. P-7 of the BPMMP aim to minimize potential effects on special-status plants, including Bidwell's knotweed. These implementation strategies state that where possible, existing facilities shall be modified to minimize potential effects on special-status plants, and that intensive recreation shall be restricted and nonintensive recreation shall be controlled where necessary to minimize potential effects on special-status plants, and that building of new roads and trails through natural wetlands and shallow soils should be avoided, where feasible, especially where special-status plant populations may occur. Even with these implementation strategies, some loss or degradation to Bidwell's knotweed at the Disc Golf/Trailhead area may occur. Loss or degradation of Bidwell's knotweed populations resulting from implementation of the Disc Golf/Trailhead Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-1d: Implement Measures to Protect Bidwell's Knotweed at the Disc Golf/Trailhead Area

The following measures shall be implemented to mitigate for potential direct and indirect effect to Bidwell's knotweed at the Disc Golf/Trailhead Plan area:

- The Disc Golf/Trailhead Area Concept Plan shall be implemented to minimize direct and indirect impacts on Bidwell's knotweed habitat on the site. Because Bidwell's knotweed is an annual plant species, population sizes may fluctuate greatly from year to year. Therefore, simply avoiding plants that are present in a given year would not ensure that great numbers of individuals would not be affected in subsequent years. Therefore, a habitat approach shall be taken to minimize impacts on this species. This approach would entail minimizing impacts to wildflower fields, the native plant community that supports Bidwell's knotweed.

- Consistent with the Disc Golf/Trailhead Area Concept Plan, trails shall generally be placed outside of wildflower fields. The Disc Golf/Trailhead Area Concept Plan shall be implemented to restrict foot traffic to clearly defined trails and disc golf structures. The number of trails dissecting wildflower fields shall be minimized to the fewest number necessary to facilitate reasonable access to the disc golf course and scenic viewpoints, and trails shall be as narrow as possible and have clearly marked edges to reduce widening and discourage users from wandering off the path. Existing trails through wildflower fields that will not be retained as part of the Disc Golf/Trailhead Area Concept Plan shall be decommissioned, and barriers (such as

boulders) shall be placed just outside any points where trails enter the wildflower field community to discourage use of these trails.

- Exclusionary fencing shall be installed under the guidance of a qualified botanist before commencement of construction to keep workers and equipment from disturbing wildflower field habitat intended for preservation. High priority shall be given to preserving those wildflower field communities that contained Bidwell's knotweed during surveys conducted in 2005.

- Permanent signage at the trailhead/rest area shall be installed to inform Park users of the presence and sensitivity of Bidwell's knotweed and wildflower field habitat and to deter users from disturbing the species.

- Per Plant Objective O. P-8 of the BPMMP, an adaptive management program shall be implemented that relies on periodic data collection on the distribution and progress of Butte County checkerbloom at the Disc Golf/ Trailhead site. The goal of this adaptive management program shall be to document and monitor changes in the existing population of Butte County checkerbloom over time.

- If data collection indicates a decline in existing populations after implementation of the Disc Golf/Trailhead Area Concept Plan, relocation of trails or disc golf structures in the vicinity of these populations, or other management strategies that would benefit the plants based on the data collected, shall be implemented. This strategy would implement Plant Objective O. P-7 and Plant Implementation Strategies and Guidelines I. P-3 and I. P-4 of the BPMMP.

Applies to: Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: During construction of Disc Golf/Trailhead Area Plans and during ongoing operation

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-1d would reduce potentially significant impacts on Bidwell's knotweed from implementation of the Disc Golf/Trailhead Area Concept Plan to a less than significant level.

Impact BIO-1e: Adverse Effects of Park Improvement Projects on Unknown Occurrences of Butte County Checkerbloom, Bidwell's Knotweed, and Other Special-status Plant Species

As mentioned above, Bidwell's knotweed is known to occur within the Horseshoe Lake Area and could be present in several of the areas proposed for trail improvement in the Trails Plan and could potentially be impacted by construction activities in these areas. Potentially suitable habitat for fox sedge, a CNPS List 2 species, is present in the riparian community immediately north of the Cedar Grove Area Concept Plan site. If present, this

species could be affected by the proposed construction and expansion of the parking area in this vicinity. Potentially suitable habitat for many of the 39 special-status plant species described in Table 2.3.2-2 in the BPMMP is present in the Trails Plan and Horseshoe Lake Area Concept plan areas. In addition to Butte County checkerbloom and Bidwell's knotweed, small spikerush (CNPS List 4) has been documented at Horseshoe Lake, and shield-bracted monkeyflower (CNPS List 4) has been documented northwest of Horseshoe Lake in an area that could be affected by development of a new trail to Monkey Face Overlook. The Horseshoe Lake Area Concept Plan and Trails Plan could, therefore, result in direct and indirect impacts on these species. Humboldt lily (CNPS List 4) has been documented in the vicinity of Parking Lots S and T. Expansion of these lots and new trails to these lots is under consideration as part of the Trails Plan. Expansion of the parking lots and construction of trails in this area could result in direct impacts on Humboldt lily. Because focused special-status plant surveys have not been conducted in these site-specific project areas, it is possible that additional special-status plants are present in these areas and could be lost as a result of construction activity and Park use.

Direct impacts, such as removal or damage of special-status plants, may occur as a result of implementation of the Trails Plan, the Horseshoe Lake Area Concept Plan and the Cedar Grove Plan. Indirect impacts on special-status plants may result from these Park Improvement Projects because of degradation of their habitat. Potential indirect impacts such as soil compaction or inadvertent trampling or picking of specimens could also result from future facility improvements, maintenance or restoration activities, and visitor use.

The designation as a CNPS List 4 species (plants of limited distribution—a watch list) does not afford some of the plants discussed above any legal protection under the federal or California Endangered Species Acts, but these plants are recognized by local resource specialists and agency personnel as unique and valuable resources worthy of protection and stewardship and potential impacts to these species will be considered during project planning and implementation.

Loss or degradation of other special-status plant populations protected by law as a result of development of the Trails Plan, Horseshoe Lake Area Concept Plan, and/or Cedar Grove Area Concept Plan is a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan

Mitigation Measure BIO-1e: Implement Measures to Protect Unknown Occurrences of Butte County Checkerbloom, Bidwell's Knotweed, and Other Special-status Plant Species

The following measures shall be applied to mitigate potential direct and indirect impacts on as-yet-unknown occurrences of Butte County checkerbloom, Bidwell's knotweed, and other special-status plant species as a result of implementation of the Cedar Grove Area Concept Plan, Trails Plan, and Horseshoe Lake Area Concept Plan:

- Before the start of any ground-disturbing activities, the City shall retain a qualified botanist to conduct protocol-level special-status plant surveys in areas that have the potential to be disturbed by implementation of the Cedar Grove Concept Plan, Trails Plan, and Horseshoe Lake Concept Plan. These surveys shall be conducted during the appropriate time of year when the potentially occurring species would be present and clearly identifiable (i.e., the blooming period as identified in Table 2.3.2-2 in the BPMMP) and shall focus on those areas supporting suitable habitat for the target species. Survey protocols outlined by DFG shall be followed. CNPS List 4 species with potential to occur in the project sites shall be included in the surveys whenever feasible, so data on their distribution can be taken into consideration during project planning and design.

- For the Trails Plan, special-status plant surveys may be conducted on a segment by segment basis, as specific trail segments are proposed for development.

- If no special-status plant occurrences are found in the areas that would be affected by the site-specific projects, then the results of the surveys shall be documented in a letter report to the City and no further mitigation shall be required.

- If any special-status plant species are identified in the site-specific project areas, the location and extent of each occurrence shall be inventoried and these occurrences shall be avoided, to the maximum extent feasible, while still accomplishing the goals of the four Park Improvement Projects.

- If impacts on special-status plants cannot be avoided while accomplishing the Park Improvement Project goals, every effort shall be made to minimize impacts on special-status plants (including CNPS List 4 plants) through design planning.

- If federally or state listed plant species are identified in the site-specific project areas and it is determined that occurrences of these species would be directly or indirectly affected by the site-specific projects, then appropriate mitigation shall be developed through consultation with USFWS or DFG, depending on the listing status of the plant. Any loss of special-status plants (except CNPS List 4 plants) shall be mitigated through preservation and enhancement of remaining occurrences and preservation and enhancement of suitable habitat on-site. Mitigation shall aim to ensure a no-net loss in special-status plant populations/and or habitat within the Park or region. Impacts to CNPS list 4 plants shall be avoided to the greatest extent possible. If complete avoidance it not feasible, impacts to CNPS plants shall be minimized.

- Any mitigation developed through consultation with the regulatory agencies shall be implemented as part of project implementation, and any monitoring and remedial action requirements specified as part of the consultation shall be implemented by the City.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan

Timing/Implementation: Prior to any ground-disturbing activities

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-1e would reduce potentially significant impacts on unknown occurrences of Butte County checkerbloom, Bidwell's knotweed, and other special-status plant species from implementation of Park Improvement Projects to a less than significant level.

IMPACT BIO-2: ADVERSE EFFECTS ON SPECIAL-STATUS WILDLIFE SPECIES

Effects of the BPMMP

Impact BIO-2a: Adverse Effects of the BPMMP on Special-status Wildlife

The BPMMP includes goals and guidelines aimed at the protection of natural resources, including special-status terrestrial wildlife and fish species, in the Park. The BPMMP includes objectives (O. TW-1 through O. TW-5) that aim at protecting special-status terrestrial wildlife by providing opportunities for nesting, foraging, hunting and other essential wildlife activities, maintain habitat connectivity, minimize disturbance, and manage or abate non-native, invasive animal species. The BPMMP also includes terrestrial wildlife implementation strategies and guidelines (I. TW-1 through I. TW-6) for Park management that would result in the avoidance or minimization of disturbance or losses of special-status terrestrial wildlife species and their habitat, such as preserving the wildlife corridor along Big Chico Creek, partnering with groups and organizations (e.g., students and faculty at CSUC) to collect wildlife population data, and restricting outdoor lighting in or near natural areas. The Natural Communities Objectives (O. NC-1 through O. NC-8) also include objectives for preserving natural habitats and improving conditions for native plant communities which provide important habitat for common and special-status wildlife species. Implementation Strategies for meeting these objectives would be to protect sensitive habitats (e.g., vernal pools, wet meadows) by implementing the vegetation management guidelines from Section 3 of the NRMP and by implementing temporary or seasonal restrictions to specific Park areas, when necessary. The BPMMP contains several objectives and implementation strategies and guidelines aimed at protecting and enhancing aquatic habitat and associated resources, including special-status fish within the Park. The Aquatic Resources Objectives (O. AR-1 through O. AR-6) include objectives for protecting and enhancing fisheries and fishery habitat. Aquatic Resources Implementation Strategies I. AR-1 though I. AR-9 include strategies such as working to eliminate migration barriers, assessing and protecting water quality, facilitating riparian restoration projects, restoring spawning gravel, providing bathroom and trash receptacles to reduce potential bacteriological contamination and outreach and education. Compliance with BPMMP objectives and implementation strategies and guidelines would ensure that the overall BPMMP would not result in substantial adverse effects on any fish species identified as a

candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS.

Compliance with BPMMP objectives and implementation strategies and guidelines would ensure that the overall BPMMP would not result in substantial adverse effects on any terrestrial wildlife or fish species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS. With the implementation of the BPMMP's protective objectives and implementation goals and strategies for special-status terrestrial wildlife and fish species, direct and indirect impacts on special-status terrestrial wildlife and fish species resulting from BPMMP implementation other than as analyzed below in regard to the four Park Improvement Projects, would be less than significant. No mitigation is required.

Applies to: BPMMP

Effects of Park Improvement Projects

Impact BIO-2b: Adverse Effects of Park Improvement Projects on Valley Elderberry Longhorn Beetle (VELB)

Valley elderberry longhorn beetle (VELB) exit holes on elderberry shrub have been documented at several locations within the Park, including locations in Middle Park along Big Chico Creek in the vicinity of Horseshoe Lake (CNDDB 2005). However, no Parkwide inventory of elderberry shrubs that provide suitable habitat for VELB has been conducted, so elderberry shrubs may be found elsewhere in the Park. VELB inhabit elderberry shrubs with branches that are one inch in diameter or more and rely on these shrubs for their survival. Direct impacts, such as removal or damage of shrubs occupied by VELB, may occur as a result of implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Cedar Grove Area Concept Plan. Implementation of these projects could also result in indirect impacts on VELB, including future mortality or site abandonment as a result of habitat degradation. During construction, elderberry shrubs could be subjected to dust deposition. If VELB are present, the dust settling on leaves could cause disorientation and ill health effects, potentially resulting in a failure to reproduce. Dust could also cause a significant decrease in the level of photosynthesis in the elderberry shrub and result in a decline in the health of the shrub, further affecting VELB.

Direct or indirect effects on VELB resulting from implementation of the Trails Plan, Horseshoe Lake Area Concept Plan and Cedar Grove Area Concept Plan would be a potentially significant effect requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, and Cedar Grove Area Concept Plan

Mitigation Measure BIO-2b: Implement Measures to Protect Elderberry Shrubs, the Host Plant for the Valley Elderberry Longhorn Beetle

The City shall ensure that the following measures are implemented to minimize potential project effects on elderberry shrubs, the host plant for valley elderberry longhorn beetles.

Areas that support elderberry shrubs shall be identified and, to the extent feasible and practicable, project elements shall be designed to avoid direct effects on these areas. Before beginning any ground-disturbing project activities, a qualified biologist shall identify areas that support elderberry shrubs and that could be affected by the given project. The City shall ensure, through coordination with the biologist, that the footprint of project features and construction zones, staging areas, and access routes are designed to avoid disturbance of potential habitat to the extent feasible and practicable.

If impacts to areas supporting elderberry shrubs cannot be avoided, focused surveys shall be conducted. Before the initiation of any ground-disturbing activities, a qualified biologist shall conduct surveys for elderberry shrubs within 100 feet of the impact area, in accordance with USFWS guidelines. All elderberry shrubs with potential to be affected by project activities shall be mapped and the number of stems greater than 1 inch in diameter on each shrub that may require removal shall be counted. If no elderberry shrubs are found during focused surveys, no further action shall be required.

If potential effects to valley elderberry longhorn beetle cannot be avoided, measures shall be implemented to minimize and mitigate unavoidable effects. Before the initiation of any ground-disturbing project activities within 100 feet of elderberry shrubs that are suitable for use by valley elderberry longhorn beetles, USFWS shall be consulted to develop appropriate measures. Such measures may include those described in Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999) and the VELB Programmatic Consultation (USFWS 1996). Minimization measures may include implementation of buffers around shrubs that would not be removed, transplanting shrubs to a conservation area, conducting worker awareness training, and periodic biological monitoring. Compensation may include planting of elderberry seedling or cuttings and associate native species.

Authorization for take of valley elderberry longhorn beetle under ESA shall be obtained if it is determined that implementation of a program component is likely to result in take, despite implementation of avoidance and minimization measures.

- All measures developed through informal consultation with USFWS shall be implemented, as well as any additional measures adopted through a formal permitting process, if applicable.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, and Cedar Grove Area Concept Plan

Timing/Implementation: Before and during construction activities

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-2b would reduce potentially significant impacts on VELB from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-2c: Adverse Effects of Park Improvement Projects on Vernal Pool Crustacean and Western Spadefoot Habitat

Vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, and western spadefoot have not been documented in the Park, but potential habitat for these species is provided by vernal pools present around Horseshoe Lake. Several shallow vernal pools also occur on the south rim, including a few on the Disc Golf/ Trailhead Area site. Vernal pools in the Park may be considered potentially suitable habitat for special-status vernal pool crustaceans and western spadefoot. Direct impacts, such as removal or degradation of vernal pools, may occur as a result of implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Plan. Potential impacts could also result from future facility improvements, maintenance or restoration activities, and visitor use, such as soils compaction, intrusion of pets, and vegetation trampling within the pools. Indirect impacts could result from degradation in water quality or alteration of the watershed supporting the pools.

Potential loss or disturbance of vernal pool habitat potentially occupied by vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, and western spadefoot would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-2c: Implement Measures to Protect and Compensate for Loss of Vernal Pool Invertebrate and Western Spadefoot Habitat

The City shall ensure that the following measures are implemented to avoid, minimize, and mitigate potential project effects on vernal pool invertebrates and western spadefoot:

- Before any ground-disturbing project activities begin, the City shall retain a qualified biologist to identify and map potential habitat in areas that could be affected by the given project. The City shall ensure, through coordination with the biologist, that the footprint of project features and construction zones, staging areas, and

access routes are designed to avoid direct or indirect effects on suitable habitat for vernal pool invertebrates and western spadefoot to the extent feasible and practicable. In addition to vernal pools, suitable habitat for western spadefoot includes the surrounding grassland matrix.

- If vernal pool invertebrate and western spadefoot habitat cannot be avoided, measures shall be implemented to minimize and mitigate unavoidable effects. Before beginning any ground-disturbing project activities in such habitat, USFWS shall be consulted to identify appropriate measures to minimize and compensate for adverse effects on special-status vernal pool invertebrates; DFG shall be consulted to identify measures to minimize and compensate for adverse effects on western spadefoot. Applicable avoidance and minimization measures may include those described in USFWS's vernal pool crustacean Programmatic Consultation (USFWS 1996a). Minimization measures for vernal pool invertebrates are likely to include, but would not be limited to, fencing of habitat to be avoided, timing of ground disturbance to correspond with the dry season, conducting worker awareness training, and periodic biological monitoring. Compensation may include preservation, enhancement, and/or creation of suitable habitat in areas that currently, or could in the future, support special-status invertebrate and/or spadefoot populations.

- Authorization for take of vernal pool invertebrates under ESA shall be obtained if it is determined that implementation of a program component is likely to result in take, despite implementation of avoidance and minimization measures.

- All measures developed through informal consultation with USFWS and DFG shall be implemented, as well as any additional measures adopted through a formal permitting process, if applicable.

Implementing this mitigation measure would reduce the potential impact on special-status vernal pool invertebrates and western spadefoot to a less than significant level.

Applies to: Trails Plan Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before and during construction in and near vernal pool habitats and Western spadefoot habitats.

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-2c would reduce potentially significant impacts on vernal pool crustacean and western spadefoot habitat from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-2d: Adverse Effects of Park Improvement Projects on Nesting Raptors, and Burrowing Owls

The extent and mix of grassland, woodland, riparian, and cliff habitats found in Bidwell Park provide important winter, breeding, and migration habitat for a high proportion of the raptor species known to occur over the larger region. An active peregrine falcon nest site occurs on the cliff below the southern ridgetop, adjacent to the Disc Golf/Trailhead Area Concept Plan area in Upper Bidwell Park. Large trees in the woodland and riparian habitats in the vicinity of the Cedar Grove, Trails Plan, Horseshoe Lake, and Disc Golf/Trailhead areas provide potential nest sites for special-status raptor species, including Cooper's hawk and white-tailed kite. Some grasslands throughout the Park could provide nesting habitat and winter burrow sites for burrowing owls. In addition, other cliffs and rock outcrops found in the vicinity of the Trails Plan, Horseshoe Lake, and Disc Golf/Trailhead areas provide potential nest sites for other raptors. Raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code. Implementation of the site-specific Park Improvement Projects would not substantially reduce nesting, foraging, or migration opportunities for raptors in the Park because suitable habitat would not be removed in substantial quantities. However, raptor nests or burrows could be affected by the removal of trees and/or nearby construction related to the four Park Improvement Projects, which could result in potentially significant disturbance of nesting raptors during the breeding season (approximately February 1 to August 31, depending on the species).

Potential loss of raptor nests or disturbance of nesting special-status raptors as a result of implementation of the Park Improvement Projects would be a potentially significant impact requiring mitigation. Loss of active nests of common raptor species (e.g., red-tailed hawk [*Buteo jamaicensis*]) would be inconsistent with the MBTA and a violation of Fish and Game Code, but would not constitute a significant impact under CEQA, because CEQA addresses impact special-status species only.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/ Trailhead Area Concept Plan

Measures to Protect Nesting Raptors and Burrowing Owls

The following measures shall be implemented to minimize and mitigate the potential disturbance of nesting raptors and burrowing owls.

Mitigation Measure BIO-2d(1): Protect Tree-Nesting Raptors

Before project construction, it shall be determined whether any construction or tree removal is proposed during the raptor nesting season (February 1 to August 31). If no construction or tree removal will occur during the raptor nesting season, no further mitigation shall be necessary.

If construction or tree removal is proposed during the raptor nesting season, a focused survey for special-status and common raptor nests shall be conducted by a qualified biologist during the nesting season to identify active nests within 500 feet of the project area. The survey shall be conducted no less than 14 days and no more than 30 days before the beginning of construction or tree removal.

If nesting raptors are found during the focused survey, impacts shall be avoided by establishment of appropriate buffers. No project activity shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active. DFG guidelines recommend implementation of 500 foot buffers, but the size of the buffer may be adjusted if a qualified biologist determines it would not be likely to adversely affect the nest. Monitoring of the nest by a qualified biologist may be required if the activity has potential to adversely affect the nest.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/ Trailhead Area Concept Plan

Timing/Implementation: Before and during construction during the breeding season of tree-nesting raptors

Responsible Party: City of Chico

Mitigation Measure BIO-2d(2): Protect Peregrine Falcon

If construction at the Disc Golf/Trailhead Area Concept Plan site is to occur during the peregrine falcon breeding period (generally February 1 to June 30), an appropriate buffer around the southern cliff edge shall be determined by a qualified biologist and construction activities shall be avoided within the buffer zone unless a qualified biologist confirms there is no active nest on the cliff.

If construction commences between June 30 and February 1, no buffer will be necessary.

Applies to: Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before and during construction during the breeding season of peregrine falcons known to nest below the South Rim

Responsible Party: City of Chico

Mitigation Measure BIO-2d(3): Protect Burrowing Owl

Grassland habitat in Middle and Upper Park provides potentially suitable habitat for burrowing owls. The following mitigation measure shall be implemented to identify suitable habitat and protect burrowing owl from adverse effects of the Park Improvement Projects:

- Before any ground disturbance related to the Park Improvement Projects that occur within or adjacent to grassland habitat, a qualified biologist shall conduct a preconstruction survey to assess habitat suitability for burrowing owl (e.g., based on grassland structure and presence of burrows) and, in areas determined to be suitable, evaluate use by burrowing owls in accordance with current DFG survey guidelines (CDFG 1995). Surveys shall be conducted within 30 days prior to beginning construction activities and shall include the disturbance footprint and a 500-foot radius of the disturbance footprint perimeter. For construction activities occurring during the burrowing owl breeding season (February 1–August 31), surveys shall document whether burrowing owls are nesting on or directly adjacent to disturbance areas. Survey results shall be valid only for the season during which the survey is conducted. If no burrowing owls are documented during the surveys, no further mitigation shall be required.

If burrowing owls are found, the following additional measures shall be implemented:

- Project construction shall avoid all burrowing owl nest sites that could otherwise be disturbed by project construction during the breeding season (February 1–August 31) or while the nest is occupied by adults or young. Avoidance shall include establishment of a nondisturbance buffer zone of at least 250 feet around each nest site. The buffer zone shall be delineated by highly visible temporary construction fencing. Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the nest site is no longer used by burrowing owls.

- If burrowing owls are found during the nonbreeding season (September 1–January 31), project construction shall avoid the owls and the burrows they are using. Avoidance shall include the establishment of at least a 160-foot nondisturbance buffer zone around each burrow being used. The buffer shall be delineated by highly visible temporary construction fencing. If burrowing owls cannot be avoided, the City shall conduct passive relocation by installing one-way doors in suitable burrow entrances that are used or may be used by the owls and that would be collapsed or degraded by construction activities. This measure is described below. Artificial burrows shall be created in an area of the Park determined suitable by a qualified biologist in coordination with Fish and Game staff. The burrows shall be created according to the conservation measures established for this species.

- To displace burrowing owls without destroying eggs, young, or adults, one-way doors shall be installed on owl burrows before February 1 prior to disturbance, and each burrow shall be monitored following DFG's protocol (California Department of Fish and Game 1995). This measure includes monitoring the burrow for a 48-hour period after the one-way doors are installed. The doors shall be checked every 24 hours following installation to determine whether they are still intact. If the one-way door is still correctly installed after a continuous 48-hour period (i.e., no animals have dug up the door and rendered it useless), then the one-way

door shall be removed and the burrows shall be excavated using hand tools and plastic tubing to maintain an escape route for any animals still inside the burrow.

Applies to: Trails Plan and Horseshoe Lake Area Concept Plan

Timing/Implementation: Before and during construction

Responsible Party: City of Chico

Implementation of Mitigation Measures BIO-2d(1) through BIO-2d(3) would reduce potentially significant impacts on nesting raptors from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-2e: Adverse Effects of Park Improvement Projects on Northwestern Pond Turtle

Pond turtle habitat could be affected by implementation of the Trails Plan and the Horseshoe Lake Area Concept Plan in a variety of ways. Temporary and permanent loss of suitable habitat could result from improvement activities along ponds, creeks, and streams. Construction activities associated with these program components could also result in direct disturbance and loss of individual pond turtles. Potential impacts to northwestern pond turtle, a species of special concern to DFG, would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan and Horseshoe Lake Area Concept Plan

Mitigation Measure BIO-2e: Protect Northwestern Pond Turtle: Identify Habitat, Minimize Potential Impacts, and Mitigate in Consultation with DFG as Needed

Before any ground-disturbing project activities begin, a qualified biologist shall identify potential aquatic and nesting habitat in areas that could be affected by the given Park Improvement Project. The City shall ensure, through coordination with the biologist, that the footprint of project features and construction zones, staging areas, and access routes are designed to avoid direct or indirect effects on suitable habitat for northwestern pond turtle to the extent feasible and practicable.

If effects to pond turtle habitat cannot be avoided, measures shall be implemented to minimize unavoidable effects. Before beginning any project activities in such habitat, DFG shall be consulted to identify appropriate measures to minimize adverse effects on pond turtles. Such measures are likely to include, but would not be limited to, relocating turtles to appropriate areas, installing fencing to exclude turtles from nesting in areas where ground disturbance would occur, conducting worker awareness training, and periodic biological monitoring. All measures deemed appropriate and feasible during this consultation with DFG shall be implemented.

Applies to: Trails Plan and Horseshoe Lake Area Concept Plan

Timing/Implementation: Before and during construction

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-2e would reduce potentially significant impacts on northwestern pond turtle from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-2f: Adverse Effects of Park Improvement Projects on Other Special-Status Wildlife

Special-status bird species that are known to use the riparian woodland and scrub habitat within Bidwell Park are yellow warbler and yellow-breasted chat, both DFG species of special concern. Some areas of riparian habitat along Big Chico Creek appear to provide biophysical habitat elements that are suitable for the state-listed yellow-billed cuckoo, however, this species has not been documented there despite frequent visits by an active birdwatching community. Loggerhead shrike, a DFG species of special concern, occurs in the Park and likely breeds there. In 2006, black rails were observed in Upper Bidwell Park, near Bear Hole. Yellow warbler, yellow-breasted chat, and loggerhead shrike could be affected during construction of the four Park Improvement Projects directly through loss of habitat and increased localized habitat fragmentation. Substantial habitat loss and fragmentation would result in the reduction of population sizes and diminished use of the project area by some local wildlife populations, including these special-status species. However, implementation of the four Park Improvement Projects would not substantially reduce nesting, foraging, or migration opportunities for these species in the Park because suitable habitat would not be removed in substantial quantities. Therefore, the amount of suitable habitat removed is not expected to affect the distribution, reproductive success, or population viability of these species. Black rails in Upper Park occur in association with marsh habitat. Because this habitat type will be avoided during implementation of the Trails Plan (the only Park Improvement Project that may involve activities near black rail habitat), implementation of the Park Improvement Projects is not expected to result in adverse effects on black rails.

Removal and/or disturbance of active nests of yellow warbler, yellow-breasted chat, and loggerhead shrike, as well as common nesting birds that are protected under the MBTA and the Fish and Game Code, could also result from implementation of Park Improvement Projects. Disturbance of nesting pairs could result in nest abandonment and loss of active nests. Loss of active nests of these special-status birds could result in a substantial adverse effect to local populations of the affected species. Loss of active nests of common species would be inconsistent with the MBTA and a violation of Fish and Game Code but would not constitute a significant impact under CEQA, as CEQA addresses impacts to special-status species only. Impacts to special-status nesting birds would be potentially significant and subject to mitigation.

Mitigation Measure BIO-2f: Implement Measures to Protect Other Special-status Nesting Birds

The following measures shall be implemented to minimize and mitigate the potential disturbance of nesting special-status birds.

- The City shall design Park Improvement Projects to minimize disturbance and removal of nesting habitat for special-status nesting birds to the extent feasible and practicable. Nesting habitat that cannot be avoided shall be removed during the non-nesting season, to the extent feasible and practicable.

- To avoid potential impacts to active nests of special-status birds, a qualified biologist shall conduct preconstruction surveys to identify active special-status bird nests within 500 feet of construction areas. The survey shall be conducted no more than 10 days before project activities begin. If an active nest is found, an appropriate buffer to minimize impacts shall be determined by a qualified biologist. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent upon it. The size of the buffer may vary, depending on the nest location, nest stage, and construction activity.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and the Disc Golf/ Trailhead Area Concept Plan

Timing/Implementation: Before and during construction during the breeding season of yellow warbler, yellow-breasted chat, and loggerhead shrike.

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-2f would reduce potentially significant impacts on neotropical migrant landbirds from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-2g: Adverse Effects of Park Improvement Projects on Special-status Fish Species

The Trails Plan calls for the construction of a new bridge/creek crossing in Upper Bidwell Park. The bridge crossings would be designed to span Big Chico Creek and would be installed using the City's Best Management Practices as outlined in the City of Chico Best Practices Technical Manual (City of Chico 1998). The City's Best Management Practices follow mandatory conditions set forth in the required U.S. Army Corp of Engineers and Department of Fish and Game permit review and approval process. These include measures such as using appropriate erosion and siltation controls during the construction period, stabilizing exposed soil and other fills at the earliest possible date, minimizing discharge of dredged or fill material in water of the United States, avoiding the removal of woody riparian vegetation, and restoring the stream channel within the high water mark following

the construction period. More importantly, any bridge crossing that would affect the bed and bank of Big Chico Creek would require a Streambed Alteration Agreement from DFG, which would require consultation with DFG, the state agency vested with the responsibility for protecting special-status fish species. The consultation with DFG would result in the identification of measures, if any, to mitigate impacts on special-status fish species.

Implementation of the Cedar Grove Area Concept Plan and Disc Golf/Trailhead Area Concept Plan do not involve work in or near Big Chico Creek; therefore, these projects would have no effect on habitat for special-status fish species, and no impact would occur. Horseshoe Lake is not considered habitat for special-status fish species.

Implementation of the four Park Improvement Projects would result in less than significant impacts on special-status fish species. No mitigation is required.

Applies to: Trails Plan

IMPACT BIO-3: ADVERSE EFFECTS ON RIPARIAN HABITATS OR OTHER SENSITIVE NATURAL COMMUNITIES

Effects of the BPMMP

Impact BIO-3a: Adverse Effects of the BPMMP on Riparian Habitats or Other Sensitive Natural Communities

Implementation of the BPMMP would result in the avoidance or minimization of disturbance or losses of sensitive natural communities or riparian habitats. The BPMMP includes goals and guidelines to ensure protection of natural resources, including native plant communities, in the Park. Natural Community Objectives O. NC-1 through O. NC-8 seek to preserve and enhance natural habitats in the Park by seeking to limit new development, encourage age diversity and regeneration of native plant communities, apply adaptive management strategies, and further develop and implement the NRMP for Bidwell Park. Plant Objectives O. P-1 through O. P-6 seek to protect native plants in the Park through protection of their habitat, education and outreach, the use of proper horticultural techniques, management and restriction of recreational activities in areas known to support special-status plants, monitoring, and consultation with the sovereign nation of the Mechoopda regarding propagation and gathering of native plants for cultural traditional. Aquatic Resources Objectives O. AR-2 through O. AR-4 seek to protect riparian and shaded riverine aquatic habitat, and Invasive Plant Objective O. IP-1 seeks to control or eliminate invasive plants that degrade natural communities. Natural Community Implementation Goals and Strategies I. NC-1 through I. NC-3 specifically call for the protection of sensitive habitats, implementation of the NRMP, and consideration of temporary or seasonal restrictions of Park use when resources are affected. Plant Implementation Strategies I. P-1, I. P-3, and I. P-5 through I. P-11 all provide guidance on the protection and management of sensitive natural communities. Compliance with these objectives and implementation strategies

and guidelines would ensure that the BPMMP would not result in substantial adverse effects on riparian habitats or other sensitive natural communities.

With the implementation of the BPMMP's protective objectives and implementation goals and strategies, effects on riparian habitats and other sensitive plant communities resulting from implementation of the BPMMP would be less than significant, and no mitigation is required.

Applies to: BPMMP

Effects of Park Improvement Projects

Impact BIO-3b: Adverse Effects of Park Improvement Projects on Riparian Forest

As described in the discussion of riparian forest in E4.3.3.1 above, Bidwell Park contains approximately 296 acres of Great Valley mixed riparian forest, 56 acres of Great Valley valley oak riparian forest, and 21 acres of white alder riparian forest. Riparian plant communities do not exist in the areas of the Horseshoe Lake Area Concept Plan and Disc Golf/Trailhead Area Concept Plan, and in areas identified for new trails in the Trails Plan. Therefore, implementation of the Horseshoe Lake Area Concept Plan and Disc Golf/Trailhead Area Concept Plan are not expected to result in adverse effects on riparian forest. The Trails Plan does, however, include the construction of a bridge in Upper Park. Depending on the exact location chosen for the bridge/creek crossing, a limited amount of riparian vegetation present at that crossing site may be affected.

The Cedar Grove Area Concept Plan would be implemented in an area adjacent to the Great Valley mixed riparian forest community on the banks of Big Chico Creek. This Concept Plan includes expansion and improvement of an existing parking lot and creation of an additional parking area in an existing clearing. Most of the Cedar Grove area is characterized by nonnative landscape vegetation, including a tree plantation known as the World of Trees. However, implementation of the Cedar Grove Area Concept Plan could result in removal of some Great Valley mixed riparian forest habitat along the northern boundary of Cedar Grove. In addition, indirect impacts such as soil compaction and vegetation trampling could result from visitor use.

Loss or degradation of riparian forests potentially resulting from implementation of the Trails Plan and the Cedar Grove Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Cedar Grove Area Concept Plan

Mitigation Measure BIO-3b: Implement Measures to Protect Riparian Forest

The following measures shall be implemented to mitigate potential impacts on riparian forest associated with implementation of the Trails Plan and Cedar Grove Area Concept Plan:

Trails Plan

- The amount of riparian forest affected by construction of new bridges or other activities occurring in or near riparian forest during implementation of the Trails Plan shall be limited to the minimum necessary.
- Any areas that require removal of riparian vegetation shall be restored with native riparian plant species.
- The City shall consult with DFG regarding the need for a Streambed Alteration Agreement before construction of any of the proposed bridges over Big Chico Creek.
- If a Streambed Alteration Agreement is deemed necessary for Big Chico Creek crossings, the City shall obtain the agreement before the start of any construction affecting the bed or bank of Big Chico Creek and shall implement all measures that are conditions of the agreement.

Cedar Grove Area Concept Plan

- The Cedar Grove Area Concept Plan shall be implemented to avoid or minimize degradation of areas supporting riparian forest vegetation. High priority shall be given to protecting riparian communities from activities that cause compaction, erosion, vegetation removal, or other degradation according to Natural Community Implementation Strategy I. NC-1.
- Where ground-disturbing activities occur in the immediate vicinity of riparian forest, exclusionary fencing shall be installed under the guidance of a qualified botanist along the outside edge of the riparian forest canopy before commencement of construction, to prevent workers and equipment from entering this sensitive habitat.
- If removal of riparian habitat is required for implementation of the concept plan, the amount shall be limited to the minimum necessary to achieve concept plan objectives.
- Any areas that require removal of riparian vegetation shall be restored with native riparian plant species.

Applies to: Trails Plan and Cedar Grove Area Concept Plan

Timing/Implementation: Before and during construction of a new bridge crossing over Big Chico Creek associated with implementation of the Trails Plan; before and during the construction of any components of the Cedar Grove Area Concept Plan located immediately adjacent to riparian forest.

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-3b would reduce potentially significant impacts on riparian forest from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-3c: Adverse Effects of Park Improvement Projects on Oak Woodland

Bidwell Park contains approximately 1,171 acres of blue oak woodland and savanna, 7 acres of canyon live oak forest, 368 acres of foothill pine–oak woodland, 109 acres of interior live oak woodland, and 403 acres of mixed oak woodland. Oak woodland communities occur throughout Middle and Upper Park, and valley oak riparian forest is the predominant community type in Lower Park. Blue oak woodland/savanna is found on the north side of the Horseshoe Lake area.

Oak woodland communities occupy more than half of the Disc Golf/Trailhead Area Concept Plan site. Some of the individual oak trees at this site have suffered from unmitigated use of the site as a disc golf course. An oak assessment was conducted by a certified arborist during development of the Disc Golf/Trailhead Area Concept Plan (Tree Associates 2005) to aid in understanding the health of on-site trees and to identify measures to help reduce future stressors. This assessment is included in Appendix E4. The study concluded that based on visual observations use of the site for disc golf is impacting the health of trees as a result of foliage and branch tip loss and soil compaction.

Blue oak woodland is typically considered a sensitive habitat by DFG and local agencies, although it is not currently tracked in the CNDDB. There is a great deal of concern about oak and other hardwood communities in California (Harris and Kocher 2002) due to the rapid rate of urban development in the foothills where these communities are predominantly found. It is estimated that more than a million acres of California's oak woodlands were lost between 1950 and 1988 (Bolsinger 1988) and loss of oak woodlands has continued at an alarming rate since that time. Recent studies suggest that oak and other hardwood habitats are indeed at risk in Placer County and throughout California (California Oak Foundation 2003, Saving and Greenwood 2002, Giusti and Merenlender 2002, Light and Pedroni 2002).

Implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan has the potential to affect oak woodland communities. Some of the trails proposed in the Trails Plan would be constructed in oak woodland communities. Direct impacts could result from conversion of oak woodland

habitat to other uses such as trails and parking areas. At the Disc Golf/Trailhead area, direct impacts to oak may also occur as a result of discs repeatedly striking the bark of oak trees which can eventually lead to cambium damage, resulting in reduced or slowed growth. Direct impacts to oak at this site may also occur from breakage of small branches as a result of disc strikes and retrieval activities by disc golfers. Breakage of branches or limbs exposes the tree's apical meristems, preventing or adversely affecting growth which can lead to tree deformity. Breakage also enhances the likelihood of infection or insect infestation, which can lead to premature death of the oak. Indirect impacts to oak trees at the respective Park Improvement Project sites could result from visitor use which may result in soil compaction and trampling of oak seedlings.

Direct loss or fragmentation of oak woodland or indirect effects on oak woodland such as habitat degradation and tree damage could occur as a result of implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan. This would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-3c: Implement Measures to Protect Oak Woodland

The following measures shall be implemented to mitigate potential impacts on oak woodlands resulting from implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan:

- Where possible, trails, improvements, and facilities shall be constructed outside of oak woodlands. The number of trails dissecting oak woodlands shall be minimized to the fewest number necessary to accomplish the goals of the site-specific Park Improvement Projects. The width of trails through oak woodlands shall be minimized and trails shall have clearly marked edges that discourage trail widening and deter users from straying off the designated trail.

- Trails through oak woodlands that are decommissioned as part of a site-specific Park Improvement Project shall be reclaimed using barriers (such as boulders) to discourage continued use of these trails.

- Grading, trenching, equipment storage, and other soil-disturbing or compacting activities shall not occur within the driplines of oak trees. New structures and impervious-surface materials shall not be placed in the driplines of oaks, except where deemed necessary to reduce the footprint size of tees as part of the proposed Disc Golf/Trailhead Concept Plan and to reduce soil compaction.

- To ensure that the driplines of oaks are not disturbed during construction, protective fencing shall be installed, under the guidance of a qualified botanist, certified arborist, or Registered Professional Forester, at least 1 foot beyond the outer edge of the driplines of all oaks that grow within the construction zones of the site-

specific Park Improvement Projects, and no project activities shall be allowed within these exclusion zones, unless specifically required as part of project construction.

- The oak woodland management guidelines contained in Section 3 of the NRMP (Appendix C of the BPMMP) shall be implemented. These guidelines include recommendations for sustaining oak woodlands, initiating a burning program, and maintaining the oak landscape.

In addition to the measures outlined above, the following additional measures shall be implemented in connection with development and ongoing maintenance of the proposed Disc Golf/Trailhead Concept Plan to protect oaks and to mitigate for any unavoidable loss resulting from mortality over time. These measures are based on site observations, oak woodland management guidelines provided by DFG, and measure recommended in the tree assessment (Appendix E4):

- Any modification to the proposed design and layout of the site shall be subject to the same impact avoidance and minimization criteria as the initial design;

- Information describing the value of native oak trees and the importance of the preservation and protection of oak woodland for wildlife habitat and the aesthetic values of Bidwell Park shall be provided at the informational kiosk at the Disc Golf/Trailhead area site. The information shall discuss the importance of avoiding direct impacts resulting from bark and limb damage as well as indirect effects such as soil compaction/root damage and shall encourage site users to act responsibly and prevent adverse effects.

- In cases where disc golf pins are located within groves of oak trees or oak trees are within fairways, measures to protect the tree trunks such as the installation of shielding pole structures shall be implemented. Installation shall be implemented without damage to the root zone, and in a manner that preserves the visual character of the site.

- In cases where tees or trails are located within driplines of oaks or in the immediate vicinity of driplines, a 6 inch layer of woodchip mulch shall be applied to a 20’ radius around the tees and on the trails to minimize soil compaction; this layer shall be maintained on a ongoing basis, as needed, to ensure continued protection of the root zones.

- Periodic monitoring of the oaks at the site shall be conducted to determine if any unavoidable impacts are occurring as a result of site use, in spite of the impact minimization measures.

- Any unavoidable impacts to oaks resulting from construction, or tree mortality resulting from ongoing use of the site shall be mitigated by replanting oak woodland habitat at the Disc Golf/Trailhead site in areas located outside of the footprint of facilities and trails.

- Oak planting should be from seeds (acorns) or seedlings that are obtained from the local genetic stock and should be of the same species as those targeted for replacement. Replacement ratios shall be at least 5:1 for trees lost/replaced that are greater than 5 inches diameter at breast height.

- Oak plantings shall be protected from browsing, planted on the north and east side of existing trees, and irrigated during the first few years as outlined in the oak assessment (Appendix E4) to enhance their chance of survival.

- Replacement plantings shall be monitored for their success for a period of five years. If planting does not succeed, remedial actions such as replanting shall be implemented.

- If requested, community/user group stewardship of the plantings shall be allowed to contribute to restoration/revegetation efforts under guidance and supervision by City staff.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before and during construction activities within or in the immediate vicinity of oak woodland habitat; ongoing for site management of the Disc Golf/Trailhead Area Concept Plan site.

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-3c would reduce potentially significant impacts on oak woodland from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-3d: Adverse Effects of Park Improvement Projects on Wildflower Fields

Wildflower fields within Bidwell Park are found in soils of the Tuscan Formation and other thin volcanic soils throughout Middle and Upper Parks, including areas traversed by proposed new trails, and particularly around Horseshoe Lake and along the south rim, including the Disc Golf/Trailhead Area Concept Plan. No wildflower fields are located at Cedar Grove. With the exception of the Disc Golf/Trailhead Area Concept Plan site, occurrences of the wildflower field community in the Park have not been precisely mapped and the total acreage of this community is unknown. Wildflower fields are widely distributed throughout the Disc Golf/Trailhead Area Concept Plan project site. Wildflower fields are considered a sensitive natural community under CEQA and are tracked in DFG's Natural Diversity Database.

Direct impacts, such as removal or degradation of wildflower fields, may occur as a result of implementation of the Trails Plan and Horseshoe Lake Area Concept Plan. The Disc Golf/Trailhead Area Concept Plan was designed with the objective to minimize adverse effects on sensitive resources, including wildflower fields. Potential

indirect impacts such as soils compaction or trampling, resulting in habitat degradation, could occur as a result of visitor use at the Park Improvement Project sites.

Loss or degradation of wildflower fields resulting from development and/or operation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-3d: Implement Measures to Protect Wildflower Fields

The following measures shall be implemented to minimize potential disturbances to wildflower field communities resulting from implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan:

- Mitigation Measure BIO-1d shall be implemented to minimize adverse effects on wildflower fields resulting from implementation of the Disc Golf/Trailhead Area Concept Plan.
- Before the start of construction activities associated with implementation of specific trail sections identified in the Trails Plan and the Horseshoe Lake Area Concept Plan, the City shall retain a qualified botanist to map the location and extent of wildflower fields in specific areas proposed for construction.
- Whenever possible, trail segments, site improvements, facilities and other design features shall be located to minimize impacts to wildflower fields.
- Exclusionary fencing shall be installed under the guidance of a qualified botanist before commencement of construction to keep workers and equipment from disturbing wildflower field habitat intended to be preserved on the project sites (some areas may be lost, consistent with site design).
- The number of trails dissecting wildflower fields shall be minimized to the fewest number necessary to accomplish the goals of the site-specific Park Improvement Projects.
- Trails through wildflower fields shall be as narrow as possible and shall have clearly marked edges that discourage trail widening and deter users from straying off the designated trail.
- Existing trails through wildflower fields that will not be retained as part of the site-specific Park Improvement Projects shall be reclaimed using barriers (such as boulders) to discourage use of these trails. If these reclaimed trails fail to revegetate on their own over time, re-seeding may be considered.

- Permanent signage shall be installed at kiosks located at the Horseshoe Lake and the Disc Golf/Trailhead Area Concept Plan sites to inform Park users of the presence and sensitivity of the wildflower field community and discourage visitors from off-trail use and trampling of vegetation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before and during construction of components of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan that occur within the immediate vicinity of wildflower fields

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-3d would reduce potentially significant impacts on wildflower fields from implementation of Park Improvement Projects to a less than significant level.

Impact BIO-3e: Adverse Effects of Park Improvement Projects on Northern Volcanic Mudflow Vernal Pools

The Park contains approximately 95 acres of habitat for northern volcanic mudflow vernal pools. These pools are primarily concentrated on the north side of Upper Park Road beginning at the entrance to Middle Park and extending east to Horseshoe Lake. Additional scattered pools are located along the south rim, including a few that occur at the proposed Disc Golf/Trailhead area. No vernal pools are located in the Cedar Grove area. Vernal pools typically qualify as jurisdictional waters of the United States subject to USACE jurisdiction under Section 404 of the CWA or waters of the state subject to Central Valley RWQCB jurisdiction under the state's Porter-Cologne Act.

Direct impacts such as removal or degradation of vernal pools may occur as a result of implementation of the Trails Plan and Horseshoe Lake Area Concept Plan. Four small vernal pools would be lost as a result of implementation of the Disc Golf/Trailhead Area Concept Plan. Potential indirect impacts on vernal pools could result from future facility improvements, maintenance or restoration activities, and visitor use, such as soils compaction, intrusion of pets, and vegetation trampling within the pools at any Park Improvement Project site containing vernal pools.

Loss or degradation of vernal pool habitat resulting from development of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Implementation of Mitigation Measure BIO-4 set forth below shall be required. Implementation of this mitigation measure would reduce potentially significant impacts on northern volcanic mudflow vernal pools from implementation of Park Improvement Projects to a less than significant level.

IMPACT BIO-4: ADVERSE EFFECTS OF PARK IMPROVEMENT PROJECTS ON JURISDICTIONAL WETLANDS

Effects of the BPMMP

Impact BIO-4a: Adverse Effects of the BPMMP on Jurisdictional Wetlands

Wetland habitats in the Park that would be subject to USACE jurisdiction under Section 404 of the CWA include vernal pools, freshwater seep/wet meadow, and seasonal wetland. In addition, Big Chico Creek and its tributaries are jurisdictional waters of the United States, and Horseshoe Lake may also qualify as waters of the United States. Jurisdictional wetlands are not known to exist at Cedar Grove. Additional wetlands such as seeps and additional small drainages may also exist in the Park. The precise acreage and boundaries of wetland habitat in the Park that may be subject to USACE jurisdiction is not yet known, as no park-wide wetland inventory has been conducted.

Implementation of the BPMMP is not expected to result in adverse effects on wetland and other waters of the United States because the BPMMP contains objectives and implementation strategies to inventory wetlands and protect wet meadows and other natural wetlands from incompatible recreational uses. These implementation strategies include:

- Protecting sensitive habitats (e.g., vernal pools, wet meadows) from activities that cause compaction, erosion, vegetation removal, or other degradation) (I. NC-1).
- Native plant planting programs designed for specific areas (I. P-2).
- Modifying existing recreation facilities to minimize potential effects on natural wetlands (I. P-3).
- Cataloging natural wetlands in the Park when funding or volunteer efforts are available (I. P-6).
- Avoiding the creation of new roads through natural wetlands (I. P-7).
- Removing old roads through natural wetlands and restoring the natural hydrologic flow (I. P-8).
- Preventing vehicles from compacting natural wetlands (I. P-9).

With the implementation of these strategies, impacts on jurisdiction wetlands resulting from BPMMP implementation would be less than significant. No mitigation is required.

Effects of the Four Park Improvement Projects

Impact BIO-4b: Adverse Effects of the four Park Improvement Projects on Jurisdictional Wetlands

Direct impacts on waters of the United States, including wetlands, may occur as a result of implementation of the Trails Plan and Horseshoe Lake Area Concept Plan. Four small vernal pools would be lost as a result of implementation of the Disc Golf/Trailhead Area Concept Plan. Potential impacts could also result from future facility improvements or from maintenance or restoration activities.

Concept Plans will be implemented according to Natural Community Objectives O. NC-1 through O. NC-6 and Plants Objective O. P-4 of the BPMMP to minimize direct and indirect impacts on wetlands and other waters of the United States. High priority will be given to protecting wetland habitats and waters of the United States from activities that cause compaction, erosion, vegetation removal, or other degradation according to Natural Community Implementation Strategy I. NC-1. Where possible, trails, improvements, and facilities associated with implementation of the Park Improvement Projects will be constructed away from wetland habitats and other waters of the United States. Trails and other facilities will be designed to avoid wetlands to the greatest extent possible and will be constructed in a manner that will not result in grade changes that could change the natural flow of water or result in discharge of sediment and other pollutants into wetlands and waters of the United States.

Even with implementation of the BPMMP's objectives and implementation strategies, some fill of jurisdictional wetlands will likely occur as a result of project implementation, due to the abundance of wetlands in the Concept Plan areas. Implementation of the Disc Golf/Trailhead Area Concept Plans would result in the loss or "fill" of four small vernal pools. Fill of jurisdictional wetlands and other waters of the United States as a result of the development of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Mitigation Measure BIO-4: Implement Measures to Protect Jurisdictional Wetlands

The following measures shall be implemented to mitigate impacts on waters of the United States:

- Before the implementation of specific components of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan that occur in the immediate vicinity of wetlands or other waters of the United States, a delineation of waters of the United States, including wetlands, that would be affected by the proposed projects shall be made by qualified biologists through the formal Section 404 wetland delineation process. The delineation shall be submitted to and verified by USACE.

- If, based on the verified delineation, it is determined that fill of waters of the United States would result from implementation of any of the site-specific Park Improvement Projects, authorization for such fill shall be secured from USACE through the Section 404 permitting process.

- The acreage of waters of the United States, including wetlands, that would be adversely affected by project construction shall be replaced or restored/enhanced on a "no net loss" basis in accordance with USACE regulations and City General Plan Policy OS. G-9. Habitat restoration, enhancement, and/or replacement shall be at a location and by methods agreeable to USACE, as determined during the Section 404 permitting process.

- Concurrently with the CWA Section 404 permit, the City shall obtain CWA Section 401 Clean Water Certification from the Central Valley RWQCB before project implementation.

- The City shall also coordinate with the Central Valley RWQCB regarding any wetland features that are not subject to USACE jurisdiction under Section 404 of the CWA, but may be subject to State regulation under the Porter Cologne Act. All conditions required by the RWQCB as part of the Section 401 Water Quality Certification process or Porter Cologne permitting process shall be implemented.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Before and concurrent with any component of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan that involve ground-disturbing activities in or near jurisdictional wetlands and/or waters of the state

Responsible Party: City of Chico

Implementation of Mitigation Measure BIO-4 would reduce potentially significant impacts on wetlands subject to USACE jurisdiction and wetland subject to the State's Porter Cologne Act resulting from implementation of Park Improvement Projects to less than significant.

IMPACT BIO-5: ADVERSE EFFECTS OF THE BPMMP AND PARK IMPROVEMENT PROJECTS ON WILDLIFE MOVEMENT, MIGRATION CORRIDORS AND THE EASTERN TEHAMA DEER HERD, AND NURSERY SITES

Bidwell Park is located within a transitional area between montane and valley biotic zones. The Big Chico Creek watershed, and particularly the riparian corridor along Big Chico Creek, functions as a linkage or wildlife movement corridor between higher and lower elevation habitats. As landscapes become increasingly fragmented, organisms that occupy remaining patches of suitable habitat may experience a reduction in habitat quality and area, and become at risk to various factors that can result in increased mortality or local extinction of populations.

Traditional migration corridors for the Eastern Tehama Deer Herd within the Big Chico Creek watershed have been documented, and the watershed is recognized as a critical migration corridor for the herd. Bidwell Park also has a high potential value in facilitating local and regional wildlife movements for other wildlife.

The BPMMP includes goals and guidelines to ensure protection of natural resources and is not expected to substantially change the spatial distribution of habitats, eliminate linkages between areas, or contribute to habitat fragmentation. The amount of habitat loss as a result of implementation of the site-specific projects would be small relative to the overall size of Bidwell Park, the existing extent and distribution of wildlife habitats within the Park and regionally, and the spatial (area) requirements of most wildlife species within the Park. Also, implementation of the BPMMP and site-specific projects would not substantially disrupt the continuity of the Big Chico Creek riparian corridor or other habitats across biophysical gradients.

Potential effects on wildlife movement corridors or access to nursery sites resulting from implementation of the BPMMP and the four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT BIO-6: FRAGMENTATION OF WILDLIFE HABITAT

Habitat fragmentation is a central issue of concern in conservation biology (Meffe and Carroll 1997). Several definitions of habitat fragmentation have been proposed (see Franklin et al. 2002); in general, however, fragmentation is the disintegration or subdivision of resources, ecological conditions, or habitat blocks into smaller, less continuous units. Fragmentation can result from land conversion, certain land uses (e.g., intensive timber harvest), and road development. However, the degree to which a landscape is considered "fragmented" is a complex issue and is species- and scale-dependent (Franklin et al. 2002).

Habitat fragmentation can exacerbate more direct effects of habitat loss by diminishing the value of remaining resource conditions or habitat units. This loss in value applies particularly to species that are positively associated with interior habitats, are negatively associated with biophysical characteristics of habitat edges or abrupt transition zones, require core areas, and are sensitive to the size and spatial distribution of habitat blocks.

The hydrologic, topographic, and elevation gradients in Bidwell Park support a diverse mix and distribution of plant communities and wildlife habitats, including riparian corridors along streams, oak woodland, pine-oak woodland, chaparral, and grassland. In addition to biophysical gradients, several other factors affect the existing distribution and quality of wildlife habitats, abundance and distribution of species, and animal community structure in Bidwell Park: recreation use, land use patterns and management activities, livestock grazing, natural disturbances (e.g., fire history), and demographic processes. The BPMMP includes goals and guidelines to ensure

protection of natural resources and is not expected to substantially change the spatial distribution of habitats or contribute to habitat fragmentation. The Trails Plan and Disc Golf/Trailhead Area Concept Plan would be implemented in areas where habitat fragmentation could be an issue. However, the amount of habitat lost with implementation of these two Park Improvement Projects would be small relative to the overall size of Bidwell Park, the existing extent and distribution of wildlife habitats within the Park and regionally, and the spatial (area) requirements of most wildlife species within the Park. The Horseshoe Lake Area Concept Plan and Cedar Grove Area Concept Plan are not expected to result in habitat fragmentation, as the elements contained in these places present upgrades to facilities that, for the most part, already exist.

Potential fragmentation of wildlife habitat resulting from implementation of the BPMMP and Park Improvement Projects would be less than significant both individually and cumulatively. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT BIO-7: CONFLICT WITH LOCAL POLICIES AND ORDINANCES

Development of the BPMMP and Park Improvement Projects has been guided by the City of Chico General Plan and Municipal Code, and consistency with the General Plan and Municipal Code has been a fundamental objective (see Section E4.3.8, "Land Use and Planning", impact discussion).

Implementation of the BPMMP and the four Park Improvement Projects would not result in conflicts with local policies and ordinances, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT BIO CUM-1

Implementation of the goals, objectives, and implementing strategies and guidelines of the BPMMP would not result in adverse effects on biological resources. While some impacts to biological resources would occur as a result of implementation of the Park Improvement Projects, these impacts are relatively minor and would only affect small areas of resources when compared with the overall size of the Park. In several cases, such as with implementation of the Trails Plan, Horseshoe Lake Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan, implementation of the Park Improvement Projects would reduce impacts to sensitive biological resources when compared to current conditions, because these projects have been designed to avoid or minimize impacts on these resources and would offsite a certain degree of resource damage currently resulting from unmitigated trail

use and unofficial use of the Disc Golf/Trailhead site for disc golf. This analysis contains mitigation measures that would reduce all impacts to biological resources resulting from implementation of the Park Improvement Projects to less than significant. Bidwell Park provides a large, continuous habitat for many plant and wildlife species. It also functions as a migration corridor for wildlife. These functions will be preserved and enhanced by implementation of the proposed corridor and no cumulative impacts to biological resources are expected to result from project implementation.

E4.3.4 CULTURAL RESOURCES

E4.3.4.1 ENVIRONMENTAL SETTING

Setting information regarding existing cultural resources in Bidwell Park can be found in Section 2.3.3 of the BPMMP. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to cultural resources are located in Section 3.5.3.3 of the BPMMP. An outline for a cultural resources management plan (CRMP) for the Park is included in Appendix D of the BPMMP. The regulatory framework pertaining to cultural resources is outlined below.

Previous cultural resources inventories and investigations identified 32 prehistoric archaeological and historic sites or potential sites within Bidwell Park. Please refer to the BPMMP for detailed information on these sites. Direct or indirect degradation resulting from existing trails, roads, or increased access by the recreating public has been documented at 11 of the 32 sites in the Park. The Humboldt Wagon Road, which has been determined to be eligible for listing on the National Register of Historical Resources (NRHP) and therefore, by default, on the California Register of Historical Resources (CRHR) is the only resource found eligible for such listing. Of the remaining 31 sites, 2 have been found ineligible for listing and the rest have not been assessed to date.

The portion of the Humboldt Road located within the Park appears as a cleared area approximately 600 meters in length and 5 meters in width with widely dispersed historic artifacts dating from the late 1800s. At other locations outside the Park, additional segments over one mile in length with associated rock walls and wagon ruts have been documented. During the evaluation of eligibility for listing as a significant historic resource, Vaughn (1996) recommended that the entire route appeared eligible to the NRHP under Criterion A, for its role in the development of transportation linking Chico with the goldfields of northern Nevada in the 1800s, and under Criterion C based upon the presence of rock retaining walls dating to the same time-period. Because of a lack of these features, the segment within the Park does not appear to be a contributing element to NRHP eligibility under Criterion C.

Although human remains have not been discovered thus far within Park boundaries, because of the presence of at least seven village locales, there is a strong potential for their presence. California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code Section 7050.5 and Section 7052 and California Public Resources Code Section 5097.

California Environmental Quality Act

Cultural resources in California are protected by a number of federal, state and local regulations and ordinances. In the absence of Federal involvement, the most frequently applied legislation consists of the provisions of CEQA that provide for the documentation and protection of significant prehistoric and historic resources. Prior to the approval of discretionary projects and the commencement of agency undertakings, the potential impacts of the project on archaeological and historical resources must be considered (Public Resources Code Sections 21083.2 and 21084.1 and the CEQA Guidelines [California Code of Regulations Title 14, Section 15064.5]).

The significance of an archaeological or historic resource as per the CEQA guidelines is an important consideration in terms of their management. Listing, or eligibility for listing, on the CRHR is the primary consideration in whether or not a resource is subjected to further research and documentation. As a matter of policy, public agencies should avoid damaging effects to historic and archaeological resources, particularly those that are CRHR-eligible. When impacts cannot be avoided, their affects can be mitigated through implementation of mitigation measures.

In addition, the State CEQA Guidelines require consideration of unique archaeological sites (Section 15064.5). If an archaeological site does not meet the criteria for inclusion on the CRHR but does meet the definition of a unique archeological resource as outlined in the Public Resource Code (Section 21083.2), it may be treated as a significant historical resource. Treatment options under Section 21083.2 of CEQA include a project that preserves such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

Public Resources Code Section 15064.5(e) of the State CEQA Guidelines also requires that excavation activities stop whenever human remains are uncovered and that the county coroner be notified to assess the remains. If the coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, Section 15064.5(d) CEQA Guidelines directs the lead agency to consult with the appropriate Native Americans as identified by the Native American Heritage Commission and directs the lead agency (or applicant) to develop an agreement with the Native Americans for the treatment and disposition of the remains.

CRHR Resource Significance

CEQA requires that resources eligible for listing on the CRHR be afforded degrees of protection ranging from preservation to the mitigation of adverse impacts. Determining the CRHR eligibility of historic and prehistoric sites is guided by the specific legal context of the site's significance as outlined in Sections 21083.2 and 21084.1 of the Public Resources Code (PRC), and the CEQA Guidelines (California Code of Regulations Title 14) Section

15064.5. In the CRHR, cultural resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. A cultural resource may be eligible for listing on the CRHR if it:

(1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage:

(2) is associated with the lives of persons important in our past;

(3) embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of an important creative individual or possesses high artistic values; or

(4) has yielded, or may be likely to yield, information important in prehistory or history.

In California, if a prehistoric or historic resource does not necessarily meet any of the four CRHR criteria, but does meet the definition of a "unique" site as outlined in the PRC (Section 21083.2), it may still be treated as a significant resource. This is the case if it is "… an archaeological artifact, object or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) It contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) It has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) It is directly associated with a scientifically recognized important prehistoric or historic event".

These two sets of criteria operate independently to ensure that significant potential effects on archaeological and historic resources are considered as a part of a project's environmental analysis. PRC guidelines also recommend provisions be made for the accidental discovery of archaeological sites.

E4.3.4.2 SIGNIFICANCE CRITERIA

An impact on cultural resources resulting from implementation of a proposed project would be considered significant if it would:

- Cause a substantial adverse change in the significance of historical resources as defined in Section 15064.5 (b)(1) of the State CEQA Guidelines;

- Cause a substantial adverse change in the significance of a unique archaeological resource as defined in Section 15064.5 (b)(1)&(2) of the State CEQA Guidelines; or

- Disturb any human remains, including those interred outside of formal cemeteries.

E4.3.4.3 METHODOLOGY

Potential impacts on cultural resources resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines and determining whether implementation of the BPMMP would result in potentially significant or significant effects.

Impacts of each of the four Park Improvement Projects were analyzed by reviewing the results of previous research, including known locations of cultural resources, and field surveys conducted within the Park. The conceptual Park Improvement Plans were projected onto or overlaid with maps of known resources and field inventories. Potential impacts consist of direct disturbance or alteration of the resource resulting from project implementation and indirect impacts that could result from altered Park use patterns that may compromise the integrity of a cultural resource during implementation or after project completion.

E4.3.4.4 IMPACT DISCUSSION

IMPACT CUL-1: CHANGE IN THE SIGNIFICANCE OF A HISTORIC OR UNIQUE ARCHAEOLOGICAL RESOURCE

Effects of the BPMMP

Impact CUL-1a: Change in Resource Significance with Implementation of the BPMMP

The BPMMP includes goals and guidelines to protect, avoid, or minimize disturbances to significant historic resources, including archaeological sites, unique archaeological sites, and areas of special tribal spiritual value to the sovereign Nation of the Mechoopda Indian Tribe of the Chico Rancheria. While not previously evaluated for significance, documented prehistoric resources within the Park range from isolated milling features and flaked and ground stone distributions to complex village locales. At least one of these prehistoric sites appears to be the location of an ethnographic village of importance to the sovereign Nation of the Mechoopda Indian Tribe. Historic resources consist of the remains of the Humboldt Wagon Road, a flume and four early homesteads. Of the 32 documented resources, three have been assessed for eligibility, and of these three sites, two have been identified as not eligible for inclusion in the CRHR or NRHP. The third site, the Humboldt Wagon Road, has been found eligible for listing on the NRHP and CRHR.

BPMMP objectives include extensive consideration of protecting important cultural resources, ethnographic/ Native American values, and archaeological sites. Specifically, these cultural resources objectives are as follows:

- Objective O.CR-1: Conduct a comprehensive Cultural Resource Assessment to identify resources for protection and preservation.
- Objective O.CR-2: Develop a CRMP to address proper management of cultural resources in Bidwell Park.
- Objective O.CR-3: Protect sensitive archaeological and cultural resources.
- Objective O.AS-1: Protect archaeological resources.
- Objective O.EB-1: Recognize natural springs and seeps as important seasonal gathering areas for botanical resources of special tribal spiritual values and maintain those areas with known cultural resource sites as compatible with other BPMMP goals.
- Objective O.EB-2: Protect meadows with archaeological significance.

The following cultural resources implementation strategies and guidelines associated with the above objectives would protect significant resources.

- Implementation Strategy I. CR-1: All known and newly discovered cultural/ethnographic resources should be inventoried and recorded by a qualified cultural resources specialist. Potential conflicts between cultural resource preservation and daily Park operations and public use should be assessed. Maps shall be used internally and shall not be made available to the public.
- Implementation Strategy I. CR-2: For those resources for which conflicts exist, assessments of resource significance shall be completed, and/or measures to reduce or eliminate detrimental effects shall be implemented.
- Implementation Strategy I. CR-3: For all known cultural resources which are not being adversely affected by current Park management and use, a monitoring plan shall be developed and implemented to ensure that conditions do not change.
- Implementation Strategy I. CR-4: Activities should be supported to increase public awareness of cultural resources, including their value as a link between the past and the present and the importance of preservation.
- Implementation Strategy I. CR-5: Consult with the sovereign Nation of the Mechoopda Indian Tribe of Chico Rancheria regarding the identification of traditional use areas and accessibility to native botanical resources that are necessary to the continuation of cultural traditions. These may involve the propagation and gathering of botanical resources, providing access to particular locales of special tribal spiritual value (such access and

use shall be consistent with management policies of Bidwell Park), and consulting on Park management decisions that may benefit or result in adverse effects to sovereign Nation of the Mechoopda cultural sites.

- Implementation Strategy I. CR-6: College and university resources and other groups and organizations should be utilized, as appropriate, to develop cultural resource access policies (information access, physical access) and to implement cultural resource site protection measures.

- Ethnographic Background Implementation Strategy I. EB-1: A partnership with the sovereign Nation of the Mechoopda Indian Tribe should be considered to develop and implement a gathering program and identify sites traditionally used for food, crafts, and medicine that could be gathered in ways and quantities that are consistent with the overall management of Bidwell Park.

- Archaeological Sites Implementation Strategy I. AS-1: Use conflicts at archaeological sites shall be identified and resolved.

- Archaeological Sites Implementation Strategy I. AS-2: Public access to information describing the location and extent of archaeological resources within Bidwell Park shall be restricted pursuant to State law.

Compliance with BPMMP objectives and implementation goals and strategies set forth above would ensure that the BPMMP would not result in substantial adverse effects on any historic or archaeological resource in the Park. Implementation of the BPMMP would also ensure that visitor use, development and facility expansion, maintenance and restoration, and other ground-disturbing activities would be conducted in accordance with Cultural Resources Objectives O. CR-1, O. CR-2, O. CR-3, and Archaeological Site Objective O. AS-1 and Cultural Resources Implementation Strategies and Guidelines I. CR-1 through I. CR-6, and Archaeological Sites Implementation Strategies and Guidelines I. AS-1, and I. AS-2.

Direct and indirect impacts related to changes in the significance of historic or archaeological resources with implementation of the BPMMP would be less than significant. No mitigation is required.

Applies to: BPMMP

Impact CUL-1b: Change in Resource Significance with Implementation of the Four Park Improvement Projects

Previous inventories and investigations have identified 32 prehistoric archaeological and historic sites or potential sites within the Park. Of these 32 sites, 11 have experienced direct or indirect degradation as a result of existing trails, roads, or increased access by the recreating public.

Closure of existing unmitigated, or volunteer trails, as proposed by the Trails Plan, may result in beneficial effects on historic and archaeological resources. Closure of volunteer trails may discourage Park use in areas where cultural resources are present, resulting in reduced potential for direct and indirect impacts. The degree of the beneficial impact is not known because large portions of the Park within which closures may occur have not been subjected to systematic cultural inventories.

Because resources are present in the vicinity of both existing and planned trail corridors, and only limited inventories and surveys have been conducted, there is a reasonable potential that additional undocumented cultural resources may be identified along the existing and proposed trail routes. Visitor usage along new trails has the potential to draw the public close to cultural sites, possibly resulting in indirect impacts through unauthorized collection. A review of previous research indicates that one prehistoric resource and a Works Progress Administration (WPA)–constructed dam and diversion canal dating to 1937 are located within or in the vicinity of the project site for the Horseshoe Lake Area Concept Plan. Neither of these resources has been assessed for significance to the CRHR or eligibility for the NRHP, so they are considered potentially eligible. In addition, because cultural resources inventories have not been conducted in the Horseshoe Lake area, other as-yet-unidentified resources may be present.

A review of previous investigations indicates that the remains of a prehistoric seasonal camp (CA-BUT-187), and village site (CA-BUT-187) are located adjacent to or within the footprint of the project site for the Cedar Grove Area Concept Plan. A historic barn was previously present on the site as well but was recently destroyed by fire. While none of these resources has been assessed for significance under CEQA for inclusion in the CRHR or for eligibility for the NRHP, both prehistoric sites appear eligible based on their potential to possess archaeological data in subsurface contexts. While the barn may have been eligible based on its reported association with John Bidwell, the resource no longer exists and thus will not be impacted by project construction. While it appears that the entire Cedar Grove project area has been inventoried (see Hamusek and Jenevein 1994), previously unidentified archaeological resources could be located in subsurface contexts that may be uncovered during project implementation.

The Disc Golf/Trailhead Area Concept Plan site was subject to a systematic archeological inventory (see Jensen and Jensen 2001). This inventory resulted in the documentation of a segment of the Humboldt Wagon Road and a rock shelter containing evidence of Native American occupation. The wagon road has been determined to be eligible for listing in the NRHP and, as such, also qualifies as a historical resource under the State CEQA Guidelines and is therefore eligible for inclusion in the CRHR. Subsequent archaeological testing of the cultural deposits contained within the rock shelter determined that the site is not a significant repository of archaeological materials subject to mitigation under Section 15064.5 of the State CEQA Guidelines, and the authors concluded that no further mitigation measures were warranted (Jensen and Jensen 2002).

As designed, Options A and B of the Disc Golf/Trailhead Area Concept Plan would impact a 500–700 foot-long segment of the Humboldt Wagon Road, resulting in direct and indirect impact to a significant historic resource that may significantly alter the resource and its immediate surroundings such that the significance of the historical resource would be materially impaired as outlined in Section 15064.5(b)(1) of the State CEQA Guidelines.

Construction of the proposed parking lot and associated facilities as outlined in the concept plans would directly affect a segment of the Humboldt Wagon Road, approximately 700 feet in length under Alternative A, a segment approximately 500 feet in length under Alternative B. The entire length of the recorded segment of the wagon road is approximately 1,900 feet, therefore direct impacts would compromise 26 to 37 percent of the route in this area. Based upon the intrusion of the associated facilities, the proposed Disc Golf/Trailhead has the potential to indirectly impact (or adversely change) the setting of other portions of the wagon road. A light scatter of historic artifacts associated with the route appears to be outside of the project footprint and will not be directly impacted by facilities construction.

Implementation of the four Park Improvement Projects may result in direct or indirect disturbance of cultural resources, resulting in potentially significant adverse changes in historic or archaeological resources. This potentially significant impact requires mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/ Trailhead Area Concept Plan

Mitigation Measure CUL-1: Protect Historic and Unique Archaeological Resources from Impacts

The City shall implement the following mitigation to reduce potential direct impacts on historic and unique archaeological resources:

- Consistent with the policies of the BPMMP, a qualified archaeologist shall conduct a cultural resources assessment of the proposed project site during project planning and design. For the Trails Plan, this can be accomplished on a segment by segment basis.
- If cultural resources are documented in the planning area, they shall be evaluated for their significance.
- If it has been determined by a qualified archaeologist that a cultural resource is significant, the project shall be designed or redesigned to avoid these cultural resources to the greatest extent feasible.
- If avoidance of significant sites is not feasible, mitigation in the form of data recovery shall be applied to archaeological sites.

- For portions of the Humboldt Wagon Road that cannot be avoided during implementation of the Disc Golf/ Trailhead Concept Plan, impacts would result in destruction of a portion of the route and intrusion of newer elements that would alter the immediate surroundings. As outlined in the management plan (see Jensen, et al. 1996; Table 2), this segment of the road appears significant based upon the associated archaeological deposit (NRHP Criterion D/CRHR Criterion 4), which will not be impacted by construction, and the association of the wagon road with John Bidwell. As currently designed, neither Alternative A nor Alternative B will result in destruction or alteration of the surroundings of the archeological deposit, and would impact only a percentage of the route associated with the original person responsible for its construction, John Bidwell. The surrounding environment of this segment of the route has been previously impacted by construction of a more recent dirt road that parallels the contemporary route of Highway 32, such that the immediate surroundings have been altered from what was present during the historic period. Therefore, because neither alternative would impact the archaeological deposit or substantially impair the significance of the resource as it relates to its association with a person of historic importance (NRHP Criterion B/CRHR Criterion 2), both alternatives would result in less-than-substantial adverse changes in the significance of this resource.

- Mitigation of any adverse changes resulting from direct impacts caused by implementation of the Disc Golf/Trailhead Area Concept Plan shall take the form of interpretive signage presenting an historic overview and the historic importance of the Humboldt route.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan and future Park Improvement Projects

Timing/Implementation: During final design of projects and during construction activities

Responsible Party: City of Chico

Implementation of Mitigation Measure CUL-1 would reduce potentially significant impacts on historic and unique archaeological resources from implementation of the four Park Improvement Projects to a less than significant level.

IMPACT CUL-2: DISTURBANCE OF HUMAN REMAINS

Impact CUL-2a: Disturbance of Human Remains with Implementation of the BPMMP

The BPMMP is a planning document and as such, implementation of the BPMMP would not result in impacts to the physical environment. Therefore, there would be no impact with regards to the disturbance on human remains. No mitigation is required.

Applies to: BPMMP

Impact CUL-2b: Disturbance of Human Remains with Implementation of the four Park Improvement Projects

Although human remains have not been discovered thus far within Park boundaries, because of the presence of at least seven village locales, there is a strong potential for their presence. Human remains could be discovered during future inventories, during implementation of the four Park Improvement Projects, or after a natural event that exposes subsurface deposits or vegetation that was previously obscuring the ground surface.

Disturbance of human remains resulting from implementation of the four Park Improvement Projects would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

Mitigation Measure CUL-2b: Protect Human Remains from Vandalism and Inadvertent Destruction

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities related to implementation of the Park Improvement Projects, all such activities in the vicinity of the find shall be halted immediately and the City or the City's designated representative shall be notified. The City shall immediately notify the county coroner and a qualified professional archaeologist. The coroner shall examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The responsibilities of the City for acting upon notification of a discovery of Native American human remains are identified in detail in the California Public Resources Code Section 5097.9. The City or its appointed representative (Park Director) and the professional archaeologist shall consult with a Most Likely Descendant (MLD) determined by the NAHC regarding the removal or preservation and avoidance of the remains and determine whether additional burials could be present in the vicinity.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: During construction activities

Responsible Party: City of Chico

Cumulative Impact Discussion

IMPACT CUM CUL-1

The BPMMP objectives include extensive consideration of protecting important cultural resources, ethnographic/ Native American values, and archaeological sites, and implementation of the BPMMP is expected to enhance the current management of cultural resources in the Park. The BPMMP also calls for the development of a Cultural Resources Management Plan. This plan, once developed and implemented, is expected to facilitate the long term protection and interpretation of important cultural resources in the Park. While implementation of Park Improvement Projects has the potential to adversely effect known and yet undocumented cultural resources in the Park, the overall acreage of these project is generally small when compared to the overall size of the Park. Furthermore, information on cultural resources presence will be used during the design or redesign of specific Park Improvement Projects. Any residual impact to significant cultural resources would be mitigated through implementation of mitigation measures CUL-1 and CUL-2b outlined above. Thus, implementation of the propose project is not expected to result in significant cumulative impacts on cultural resources.

E4.3.5 GEOLOGY AND SOILS

E4.3.5.1 ENVIRONMENTAL SETTING

Information on geology and soils in Bidwell Park can be found in Section 2.3.1.2 of the BPMMP. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to geology and soils are located in Section 3.5.3.1 of the BPMMP. Technical descriptions of the various soil types described for Bidwell Park can be found in Appendix E5. Regulatory information pertaining to geology and soils is provided below.

Federal

Earthquake Hazards Reduction Act

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program. To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA) by refining the description of agency responsibilities, program goals, and objectives.

The mission of NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and USGS.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (Public Resources Code Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "Earthquake Fault Zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo

Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code Sections 2690–2699.6), addresses earthquake hazards from nonsurface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. The Act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

National Pollutant Discharge Elimination System Permit

In California, the State Water Resources Control Board (SWRCB) administers regulations promulgated by the U.S. Environmental Protection Agency (55 Code of Federal Regulations [CFR] 47990) requiring the permitting of stormwater-generated pollution under the National Pollutant Discharge Elimination System (NPDES). In turn, the SWRCB's jurisdiction is administered through nine regional water quality control boards. Under these federal regulations, an operator must obtain a General Permit through the NPDES Stormwater Program for all construction activities with ground disturbance of 1 acre or more. The General Permit requires the implementation of best management practices (BMPs) to reduce sedimentation into surface waters and control erosion. One element of compliance with the NPDES permit is preparation of a Storm Water Pollution Protection Plan (SWPPP) that addresses control of water pollution, including sediment, in runoff during construction. (See Section 6.11, "Hydrology, Drainage, and Water Quality," for more information about the NPDES and SWPPPs.)

California Building Standards Code

The State of California provides minimum standard for building design through the California Building Standards Code (California Code of Regulations, Title 24). Where no other building codes apply, Chapter 29 regulates excavation, foundations, and retaining walls. The California Building Standards Code (CBC) applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations.

The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific

minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

E4.3.5.2 SIGNIFICANCE CRITERIA

An impact on geology and soils resulting from implementation of a proposed project would be considered significant if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would be come unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater, or otherwise not be consistent with the Chico Nitrate Action Plan or policies for sewer service control.

E4.3.5.3 METHODOLOGY

For the BPMMP, potential impacts related to geology and soils were analyzed by reviewing the goals, objectives, and implementing strategies and guidelines and determining whether implementation of the BPMMP would result in potentially significant effects.

For the four Park Improvement Projects, actions under each of the proposed Concept Plans were considered in relationship to the known seismic, geologic, and soils resources of the project area, and then were considered in relationship to project goals, objectives, and implementing strategies and guidelines; in particular, proposed new trail and bridge improvements were considered in relationship to the *Bidwell Park Trails Manual* (Park Department 1999).

E4.3.5.4 IMPACT DISCUSSION

IMPACT GEO-1: EXPOSURE TO SEISMIC HAZARDS

Surface rupture is an actual cracking or breaking of the ground along a fault during an earthquake. Structures built over an active fault can be torn apart if the ground ruptures. Surface ground rupture along faults is generally limited to a linear zone a few meters wide. The Alquist-Priolo Earthquake Fault Zone Act was created to prohibit the location of structures designed for human occupancy across the traces of active faults, thereby reducing the loss of life and property from an earthquake. No faults zoned under the Alquist-Priolo Act pass through or near the project site, nor is the project site underlain by any other known active faults (Hart and Bryant 1997, Jennings 1994).

Ground shaking, motion that occurs as a result of energy released during faulting, could potentially result in the damage or collapse of buildings and other structures, depending on the magnitude of the earthquake, the location of the epicenter, and the character and duration of the ground motion. Other important factors include the characteristics of the underlying soil and rock, the building materials used, and the workmanship of the structure. The closest active fault (i.e., fault that shows evidence of displacement during the last 11,000 years) is the Cleveland Hills Fault south of Lake Oroville, approximately 20 miles south of the project site (Jennings 1994). The Chico Monocline Fault runs through the eastern portion of the planning area; however, this fault has not been active since the early Quaternary period (approximately 1.6 million years ago) (Jennings 1994) and therefore is unlikely to generate strong seismic ground shaking. Active earthquake faults west of the project site within the Coast Ranges, and along the western margin of the Sacramento Valley, could result in strong seismic ground shaking at the project site. However, this project does not propose structures intended for human habitation.

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid. Factors determining the liquefaction potential are soil type, the level and duration of seismic ground motions, distance from the seismic source, the type and consistency of soils, and the depth to groundwater. Loose sands and peat deposits are susceptible to liquefaction, while clayey silts, silty clays, and clays deposited in freshwater environments are generally stable under the influence of seismic ground shaking. Liquefaction poses a hazard to engineered structures. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on

retaining or basement walls, and slope instability. Because of the distance from the project site to known active faults, the soil types on the project site, and the fact that this project does not propose structures intended for human habitation, hazards associated with liquefaction would be minor.

Because of the distance from the project site to known active faults that are likely to produce strong seismic ground shaking, hazards from seismically induced landslides would be minor.

Seismic hazards resulting from implementation of the BPMMP and four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT GEO-2: POTENTIAL FOR SOIL EROSION

Rock units within the Park consist of materials from the Pleistocene-age Red Bluff Formation and Modesto Formation, Pliocene-age volcanic materials of the Tuscan Formation, Miocene-age volcanic materials of the Lovejoy Basalt, and late Cretaceous–age materials of the Chico Formation (Saucedo and Wagner 1992). Weathering of these rocks over time has given rise to approximately 30 different soil types at the project site, as shown in BPMMP Exhibit 2.3.1-1 (based on the Butte County Soil Survey). Most of the project site soils have a high to very high potential for runoff, indicating that the potential for erosion by water is also high. Erosion of the underlying rock materials is a natural process that occurs throughout the surface of the earth, and it is one of the processes by which new soils are formed. However, the process of erosion can be accelerated by certain human activities, and in some cases can result in detrimental effects on the environment such as loss of plant and animal habitat, and loss of fish and other aquatic habitat as streams and lakes become clogged with sediment. The proposed BPMMP and Park Improvement Projects—particularly the Trails Plan—all identify a number of specific areas in the Park and specific trails where accelerated erosion is taking place.

In general, erosion problems in the Park are exacerbated by two factors: creation of new paths or trails by Park users who do not stay on the marked trails, and the need for maintenance activities on existing trails. These are common challenges faced by park systems throughout the nation. Experience has demonstrated that it is difficult to keep park users from straying off trails and creating new, unmaintained paths. The best way to prevent this from happening is through efforts to educate park users about the detrimental effects to the environment that occur when users stray off the marked trails. In some cases, use trails are created by recreationists in locations where a new trail should be established to provide better connectivity with existing trails or to improve the recreation experience by providing access to scenic viewpoints.

The BPMMP contains objectives and implementation strategies and guidelines to address increased user education, creation of new trails to improve connectivity and provision of more recreation opportunities, and closure of existing unauthorized trails and roads. Specifically, Trails Objectives O. T-1 and O. T-2; and Trails Implementation Strategies and Guidelines I. T-1, T-2, T-6, T-7 through T-10, T-15, T-16, and Circulation and Access Implementation Strategies and Guidelines I. C/A-7 and I. C/A-8, and Design Standard Implementation Strategy and Guideline I. DS-5 intend to address these issues.

In addition, appropriate maintenance strategies need to be implemented on a continuing basis to control erosion. The BPMMP incorporates the following objectives and implementation strategies related to erosion:

- Geology and Soils Objectives O. G/S-1 (calls for periodically assessing soil conservation and erosion potential to determine and modify protective measures), O. G/S-3 (calls for conserving shallow Park soils to the maximum extent feasible), and O. G/S-4 (calls for recognizing improperly designed roads, trails, and parking areas as sources of erosion and assessing them to form the basis for soil conservation measures), and Geology and Soils Implementation Strategies I. G/S-1 (calls for minimizing loss or degradation of unique or rare soil and hydrologic conditions from recreation uses), I. G/S-2 (calls for utilizing the Trails Manual to reduce soil erosion), I. G/S-3 (calls for using best management practices [BMPs] when constructing or maintaining roads to minimize soil erosion and loss), I. G/S-5 (calls for identifying erosion and developing methods to control it and restore those sites), and I. G/S-6 (calls for assessing the condition and erodibility of the Park soils when planning and managing recreational uses).

- Trails Implementation Strategies and Guidelines I. T-3, I. T-4, I. T-5 (call for a maintenance program with sufficient funding and staff, a list of priority maintenance areas, and a long-term strategy to ensure funding, respectively), I. T-11 (calls for cataloging trail conditions), I. T-12 (calls for cataloging natural resources to determine the need for mitigation measures), I. T-13 (calls for consulting with professional trail planners and natural resource scientists to develop the best ways to respond to trail management issues), and I. T-14 (calls for establishing, maintaining, and renovating trailheads and day-use areas); and

- Maintenance and Operations Objectives O. MS-2 (calls for establishing a dependable base funding source)and O. MS-3 (calls for periodic staff training that supports, for example, natural and cultural resource protection) and Maintenance and Operations Implementation Strategies and Guidelines I. MS-2 (calls for utilizing maintenance methods that minimize adverse effects on natural conditions), I. MS-3 (calls for staff training for resource protection and goals for recreational opportunities), I. MS-4 (calls for following BMPs), and I. MS-5 (calls for discussing the maintenance requirements when new facilities and programs are proposed).

The BPMMP also incorporates by reference a Best Practices Technical Manual, which includes the grading standards of the Chico Municipal Code, and also includes a Stormwater Management section with policies

intended to reduce erosion potential. The BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, and Cedar Grove Area Concept Plan all rely primarily on implementation of the standards and guidelines for trail management contained in the Bidwell Park Trails Manual (Park Department 1999) to control erosion problems. The Trails Manual contains specific, detailed instructions for appropriate creation of new trails and maintenance of existing trails, which, when implemented, would reduce erosion impacts in the Park below existing conditions. The BPMMP and the Trails Plan also contain provisions to hire a professional, independent trails consultant and designer to implement site-specific erosion-related solutions at Monkey Face and along certain portions of the North Rim Trail.

Environmental criteria that were included in the design process of the proposed Disc Golf/Trailhead Area Concept Plan included thin soil, erodible areas that were identified for impact minimization by minimizing the footprint of trails and tees. The design criteria also identified certain areas that were to be restored or set aside to reduce erosion effects, including portions of the short course that have been damaged by previous unmitigated use; establishment of setbacks from cliff faces; and the provision of designated areas for uses other than disc golf (i.e., staging areas, scenic view spots) to reduce the amount of off-trail use. Disc Golf Implementation Strategies and Guidelines I. DG/T-4, DG/T-9, and DG/T-10 of the BPMMP specify that construction, materials, and maintenance specifications shall be developed and approved before the start of any work at the site; that the disc golf course area shall be inspected periodically to assess potential degradation of resources, and course management and maintenance procedures shall be adjusted as necessary; and that suspension of disc golf play during wet weather conditions would be considered as a management strategy. Furthermore, construction and maintenance of proposed trails in the disc golf course area would be subject to the standards and guidelines contained in the Bidwell Park Trails Manual (Park Department 1999). The environmental criteria used in the design of the disc golf course, in combination with the BPMMP Implementation Strategies and implementation of the standards contained in the Trails Manual, would reduce erosion impacts of the proposed Disc Golf/Trailhead Area Concept Plan.

Adherence to the implementation strategies in the BPMMP, the City's BMP Manual, and the methods outlined in the Trails Manual would also ensure that future trails would not result in significant erosion and that existing trail continue to be managed in a way that prevents or minimizes erosion. The Trails Plan identifies certain problem areas requiring redesign and also identifies numerous informal trails for closure. Adherence to the Trails Plan would therefore reduce the extent of erosion in the Park when compared with existing conditions.

The potential for soil erosion resulting from implementation of the BPMMP and the Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

IMPACT GEO-3: HAZARDS RELATED TO UNSTABLE SOILS

A landslide is the downhill movement of masses of earth material under the force of gravity. This process typically involves the surface soil and an upper portion of the underlying bedrock. The factors contributing to landslide potential are steep slopes, unstable terrain, lack of vegetative cover, and depth to groundwater or amount of rainfall. Portions of the project site, particularly areas of Upper Park, contain steep slopes with potentially unstable soils; during heavy winter rain events when the soil becomes saturated, landslides could occur.
The BPMMP includes goals and guidelines to address geology and soils resources in the Park. As discussed previously, implementation of the BPMMP would ensure that visitor use, development and facility expansion, maintenance and restoration, and other ground-disturbing activities would be conducted in accordance with the Bidwell Park Trails Manual and BPMMP:

- Geology and Soils Objectives O. G/S-1 (calls for periodically assessing the potential for soil conservation and erosion to determine and modify protective measures) and O. G/S-4 (calls for recognizing improperly designed roads, trails, and parking areas as sources of erosion and assessing them to form the basis for soil conservation measures), and Geology and Soils Implementation Strategies and Guidelines I. G/S-2 (calls for utilizing the Trails Manual to reduce soil erosion), I. G/S-3 (calls for using best management practices [BMPs] when constructing or maintaining roads), I. G/S-5 (calls for identifying erosion and developing methods to control it and restore those sites) and I. G/S-6 (calls for assessing the condition and erodibility of the Park soils when planning and managing recreational uses);

- Trails Objective O. T-1 (calls for creating a multiuse trail system that considers trail maintenance, the Trail Manual standards, user demands, trail closure for habitat rehabilitation, support facilities, closure of unofficial trails, and bike routes that connect to the Chico Bicycle Pathway system), Trails Implementation Strategies and Guidelines I. T-1 through I. T-14, which call for trails to maintain the City's Trail Plan standards; provide a variety of trail types; have sufficient funding, planning for funding sources, and staff; and have a list of priority maintenance. These strategies also call for carefully evaluating of new trail locations to avoid potential adverse effects on natural resources, identifying acceptable trail uses, creating a sign system, discouraging the creation of unofficial trails, educating users about their adverse affects on the trails, cataloging natural resources and the trail network, consulting with professionals and scientists about how to best respond to trail issues, and establishing, maintaining, and renovating trailheads and day-use areas;

- Maintenance and Operations Implementation Strategy and Guideline I. MS-4, which calls for sound resource preservation, horticulture, and maintenance practices following BMPs; and

- Design Implementation Strategy and Guideline I. DS-5, which calls for developing a signage system that guides Park users regarding facility locations and Park rules.

In particular, the Bidwell Park Trails Manual (Park Department 1999) contains provisions for temporary trail closure during wet conditions. Temporary closures not only protect fragile soils from erosion, but also serve to protect users from hazards that could occur on unstable slopes.

The potential hazard to recreational users from landslides with implementation of the BPMMP and the four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan and future Park Improvement Projects

IMPACT GEO-4: HAZARDS RELATED TO EXPANSIVE SOILS

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried. Because of this effect, building and road foundations may rise during the rainy season and fall during the dry season. If this expansive movement varies underneath different parts of a single building, foundations may crack, structural portions of the building may be distorted, and doors and windows may become warped so that they no longer function properly. The potential for soil to undergo shrink and swell is greatly enhanced by the presence of a fluctuating, shallow groundwater table. Most of the soils on the project site consist of gravelly loams with high percentages of cobbles, gravels, boulders, and sand. Of the 30 soil types at the project site, only three contain high (35% or more) percentages of clay; therefore, the construction of new roads and trails should not be affected by expansive soils. Furthermore, this project does not propose the construction of residences or commercial buildings where foundation damage would be a potential issue.

Potential hazards related to expansive soils with implementation of the BPMMP and the four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT GEO-5: SOIL LIMITATIONS FOR SEPTIC SYSTEMS

Restroom facilities in the Park currently consist of several types:

- Temporary or permanent vault toilets (from which the waste is pumped on a regular basis),
- Composting toilets (self-contained units that include bacteria to break down waste material),
- Chemical toilets (self-contained units that require application of chemicals to break down waste material), or

- Facilities that are connected with the City's Water Pollution Control Plant.

Toilets of the vault, composting, or chemical type are self-contained units from which the waste is removed, and therefore do not require installation of a septic system; these toilets do not require a permit from Butte County Department of Environmental Health (BCDEH) and their installation and use at the Park is considered a less than significant impact.

Installation and use of toilets at the Park would result in a less than significant impact related to soils and septic systems. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM GEO-1

The BPMMP includes objectives and implementation goals and guidelines aimed at preventing and reducing erosion in the Park. Implementation of the BPMMP and the associated Park Improvement Projects is expected to reduce erosion when compared with existing condition through implementing BMPs, eliminating "problem" trails, reducing the number of informal trails, and bringing all trails up to Trails Manual Standards. While implementation of Park Improvement Projects has the potential to result in short term erosion during construction, the overall acreage of these areas is generally small when compared to the overall size of the Park. These impacts would be mitigated through implementation of BMPs as outlined in Section 4.3.7, "Hydrology and Water Quality." Thus, implementation of the proposed project is not expected to result in cumulative impacts on geology and soil resources.

E4.3.6 HAZARDS AND HAZARDOUS MATERIALS

E4.3.6.1 ENVIRONMENTAL SETTING

Bidwell Park has experienced many uses since it was first deeded to the City. Initially, several special-interest groups were able to secure areas of the Park for their specific use, some of which resulted in the deposit of hazardous materials within the Park boundaries. Other hazards occur naturally as the result of people recreating in an area that contains steep slopes, fast-rushing currents, and wild animals. An overview of existing hazards and hazardous materials is presented below.

Naturally Occurring Hazards

Wildland Fire

The City of Chico Park Department commissioned a study in 1991 that resulted in the Wildfire Management Plan for Bidwell Park (California Fire Safe Consultants 1991). This study concluded that there are serious wildfire problems in Bidwell Park. The study indicated that the most serious threat occurred in Lower Park, because of the proximity of residential structures. The Wildfire Management Plan also concluded that wildfires are not uncommon in Upper Park, and cited Chico Fire Department records indicating that approximately 162 wildfires had occurred in Bidwell Park between 1981 and 1990.

The findings of the Wildfire Management Plan stated that there exists a serious potential threat to life, the "magnificent valley oak woodlands" of Lower Park, and private property from wildfires for the following reasons:

- A growing accumulation of hazardous wildland vegetation, especially in Lower Park.
- Mediterranean weather conditions with periodic winds that dry the vegetation and can fan wildfires.
- An increasing risk of ignition resulting from increased use of the Park.
- The City conducts controlled burns in the Park to eradicate nonnative vegetation.

According to the Big Chico Creek Existing Conditions Report (Big Chico Creek Watershed Alliance and California State University Chico Office of Watershed Projects 2000), the north portion of the Park running along Upper Park Road is the area at greatest risk of ignition because of its dry fuels, heavy use, and presence of vehicles. The fuels are generally thicker on the north-facing slopes of the South Rim, but less use here means that there is a lower threat of ignition.

Volcanic Hazards

The closest of the major Cascade Mountain peaks to Bidwell Park is Mount Lassen, approximately 50 miles away. Lassen Peak was last active in 1914, when it erupted. According to the Master Environmental Assessment

prepared for the City of Chico General Plan (City of Chico 1999), should Mount Lassen erupt again, heat and molten lava would not be expected to reach the Chico area.

Steep Slopes

Many of the hiking trails (both official and unmitigated) in Bidwell Park are located on the rims of the canyon walls. If one goes off-trail, there is the danger of slipping and falling down one of these slopes, as evidenced by the spring 2003 death of an individual intent on retrieving a disc at the disc golf course, and another injury that occurred in spring 2003 when an individual fell off a steep cliff while watching the sunrise.

Potential Flooding

The construction of the Lindo Channel and Sycamore Creek Diversions and their use as flood control facilities has removed any threat of serious flooding from Big Chico Creek to the city of Chico. Minor flooding does occur annually during heavy rains at Annie's Glen, which is a low-lying area along Vallombrosa Avenue, downstream of the Mangrove Bridge. The slight flooding that occurs has not affected city streets or bridges, and only the picnic area receives floodwaters.

Tunnel Tubes at Swimming Holes

Occurrence of underwater tunnels, primarily in the vicinity of Bear Hole and other areas of Lovejoy Basalt, has created swimmer entrapment hazards. Several drowning deaths have occurred in Big Chico Creek as a result of these geologic formations.

Water Quality Contamination

Degradation of water quality as a result of contamination with metals, fecal coliform, chemicals, etc., is an issue for human, animal, and aquatic organisms. Please see Section E4.3.7, "Hydrology and Water Quality," for a discussion of water quality monitoring.

Human-Made Hazards

Former Military Practice Range

According to Bruce Gray, a board member of the Chico Rod and Gun Club, a military practice range existed near the current Easter Day cross. Practice shots were directed toward the bluff north of Horseshoe Lake. Practice ranges may also have existed near the current Wildwood Park and north of Horseshoe Lake. Practice shooters north of the lake aimed toward the bluffs to the east. Practice shooters near Wildwood Park may have shot to the north of the current road. It is possible that metal contamination or unexploded ordnance may still exist as a result of practice shooting in these areas. In 2005, the City completed work under a Voluntary Clean-up Agreement with

DTSC for the former skeet/rifle and pistol ranges. The containment cell is under permanent protection and will be maintained as required by the Agreement. Exhibit 4.3.6.1-1 shows the area treated under the Clean-up Agreement.

Electromagnetic Fields

Upper Park is traversed by a 230 kV and a 500 kV power line. Within the last 10 years or so, public awareness of the potential health risks from exposure to electromagnetic fields (EMF) has risen. Electric fields are created by differences in voltage: the higher the voltage, the stronger will be the resultant field. Magnetic fields are created when electrical current flows: the greater the current, the stronger the magnetic field. An electric field will exist even when there is no current flowing. If current does flow, the strength of the magnetic field will vary with power consumption, but the strength of the electric field will be constant. Proximity to power lines, cellular phones, radar, microwave towers, video display terminals, electric blankets, and appliances can result in exposure to EMFs.

Although no proof exists that exposure to EMF causes health problems or disease, the World Health Organization, among other entities, recommends limiting occupational and residential exposure to EMFs (World Health Organization n.d.). Other utility companies and some jurisdictions also recommend prudent avoidance as the best way to limit exposure.

Conflicting Uses on Trails

Many of the trails in Bidwell Park are used by hikers, bicyclers, and equestrians. Levels of trail use by these groups depend upon the condition, slope, and placement of the trails. Potential for conflict between these uses exists; however, the majority of participants in the March 25, 2005, Citizen's Advisory Committee meeting for this project, which focused on trails in Bidwell Park, did not consider conflicting trail uses to be an issue of concern.

Remnants of Barbed Wire

Remnants of old barbed and woven wire fences remain in Upper Park, and could potentially create an impediment and danger to wildlife and Park users. The precise location and quantity of fencing is unknown. Most of these residual fences are on the south side, but there are also several areas of fencing on the north near the east end of the Park. Leftover fencing may also be present in the Five Mile area.

E4.3.6.2 SIGNIFICANCE CRITERIA

An impact related to hazards and hazardous materials resulting from implementation of a proposed project would be considered significant if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Result in a safety hazard for people residing or working in the project area, for a project located within an airport land use plan;
- Result in a safety hazard for people residing or working in the project area, for a project within the vicinity of a private airstrip;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.
- Conflict with local policies and ordinances.

E4.3.6.3 METHODOLOGY

Potential impacts related to hazards and hazardous materials resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines pertaining to hazards and hazardous materials and determining whether implementation of the BPMMP would result in potentially significant or significant effects.

For the four Park Improvement Projects, the conceptual project plans were analyzed in terms of their potential impacts related to hazards and hazardous materials, particularly where wildland fire and trails are concerned. Whenever possible, potentially affected areas were quantified. Impacts analyzed include both direct impacts resulting from project implementation (BPMMP implementation or construction of the specific Park Improvement Projects) as well as indirect impacts that could result from altered use patterns of a certain area once the project is implemented. The analysis aims to identify both adverse and beneficial impacts.

E4.3.6.4 IMPACT DISCUSSION

IMPACT HAZ-1: USE OF HAZARDOUS MATERIALS ON-SITE

Impact HAZ-1a: Use of Hazardous Materials with Implementation of the BPMMP

Implementation of the goals, objectives, and implementation strategies and guidelines contained in the BPMMP would not create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials. The proposed trail maintenance, upgrade, and abandonment would not involve the use or transport of hazardous materials. No handling or delivery of hazardous materials, substances, or waste is anticipated as a part of the BPMMP.

However, Objective Golf Course Objective O. GC-1 of the BPMMP states that a public golf course will continue to be provided in Bidwell Park. Golf course maintenance personnel regularly apply insecticides, herbicides, fertilizers, and fungicides to the fairways and greens on the course. These chemicals can be toxic or otherwise harmful to humans, fish, or wildlife. For this reason, limitations are placed on their use and methods of application are restricted. The Butte County Agricultural Commissioner's Office administers state laws regulating the application of these materials and carefully controls the use of these materials and disposal of waste and containers. Controls include concentrations of mixtures, methods, and timing of applications, and worker handling of materials. These restrictions would limit the exposure of golfers continuing to play on the existing golf course to hazardous materials. Furthermore, the golf course conducts quarterly sampling using standard protocols and submits the results to the City. To date, all results have been negative. Impacts to Hydrology and Water quality are discussed in Section E 4.3.7.

With the implementation of the BPMMP's protective objectives, effects related to use of hazardous materials would be less than significant. No mitigation is required.

Applies to: BPMMP

Impact HAZ-1b: Use of Hazardous Materials with Implementation of Park Improvement Projects

The renovation, upgrade, and/or abandonment of existing trails as described in the Trails Plan does not include the use, transport, or disposal of hazardous materials.

Implementation of the Horseshoe Lake Area Concept Plan includes the expansion of parking lots, installation of a restroom and picnic areas and installation of trails. Edge conditions proposed for Horseshoe Lake include boulders, wetland edges, and gravel edges. None of these improvements would involve the use, transport, or disposal of hazardous materials.

Improvements planned for the Cedar Grove area include the expansion of paved parking lots and construction of an interpretive center, maintenance barn, and an information/orientation plaza. Informational signs and seating areas are also planned. None of these improvements would involve the use, transport, or disposal of hazardous materials.

Removal, expansion, upgrade, and rerouting of existing fairways and tees, as well as installation of a parking lot, restroom, trails, scenic overlook and signage at the Disc Golf/Trailhead area would not involve the use, transport, or disposal of hazardous materials.

Implementation of the four Park Improvement Projects would have no impact related to use of hazardous materials. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

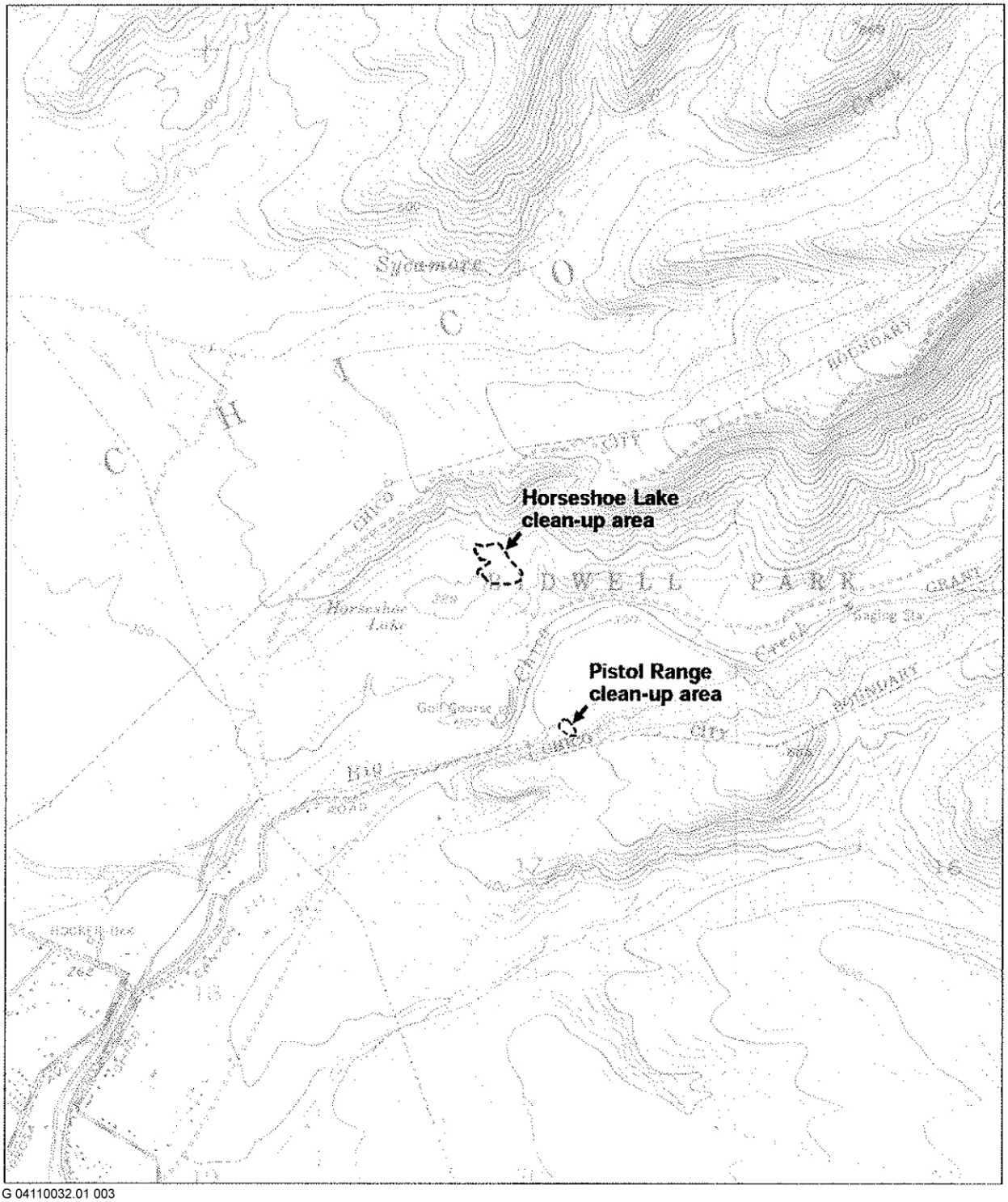
IMPACT HAZ-2: POTENTIAL FOR RELEASE OF HAZARDOUS MATERIALS INTO THE ENVIRONMENT

No active hazardous materials sites are located on or near Bidwell Park and there is a low potential for unrecorded contamination to occur in Bidwell Park. The only known location of hazardous materials (former skeet/rifle and pistol ranges) underwent a cleanup effort in 2005 and no longer poses a threat to the environment.

The activities proposed in the BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan would not require the use of hazardous materials. No fueling stations, chemical storage areas, or other sources of hazardous materials are proposed or would be required for implementation of the BPMMP or the Park Improvement Plans. Minor amounts of hazardous materials may be stored on-site during construction or present in construction vehicles. Provisions to protect the public and the environment from discharge of these materials used during construction are to be included in Storm Water Pollution Prevention Plans, which are required as part of construction projects (please refer to Section E4.3.7, "Hydrology and Water Quality"). Neither construction nor implementation of proposed activities is likely to cause a release of hazardous materials into the environment.

The potential for release of hazardous materials resulting from implementation of the BPMMP and Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan



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Source: Resource Design Technology, Inc. 2006

Horseshoe Lake Cleanup Site Locations **Exhibit E4.3.6.1**

IMPACT HAZ-3: HAZARDS WITHIN 1/4 MILE OF A SCHOOL

Parkview Elementary School is located adjacent to the southeastern edge of Cedar Grove. No other schools are located within ¼ mile of Bidwell Park. The Big Chico Creek Nature Center, while not a school, serves as an indoor and outdoor "classroom" for children from the local community. The Park uses proposed in the BPMMP and implementation of the four Park Improvement Projects would not emit hazardous substances, nor would they handle hazardous or acutely hazardous materials, substances, or waste.

Implementation of the BPMMP and Park Improvement Projects would not result in hazards within ¼ mile of a school, resulting in no impact. No mitigation is required.

IMPACT HAZ-4: LOCATION ON A SITE THAT IS INCLUDED ON A LIST OF HAZARDOUS MATERIALS SITES COMPILED PURSUANT TO GOVERNMENT CODE SECTION 65962.5 AND, AS A RESULT, CREATION OF A SIGNIFICANT HAZARD TO THE PUBLIC OR THE ENVIRONMENT

Bidwell Park contains a former military practice range near Horseshoe Lake. Exposure of the public to lead and other metals at this site was a concern in the past. In 2005, the City completed work under a Voluntary Clean-up Agreement with DTSC for the former skeet/rifle and pistol ranges. The containment cell is under permanent protection and will be maintained as required by the Agreement. As such, the site does not pose a threat to the public or the environment. Bidwell Park does not include any additional sites that are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, implementation of the BPMMP and four Park Improvement Projects would not result in a significant hazard to the Public or the environment. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan

IMPACT HAZ-5: AIRPORT-RELATED SAFETY HAZARDS FOR RESIDENTS OR WORKERS IN THE PROJECT AREA

Bidwell Park is not located either within an airport land use plan or within the vicinity of a private airstrip. Therefore, there is no potential for safety hazards for residents or workers in the project area related to the presence or proximity of an airport.

No airport-related safety hazards would result from implementation of the BPMMP or Park Improvement Projects, resulting in no impact. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HAZ-6: IMPAIRMENT OF OR INTERFERENCE WITH AN ADOPTED EMERGENCY RESPONSE PLAN OR EMERGENCY EVACUATION PLAN

Implementation of the goals, objectives, and implementation strategies and guidelines in the BPMMP and implementation of the four Park Improvement Projects would not impair implementation of or physically interfere with emergency response or evacuation plans. Beneficial impacts may result from implementation of Public Safety and Emergency Services Implementation Strategy and Guideline I. PS/ES-5, which stipulates that an emergency response plan for Bidwell Park should be established. In addition, Public Safety and Emergency Services Implementation Strategy I. PS/ES-6 calls for information centers, safety and liability signage, and telephone service to be strategically located to reduce emergency response times within the Park. Upper Park Implementation Strategy and Guideline I. Upper-11 calls for the development of an emergency access plan for Upper Park.

The BPMMP and Park Improvement Projects would have a less than significant impact on emergency response and evacuation plans. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HAZ-7: RISKS TO PEOPLE OR STRUCTURES INVOLVING WILDLAND FIRES

The BPMMP calls for prescribed fire management as a tool to protect and enhance habitats (Prescribed Fire Objective O. PF-1). Prescribed Fire Implementation Strategy and Guideline I. PF-1 stipulates that the need for and location of prescribed burning and related vegetation management shall be determined to reduce catastrophic fire risk, and Prescribed Fire Implementation Strategy and Guideline I. PF-2 calls for the implementation of fire management guidelines contained in Section 5 of the NRMP (Appendix C to the BPMMP). Implementation of the fire management objectives and implementation strategies and guidelines contained in the BPMMP and Appendix C may have a beneficial effect on the threat of wildland fires. In addition, the BPMMP and Park Improvement Projects do not propose construction of residences in wildland fire areas.

The threat of wildland fires as a result of implementation of the BPMMP and the four Park Improvement Projects would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HAZ-8: CONFLICT WITH LOCAL POLICIES AND ORDINANCES

The BPMMP and four Park Implementation Projects have been developed consistent with local policies and ordinances pertaining to hazards and hazardous materials. Implementation of the BPMMP and the Park Improvement Plans therefore is not expected to result in any conflicts with local policies and ordinances.

Implementation of the BPMMP and the four Park Improvement Projects would not result in any conflicts with local policies and ordinances, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM HAZ-1

Bidwell Park does not include significant hazards or sources of hazardous materials that would pose a threat to people or the environment. Implementation of the BPMMP and the associated Park Improvement Projects is therefore not expected to result in potentially hazardous situation or exposure of people to hazardous substances. While implementation of Park Improvement Projects would require the use of some potentially hazardous materials such as chemicals and fuels, construction contractors will be required to use all materials in accordance to labeling requirements. Furthermore, a Storm Water Pollution Prevention Plan (SWPPP) will be required for any construction activity exceeding 0.5 acre in size. Implementation of the BMPs contained in the SWPPP will prevent the release of hazardous materials into the environment. These procedures, along with other potential impacts to water quality are discussed in Section E4.3.7, "Hydrology and Water Quality." Thus, implementation of the proposed project is not expected to result in cumulative impacts related to hazards and hazardous materials.

E4.3.7 HYDROLOGY AND WATER QUALITY

E4.3.7.1 ENVIRONMENTAL SETTING

Existing-conditions information on hydrology and water quality in Bidwell Park can be found in Section 2.3.1.3 of the BPMMP. Goals, Objectives, Implementation Strategies, and Guidelines pertaining to hydrology and water quality are located in the hydrology/water quality subsection of Section 3.5.3.1 of the BPMMP. Regulatory information pertaining to hydrology and water quality is included in the Regulatory Framework (Appendix I) and in the City of Chico General Plan Goals and Policies and Municipal Codes (Appendix J) appendices of the BPMMP.

E4.3.7.2 SIGNIFICANCE CRITERIA

An impact on hydrology and water quality resulting from implementation of a proposed project would be considered significant if it would:

- Substantially degrade water quality;
- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site;
- Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-or off-site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Place real property within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows; or

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami, or mudflow.

E4.3.7.3 METHODOLOGY

Potential impacts on hydrology and water quality resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines pertaining to hydrology and water quality and determining whether implementation of the BPMMP would result in potentially significant or significant effects based on the thresholds of significance listed above.

For the four Park Improvement Projects, the conceptual project plans were analyzed in terms of their potential impacts on hydrology and water quality, particularly where erosion is concerned. Whenever possible, potentially affected areas were quantified. Impacts analyzed include both direct impacts resulting from project implementation (BPMMP implementation or construction of the specific Park Improvement Projects) as well as indirect impacts that could result from altered use patterns of a certain area once the project is implemented. The analysis aims to identify both adverse and beneficial impacts.

E4.3.7.4 IMPACT DISCUSSION

IMPACT HYDRO-1: POTENTIAL FOR DEGRADATION OF WATER QUALITY

Impact HYDRO-1a: Potential for Water Quality Degradation with Implementation of the BPMMP

The BPMMP includes Goals, Objectives and Implementation Strategies and Guidelines that aim to protect, avoid, or minimize impacts related to water quality and waste discharge. Impacts on water quality in Bidwell Park are caused by erosion resulting from improper trail use and/or maintenance, the creation and use of informal trails (particularly in highly erodible areas), and from runoff from trails, roadways, and the golf course (pesticides, insecticides, etc.) that can result in sediments, oils, and heavy metals entering Big Chico Creek and its tributaries. The BPMMP also addresses water quality in terms of private and public use and for fish and terrestrial wildlife. The following is a summary of the Objectives and Implementing Strategies and Guidelines that apply to water quality issues:

- Implementation of Geology and Soils Objective O. G/S-1 would result in the periodic assessment of soil conservation and soil erosion potential to determine and modify protective measures. This objective also specifies that priority shall be assigned to high-use erodible and/or sensitive areas.

- Geology and Soils Objective O. G/S-3 calls for the conservation of shallow Park soils to the maximum extent feasible.

- Geology and Soils Objective O. G/S-4 addresses improperly designed roads, trails, and parking areas. It calls for these areas to be assessed periodically as potential sources of erosion, and for soil conservation measures to be applied based on the assessment.

- Reduction of soil erosion is also addressed in Geology and Soils Implementation Strategy and Guideline I. G/S-2. This implementation strategy stipulates that the City-approved Trails Manual be used for trail development and maintenance to reduce soil erosion.

- Geology and Soils Implementation Strategy and Guideline I. G/S-3 calls for the use of BMPs in the construction and maintenance of roads to minimize soil erosion and loss.

- Geology and Soils Implementation Strategy and Guideline I. G/S-5 stipulates that areas of active erosion be identified, and that methods be developed for controlling erosion and restoring active erosion sites.

- Geology and Soils Implementation Strategy and Guideline I. G/S-6 calls for the assessment of Park soils when planning and managing current and projected recreational opportunities.

- Trails Objective O. T-1 protects water quality by requiring trail maintenance to conform to acceptable standards specified in the Trail Manual.

- Trails Implementation Strategy and Guideline I. T-11 stipulates that the trail network in Bidwell Park be monitored regularly to identify areas with trail degradation.

- Patterns and Levels of Recreational Use Implementation Strategy and Guideline I. PRU-1 calls for soil conditions within the Park to be inspected and use levels and patterns identified periodically so that management and maintenance of specific sites and uses can be adjusted to minimize degradation of resources.

Implementation of these Objectives and Implementing Strategies would ensure that erosion and sedimentation would be less than is occurring under current conditions.

Where waste discharge is concerned, the BPMMP calls for permanent restrooms to replace year-round portable toilets in high-use areas. These restrooms would be connected to the City sewer system, as specified in Restroom Implementation Strategy and Guideline I. Rstrm-2. Restroom Implementation Strategy and Guideline I. Rstrm-3 stipulates that all restrooms shall be reviewed on a periodic basis.

Where water quality for human and wildlife resources use is concerned, Hydrology and Water Quality Objective O. H/WQ-1 calls for the preservation and enhancement of Big Chico Creek surface and groundwater quality, and Hydrology and Water Quality Objective O. H/WQ-7 strives to reduce point-source and nonpoint-source pollution in Big Chico Creek, and stipulates that additional stormwater outlets should not be permitted. Hydrology and

Water Quality Implementation Strategy and Guideline I. H/WQ-5 calls for development of measures to protect water quality in Big Chico Creek.

Compliance with BPMMP Goals and Objectives and Implementation Strategies and Guidelines would assist in reducing impacts and enhancing existing water quality considerations, including those pertaining to waste discharge and erosion. As a result, implementation of the BPMMP would not violate any water quality standards or waste discharge requirements, resulting in a less than significant impact. No mitigation is required.

Applies to: BPMMP

Impact HYDRO-1b: Potential for Water Quality Degradation with Implementation of the Four Park Improvement Projects

The Trails Plan calls for the maintenance of existing trails and discourages off-trail use. The Plan stipulates that trails in known erosion prone areas such at Monkey Face, the Jeep Trail, North Rim Trail, B Trail, and Bloody Pin Trail, should be maintained, upgraded, or rerouted. The Trails Plan prioritizes these problem areas for attention and funding. Several informal trails also exist in Bidwell Park; the Trails Plan calls for these to be either closed or established as official trails to be restored and maintained to applicable standards outlined in the Trails Manual.

Closure of existing informal trails as proposed under the Trails Plan may result in beneficial impacts on water quality, as highly erodible areas would no longer be accessible to hiking, biking, and horseback riding. However, restoration of existing trails, as well as construction of new trails, in Bidwell Park has the potential to violate water quality standards because construction activities could potentially expose and release sediment into Big Chico Creek and tributary waterways. Construction of new trails and upgrades existing trails to the standard specified in the Trails Manual also would result in beneficial impacts to water quality when compared with existing conditions.

The Horseshoe Lake Area Concept Plan proposes measures that have the potential to prevent future creation of informal trails, such as trail consolidation and upgrading, parking lot expansion, and installation of educational/ restoration-related signage. In addition, it proposes three types of edge treatments along the shores of Horseshoe Lake that would reduce the potential for erosion: a boulder edge, a wetlands edge, and a gravel edge. The concept plan also includes parking lot expansions, including restrooms that are a part of the City sewer system and additional trails which could result in impacts on water quality during construction.

The Cedar Grove Area Concept Plan calls for the construction of a paved parking lot, several new trail segments, and an information/orientation plaza. Construction of these facilities could have similar temporary adverse effects on water quality.

The Disc Golf/Trailhead Area Concept Plan identifies areas of thin erodible soil as high priority for impact minimization. It also identifies areas slated for restoration, including portions of the short course that have been damaged by intensive use. The Plan recommends protecting areas located outside of disc golf tees and targets and associated trails by cementing tees to prevent them from expanding, which may also lessen expanded compaction of the soil around the tees. Redesign of the existing unmitigated disc golf course would also include (depending upon the selected alternative) construction of new tees, shortening or lengthening of existing tees, replacement of existing tees, and construction of new connecting trails, a parking lot, interpretive facilities, picnic benches and a scenic overlook which could result in impacts on water quality during construction.

For all four of the Park Improvement Projects, upgrades planned to existing trails and recreation areas, and construction of new facilities have the potential to adversely affect water quality through temporary construction activities and through the introduction of impervious surfaces for parking lots, road improvements, ADA-compliant trails, and restrooms.

Adverse effects on water quality from project construction and the introduction of impervious surfaces would be a potentially significant impact requiring mitigation.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Mitigation Measure HYDRO-1b: Comply with Water Quality Standards and Waste Discharge Requirements

When required, the City shall obtain a General Permit for Discharges of Storm Water associated with Construction Activity (Construction General Permit), which pertains to water pollution resulting from project construction. In compliance with permit requirements, the City shall file a Notice of Intent (NOI) with the State Water Resources Control Board (SWRCB) and prepare a Storm Water Pollution Prevention Plan (SWPPP) before commencement of construction activities. The SWPPP will incorporate BMPs to prevent, or reduce to the greatest extent feasible, adverse effects on water quality from erosion and sedimentation. In addition, all new trails shall be designed, constructed, and maintained per the City's Trails Manual.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/ Trailhead Area Concept Plan

Timing/Implementation: Before commencement of construction activities

Responsible Party: City of Chico

Implementation of Mitigation Measure HYDRO-1b would reduce potentially significant water quality impacts from implementation of Park Improvement Projects to a less than significant level.

IMPACT HYDRO-2: CHANGES IN GROUNDWATER LEVELS

The BPMMP does not contain goals, objectives, or implementation strategies and guidelines that would result in substantial depletion of groundwater supplies or interfere with groundwater recharge, including the introduction of large impermeable surfaces to the Park. No new uses that rely on additional groundwater are proposed as part of the BPMMP or the four Park Improvement Projects. Air Quality Implementation Strategy and Guideline I. AQ-2 does mention alternatives to unpaved roads and parking areas, but these areas are not large enough to be considered significant for recharge purposes. In addition, Facilities Implementation Strategy and Guideline I. F-2 calls for the use of materials that have the least adverse effect and greatest benefit on the environment in the future development of facilities within Bidwell Park.

The Trails Plan calls for upgrades of existing trails to standards specified in the Trails Manual, decommissioning of existing informal trails, and in some cases the creation of new trails. As previously mentioned, it also notes that any and all new and/or altered trail facilities shall comply with the ADA. However, none of these activities have the potential to substantially affect groundwater supplies or recharge.

Implementation of the Horseshoe Lake Area Concept Plan would result in the expansion of impermeable surfaces in the Horseshoe Lake area through the expansion of Parking Lots B, C, and E, and through the installation of restrooms and picnic areas. However, the areas of increased impermeable surface are limited, particularly in relation to the expanse of permeable surfaces in the area of Horseshoe Lake.

The Cedar Grove Area Concept Plan calls for the installation of three paved parking lots (one for 40 vehicles, one for 49 vehicles, and an overflow parking lot for 48 vehicles), which would increase impermeable surfaces in the Cedar Grove area. However, the area that would be paved is limited, so project construction would result in only a small increase in impermeable surface relative to the entire Cedar Grove area.

Implementation of the Disc Golf/Trailhead Area Concept Plan calls for the creation of cement tees, a picnic area and parking lot, a scenic overlook, and restroom facilities, which would increase impermeable surfaces in the Disc Golf/Trailhead area. However, the areas of increased impermeable surface are limited, particularly in relation to the expanse of permeable surfaces in the area of the Disc Golf/Trailhead area.

Implementation of the BPMMP as well as the four Park Improvement Plans would result in less than significant impacts related to groundwater supplies and recharge. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HYDRO-3: CHANGES IN EXISTING DRAINAGE PATTERN, AND INCREASED RISK OF FLOODING AND ADDITIONAL POLLUTED RUNOFF FROM INCREASED STORMWATER RUNOFF

Implementation of Goals, Objectives, and Implementation Strategies and Guidelines contained within the BPMMP would not result in changes to existing drainage patterns, nor would it introduce substantial amounts of impermeable surfaces or impediments to stream flow, thus causing and increased risk of flooding. The Air Quality section of the BPMMP calls for implementation of dust pollution control measures through Parking Implementation Measure and Guideline I. Parking-3, which recommends the consideration of asphalt and alternative parking materials and treatments for large parking lots. Use of such materials and treatments would introduce impermeable surfaces where currently there are none. However, the potential introduction of these impermeable surfaces would be small relative to the amount of permeable surfaces existing in Bidwell Park. Surface-water runoff, including that polluted with oils and heavy metals, would be minimal, and would be directed toward newer existing storm drains. Implementation of the BPMMP therefore would have only a minimal impact on the City's stormwater drainage system.

Improvements to existing trails as specified by the Trails Plan such as trail construction, trail realignment, and trail closure would not significantly increase impermeable surfaces within the Park, nor would they contribute significant amounts to increased runoff or significantly alter existing drainage patterns. Implementation of ADA-compliant trails has the potential to slightly increase surface runoff by introducing impermeable surfaces where there is none. However, exceptions to ADA compliance for new/altered trails are made for the protection of natural resources, and where compliance would not be feasible because of steep terrain. Adherence to BMPs contained in the City's Trail Manual and site analysis proposed in the Trails Plan would ensure that trail construction, improvement, or closure would not increase the amount of stormwater runoff, or pollution contained within the runoff. Because implementation of the Trails Plan would also involve upgrades of existing trails to standards specified in the Trails Manual, and because all new trails would be constructed to these standards, and because the Trails Plan calls for the closure and rehabilitation on informal trails and upgrades/redesign for trails in know problem areas, implementation of the Trails Plan would be expected to reduce current problems related to drainage and stormwater runoff when compared with existing conditions.

The implementation of improvements contained in the Horseshoe Lake Area Concept Plan, such as expanded parking areas, addition of restrooms, and installation of picnic areas, would increase the amount of impermeable surfaces at Horseshoe Lake, which could potentially result in increased surface runoff. However, these improvements would be constructed in compliance with federal, state, and local regulations regarding stormwater

runoff, including the City's adopted Storm Drainage Master Plan (2000). Proposed improvements in the Horseshoe Lake Area Concept Plan also include three types of lake edge treatments intended to reduce potential erosion while providing safe access to the lake's shores. Where access is desired, a boulder edge condition is proposed. The proposed wetlands edge would create wildlife habitat and separate the perimeter trail from the lake edge. The proposed gravel edge is similar to the current lake edge condition and would allow users direct access to the water. Regardless of edge type selected, the Horseshoe Lake Area Concept Plan proposes planting of additional native trees, shrubs, and grasses. None of these proposed improvement and subsequent visitor activities would substantially alter existing drainage patterns, nor would they contribute to increased erosion.

Improvements contained in the Cedar Grove Area Concept Plan include the construction of paved parking areas, which would increase the amount of impermeable surfaces in the Cedar Grove area. However, implementation of the Cedar Grove Area Concept Plan would not result in a significant amount of additional impermeable surfaces, relative to the amount of permeable surface at the site. In addition, any construction would adhere to federal, state, and local regulations regarding stormwater runoff, including the City's adopted Storm Drainage Master Plan (2000).

Construction of improved fairways and tees, realignment of existing fairways and tees, and the closure of existing fairways and tees as well as the construction of the parking lot, trails, scenic overlook and other improvement proposed under the Disc Golf/Trailhead Area Concept Plan are not expected to substantially alter drainage patterns or increase impermeable surfaces at the disc golf site. In addition, any construction would adhere to federal, state, and local regulations regarding stormwater runoff. Individual projects will be designed and constructed in accordance with the City's adopted Storm Drainage Master Plan to address potential drainage issues. Improvement of fairways and tees may result in beneficial impact to site hydrology, such as reduction of erosion and sedimentation impacts on Big Chico Creek, as these improvements would reduce the overall area of the disc golf course footprint by more clearly aligning trails, tees and targets.

Impacts of the BPMMP and Park Improvement Projects related to existing drainage patterns, increased surface runoff and stormwater drainage capacity and additional polluted runoff would be less than significant.
No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HYDRO-4: LOCATION OF STRUCTURES WITHIN A 100-YEAR FLOOD HAZARD AREA AND RESULTING REDIRECTION OF FLOOD FLOWS

The Goals, Objectives, and Implementation Strategies and Guidelines contained within the BPMMP will not result in the placement of any structures within the 100-year flood hazard area within the Park. Facilities

Objective O. F-3 stipulates that facilities in the Park should be located, designed, and constructed to avoid and minimize adverse environmental effects, and Facilities Implementation Strategy and Guideline I. F-1 states that facilities should be planned, sited, and developed based on accepted uses for specific areas of the Park, environmental sensitivities, compatible recreation interests, educational interests, safety, and other factors. Restroom Objective O. Rstrm-1 provides restrooms adjacent to high-use areas and other locations as needed, such as trailheads.

The Trails Plan does call for the construction of a new bridge in Upper Park. However, the Plan does not include the construction of any other permanent structures or any residential structures within the Park.

Implementation of the Horseshoe Lake Area Concept Plan includes the construction of a restroom at Parking Lot B. However, the Plan does not include the construction of any other permanent structures or any residential structures within the Park.

The Cedar Grove Area Concept Plan includes construction of an information/orientation plaza, as well as information signs, regulatory signs, and seating areas at the entry plaza. However, the Plan does not include the construction of any other permanent real property or any residential structures within the Park.

The Disc Golf/Trailhead Area Concept Plan includes construction of a restroom facility, picnic area, parking lot, and information and regulatory signs. However, is does not include the construction of any permanent real property or residential structures. Furthermore, the Disc Golf/Trailhead Concept Plan site is located well above the 100-year floodplain of Big Chico Creek.

It should be noted, in relation to flooding, that Big Chico Creek is a free-flowing stream down to Five-Mile Dam in Bidwell Park. At Five-Mile Dam, Big Chico Creek's flow during higher flows is partially diverted into Lindo Channel (historically known as Sandy Gulch). Lindo Channel is an ephemeral stream that formed as a natural channel on the Chico alluvial fan, but was historically modified for flood control purposes in the early 1960s. Lindo Channel runs parallel to Big Chico Creek for almost 8 miles before rejoining the creek about 2 1/2 miles from Big Chico Creek's confluence with the Sacramento River. Lindo Channel is still used today as a diversion channel to relieve flood flows in Big Chico Creek. The construction of the Lindo Channel and Sycamore Creek Diversions and their use as flood control facilities has removed any threat of serious flooding from Big Chico Creek to the City of Chico. Minor flooding does occur annually during heavy rains at Annie's Glen, which is a low-lying area along Vallombrosa Avenue, downstream of the Mangrove Bridge. The slight flooding that occurs has not affected city streets or bridges, and only the picnic area receives floodwaters.

In addition, the City of Chico General Plan provides protection for structures exposed to 100-year flood hazards. Any project that is subject to flooding must comply with the City requirement that states that either the project

must demonstrate adequate flood protection for structures, or meet a determination by the City that no increase in flood hazard will occur based on a capacity analysis. The BPMMP and the four Park Improvement Projects would comply with these flood protection measures.

Implementation of the four Park Improvement Plans, as well as the overall BPMMP, would result in less than significant impacts related to redirection of flood flows within a 100-year flood hazard area. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf Area Concept Plan

IMPACT HYDRO-5: EXPOSURE OF PEOPLE OR STRUCTURES TO A SIGNIFICANT RISK OF FLOODING AS A RESULT OF THE FAILURE OF A LEVEE OR DAM

Implementation of the BPMMP and the four Park Improvement Projects would not expose people or structures to significant risks involving flooding. Please see the discussion above regarding Lindo Channel's ability to reduce the risk of flooding along Big Chico Creek during high-water events. In addition, Public Services and Emergency Services Objective O. PS/ES-3 in the BPMMP stipulates that appropriate locations for safety and liability signage be determined, and Public Safety and Emergency Services Implementation Strategy I. PS/ES-5 calls for the establishment of an Emergency Response Plan. There are no dams located upstream of Five-Mile Dam. In addition, Upper Park is closed to the public during high-water events.

Implementation of the four Park Improvement Plans, as well as the overall BPMMP, would result in less than significant impacts related to flooding risks from levee or dam failure. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HYDRO-6: EXPOSURE OF PEOPLE OR STRUCTURES TO A SIGNIFICANT RISK OF INUNDATION BY SEICHE, TSUNAMI, OR MUDFLOW

Bidwell Park is located too far inland to be inundated by any foreseeable tsunami. The nearest impoundment capable of failure during a seiche is Shasta Dam, approximately 80 miles northwest of Chico. Shasta Dam is sufficiently distant from Bidwell Park to allow ample advance warning and evacuation of Park users present so that no loss of life would occur. Because of the lack of appreciable soils on steep slopes in Bidwell Park, a mudflow is not anticipated, even during storm events.

Implementation of the four Park Improvement Plans, as well as the overall BPMMP, would result in less than significant impacts related to exposure to inundation risks from seiche, tsunami, or mudflow. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT HYDRO-7: CONSISTENCY WITH LOCAL POLICIES AND ORDINANCES

The BPMMP and four Park Improvement Projects have been developed consistent with local policies and ordinances pertaining to the protection of hydrology and water quality. Implementation of the BPMMP and the Park Improvement Plans therefore is not expected to result in any conflicts with local policies and ordinances.

Implementation of the four Park Improvement Plans, as well as the overall BPMMP, would result in no impact related to consistency with local policies and ordinances. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM HYDRO-1

Implementation of the BPMMP and the four associated Park Improvement Projects is not expected to result in adverse effects on water quality and hydrology in the Park. Construction of the four Park Improvement Projects has the potential to result in short term increases in stormwater runoff and would add a minor amount of impervious surfaces. However, the City would file a Notice of Intent with the State Water Resources Control Board to seek coverage under the General Permit for construction activities and require construction contractors to implement a Storm Water Pollution Prevention Plan (SWPPP). All Park Improvement Projects would be designed and implemented in compliance with the City's Drainage Master Plan. The BPMMP and Park Improvement projects would not result in adverse effects on groundwater levels, changes in drainage patterns, or increase the risk of flooding or expose of people to high risk situation related to flooding. The projects also would not create runoff that would exceed the City's capacity for stormwater or place structures within a 100-year floodplain. The BPMMP and four Park Improvement Projects are consistent with local policies and ordinances. Thus, implementation of the proposed projects is not expected to result in cumulative impacts on local and regional hydrology and water quality.

E4.3.8 LAND USE AND PLANNING

E4.3.8.1 ENVIRONMENTAL SETTING

Information about the local and regional land use planning context for Bidwell Park can be found in Section 2.2 of the BPMMP. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to land use and planning are located in Sections 3.5.2.1 through 3.5.2.3 of the BPMMP. In addition, Appendix J of the BPMMP contains relevant Goals and Policies from the City of Chico General Plan (1999) and a summary of pertinent portions of the City of Chico Municipal Code.

E4.3.8.2 SIGNIFICANCE CRITERIA

An impact on land use and planning resulting from implementation of a proposed project would be considered significant if it would:

- Be inconsistent with general plan or specific plan policies, or zoning regulations;
- Physically divide an established community;
- Conflict with any applicable resource management or resource conservation plan;
- Result in substantial conflict with the established character, aesthetics, or functioning of the surrounding community;
- Be a part of a larger project involving a series of cumulative actions;
- Result in displacement of people or business activity; or
- Convert viable prime agricultural land and/or land under agricultural contract to nonagricultural use, or substantially conflict with existing agricultural operations. (Viable agricultural land is defined as land on Class I or Class II agricultural soils of 5 acres or greater, adjacent to existing urban development on no more than one side.)

E4.3.8.3 METHODOLOGY

Potential impacts related to land use and planning resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementing strategies and guidelines pertaining to land use and planning and determining whether implementation of the BPMMP would result in potentially significant effects on or inconsistencies with the local and regional land use and planning framework. Potential impacts resulting from the specific Park Improvement Projects in turn were examined for their consistency with the land use and planning concepts of the overall BPMMP. Potential impacts consist of direct impacts resulting from project implementation

and indirect impacts that could result from altered use patterns that may result in effects on land use and planning in the immediate vicinity of the Park.

E4.3.8.4 IMPACT DISCUSSION

IMPACT LU-1: INCONSISTENCY WITH LOCAL POLICIES, ZONING REGULATIONS, OR RESOURCE MANAGEMENT OR RESOURCE CONSERVATION PLANS

Bidwell Park is located within the planning area of the City of Chico's General Plan (City of Chico 1999b). The broad purpose of the General Plan is to express the policies that will guide the City's decisions on future growth, development, and resource protection. Specific plans, area plans, zonings, subdivisions, local agency projects, and other local land use decisions must be consistent with the Chico General Plan. The City of Chico General Plan sets the policy direction for land use in Bidwell Park and acknowledges the BPMMP as the more refined guidance document for management of the Park. The BPMMP represents the applicable resource management plan for Bidwell Park.

Bidwell Park is designated *Parks* in the Land Use element of the General Plan. In addition, nearly the entire park is identified as a Resource Conservation Area (RCA). RCAs are designated to recognize the presence of sensitive and valuable habitat requiring protection and conservation in perpetuity, including seasonal and permanent wetlands, riparian woodlands, valley oak woodlands, riverine habitats, areas known to support special status species, and areas known to serve as important wildlife movement corridors. Application of the RCA designation varies considerably within Bidwell Park as it covers the more intensively developed locations near downtown as well as the more remote reaches of Upper Park. The General Plan requires the preparation of a long-term comprehensive planning program for RCAs to ensure the long-term viability of these areas. The BPMMP and its associated Environmental Impact Report implement this General Plan requirement for Bidwell Park by inventorying sensitive resources and establishing comprehensive resource management policies and programs for all areas of the Park. Consistent with the General Plan, these resource management policies and programs are balanced with policies pertaining to providing various recreational opportunities throughout the Park.

The General Plan elements most relevant to the BPMMP Update include the Community Design; Land Use; Parks, Public Facilities, and Services; Open Space and Environmental Conservation; and the Safety and Safety Services elements. The Community Design element addresses the importance of the creek corridors to the identity of the City and establishes policies that protect the creeks as natural resources while providing enhanced opportunities for views and access. The Land Use element establishes land use designations within the City, which detail the types and intensities of permissible uses and special classifications.

The Parks, Public Facilities, and Services element specifically addresses current and future needs of Bidwell Park, establishing City policy to provide recreation opportunities at a variety of scales for all residents and to protect

views, open space, and sensitive resources while expanding Upper Bidwell Park. The Open Space and Environmental Conservation element expresses the policies that comprise the City's approach to managing and conserving various natural resources including air quality, biological resources, cultural resources, water resources, open space, soils, and geology. In the Safety and Safety Services element, policies are expressed that address wild land fires, fire safety and law enforcement. The Chico General Plan and Municipal Code include many policies that apply to Bidwell Park. Due to the large number of policies and codes, they are included as Appendix J of this document.

Bidwell Park is zoned *OS-1* (*primary open space*) in Title 19 (Land Use and Development Regulations) of the Chico Municipal Code, which is consistent with the *Parks* General Plan land use designation. While the *OS-1* zoning classification identifies the types of land uses generally considered appropriate for parks and open space areas on a city-wide basis, the BPMMP's recognized as the detailed planning document for Bidwell Park, specifying allowable uses by area and establishing a set of management practices to follow.

Aside from the General Plan, two other plans have guided the provision of park and recreation facilities in the City of Chico: the 1988 Park and Recreation Plan, a CARD document, and the 1990 Bidwell Park Master Management Plan (BPMMP), adopted by the City Council and the Bidwell Park and Playground Commission (BPPC).

The Bidwell Park Master Management Plan adopted in 1990 includes park-wide goals, objectives, and design standards, as well as recommendations for each of 32 management zones. The BPMMP Update document comprises a comprehensive update of the 1990 Bidwell Park Master Management Plan. Goals, objectives, design standards, and management recommendations were updated to reflect current conditions. Management zones were combined to make the document more user friendly and easier to understand. Furthermore, this BPMMP Update includes a variety of technical Appendices including Annie Bidwell's Deed (Appendix A), a Visitor and Community Survey Summary (Appendix B), a Natural Resources Management Plan (NRMP) (Appendix C), and an annotated outline for a Cultural Resources Management Plan (Appendix D). Also included are a Trails Plan (Appendix E in the BPMMP), and site specific concept plans for the Horseshoe Lake and Cedar Grove areas, and the proposed Disc Golf Facility/Trailhead at the SR 32 site (Appendices F, G, and H). Information on the overall regulatory context pertaining to BPMMP implementation and relevant City of Chico Policies are included in Appendices I and J, respectively. Appendix K (confidential) includes a cultural resources inventory, Appendix L contains updated design standards, and Appendix M includes the City of Chico Bench Policy. Appendix N has been established as a depository of future written guidance from the BPPC on interpretation of the BPMMP.

The City of Chico and Butte County General Plan land use elements govern land uses in and around the Park. Lower Park is adjacent to urban, residential, and commercial land found within the City of Chico, as well as the

California State University at Chico (CSUC). Middle Park is surrounded by undeveloped ranch land to the north and residential zoning to the south. Upper Park is surrounded by various properties including the Brown Ranch to the north, the State-owned Big Chico Creek Ecological Reserve to the east and several private parcels including the Canyon Oaks residential development and SR 32 to the south.

The BPMMP and associated Park Improvement Projects have been developed consistent with the General Plan and Municipal Code and no zoning changes are proposed. In addition, Objective O. MC-1 specifically calls for the management of Bidwell Park consistent with the BPMMP, General Plan, and Municipal Code. Objective O. MC-2 calls for the establishment of resource or management zone designations to help guide the type and extent of resource protection and/or allowable uses for specific Park locations, where appropriate. This objective aims to further refine site-specific management.

Implementation of the BPMMP and the four Park Improvement Projects would not result in conflicts with local policies or zoning regulations, or with any applicable resource management plan; no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-2: PHYSICAL DIVISION OF AN ESTABLISHED COMMUNITY OR CHANGES TO THE SURROUNDING COMMUNITY

Implementation of the BPMMP and associated Park Improvement Projects would not result in any changes of Park boundaries or the physical relationship of the Park to its surroundings, the community of Chico, or rural Butte County. Because any proposed changes and improvements would affect only the Park, implementation of the BPMMP and Park Improvement Projects would not result in changes in the character, aesthetics, or functioning of the surrounding community. Furthermore, the BPMMP and specific Park Improvement Projects aim to better accommodate the current and projected future uses of the Park.

Implementation of the BPMMP and Park Improvement Projects would not physically divide the Park, nor would it change the Park's relationship to surrounding communities or change the character of those communities; no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-3: CONFLICT WITH ANY APPLICABLE RESOURCE MANAGEMENT OR RESOURCE CONSERVATION PLAN

The BPMMP is the specific resource management plan for Bidwell Park. The Park Improvement Projects have been designed consistent with the BPMMP. No other resource management or resource conservation plans apply to the management of Park lands.

Implementation of the BPMMP and associated Park Improvement Projects therefore would not result in conflict with other applicable plans and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-4: RESULT IN SUBSTANTIAL CONFLICT WITH THE ESTABLISHED CHARACTER, AESTHETICS, OR FUNCTIONING OF THE SURROUNDING COMMUNITY

Implementation of the BPMMP and associated Park Improvement Project will not adversely affect the established character, aesthetics of functioning of the surrounding community, because the Park will continue to be managed and used consistent with current land uses. No impact will occur and no mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-5: INCLUSION IN A LARGER PROJECT INVOLVING A SERIES OF CUMULATIVE ACTIONS

Implementation of the Park Improvement Projects is part of BPMMP implementation. However, implementation of both the BPMMP and the Park Improvement Projects is not expected to result in any cumulative actions/changes on land use, as all aspects of the BPMMP and the Park Improvement Projects have been developed in the context of and consistent with local and regional land use planning and zoning regulations.

Implementation of the BPMMP and the four Park Improvement Projects would result in no impact with regard to larger projects and cumulative actions. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-6: DISPLACEMENT OF PEOPLE OR BUSINESS ACTIVITY

Implementation of the BPMMP and Park Improvement Projects would not result in the displacement of people or business activities, as no changes to the current use of the Park are proposed. Implementation of the Park

Improvement Projects is not expected to result in displacement of business activity, as proposed changes would not result in off-site effects on local businesses.

No people or businesses would be displaced with implementation of the BPMMP and the four Park Improvement Projects, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT LU-7: CONVERSION OF AGRICULTURAL LAND TO NONAGRICULTURAL USE, OR CONFLICTS WITH EXISTING AGRICULTURAL OPERATIONS

As discussed above under Section E4.2.1, "Agricultural Resources," the Park does not include areas designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on maps prepared under the Farmland Mapping and Monitoring Program, and it does not include lands under Williamson Act contracts. Implementation of the BPMMP and Park Improvement Projects is not expected to conflict with existing agricultural operations in the vicinity of the Park.

Implementation of the BPMMP and the four Park Improvement Projects would result in no impact on agricultural lands or operations. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT CUM LU-1

The BPMMP and specific Park Improvement Projects have been developed in the context of and consistent with local and regional land use planning and zoning regulations. No adverse effects on local plans or the existing character of the communities will occur and no land use conversions are proposed. Thus, the proposed project is not expected to result in cumulative impacts on land uses in the region.

E4.3.9 NOISE

E4.3.9.1 ENVIRONMENTAL SETTING

The following discussion of existing conditions constitutes a summary of conditions specifically relevant to the impacts and mitigation measures that follow.

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration, and as any pressure variation in air that the human ear can detect.

Sound Properties

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal chords, the string, and sound board of a guitar or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium. Regardless of the type of source creating the sound wave, the particles of the medium through which the sound moves are vibrating in a back and forth motion at a given frequency (pitch).
The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium.
The frequency of a wave is measured as the number of complete back-and-forth vibrations of a particle per unit of time. If a particle of air undergoes 1,000 longitudinal vibrations in 2 seconds, then the frequency of the wave would be 500 vibrations per second. A commonly used unit for frequency is cycles per second, called hertz (Hz).

Each particle vibrates as a result of the motion of its nearest neighbor. For example, the first particle of the medium begins vibrating at 500 Hz and sets the second particle of the medium into motion at the same frequency (500 Hz). The second particle begins vibrating at 500 Hz and sets the third particle into motion at 500 Hz.
The process continues throughout the medium; each particle vibrates at the same frequency, which is the frequency of the original source. Subsequently, a guitar string vibrating at 500 Hz will set the air particles in the room vibrating at the same frequency (500 Hz), which carries a sound signal to the ear of a listener that is detected as a 500 Hz sound wave.

The back-and-forth vibration motion of the particles of the medium would not be the only observable phenomenon occurring at a given frequency. Because a sound wave is a pressure wave, a detector could be used to detect oscillations in pressure from high to low and back to high pressure. As the compression (high-pressure) and rarefaction (low-pressure) disturbances move through the medium, they would reach the detector at a given frequency. For example, a compression would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Similarly, a rarefaction would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Thus, the frequency of a sound wave refers not only to the number of back-and-forth

vibrations of the particles per unit of time but also to the number of compression or rarefaction disturbances that pass a given point per unit of time. A detector could be used to detect the frequency of these pressure oscillations over a given period of time. The period of the sound wave can be found by measuring the time between successive high-pressure points (corresponding to the compressions) or the time between successive low-pressure points (corresponding to the rarefactions). The frequency is simply the reciprocal of the period; thus an inverse relationship exists so that as frequency increases, the period decreases, and vice versa.

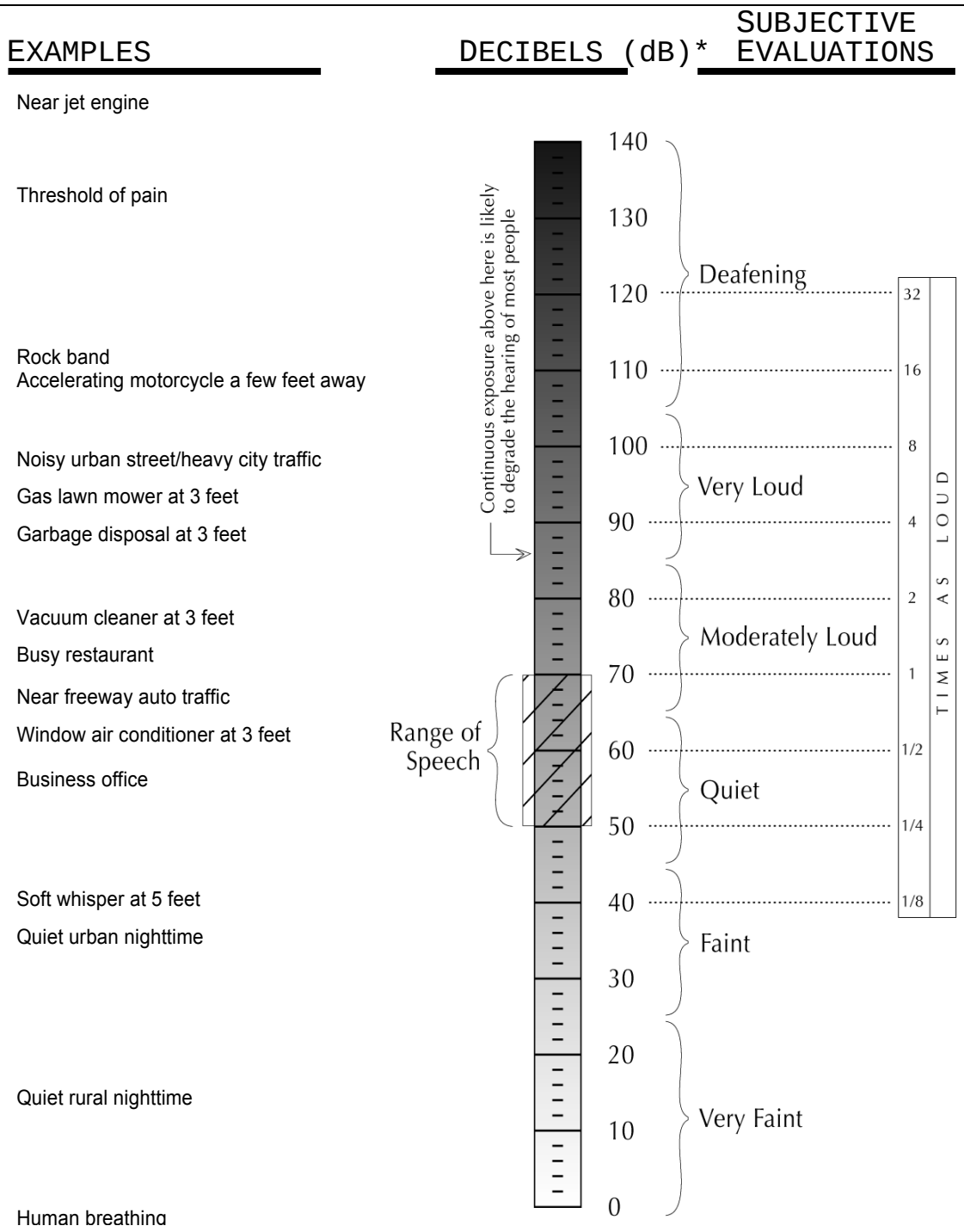
A wave is an energy transport phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by high amplitude; a low-energy wave is characterized by low amplitude. The amplitude of a wave refers to the maximum amount of displacement of a particle from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the amplitude of a wave is indicative of a quadrupling of the energy transported by the wave.

Sound and the Human Ear

Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold (Caltrans 1998). Use of this logarithmic scale reveals that the total sound from two individual 65- A-weighted dB (dBA) sources is 68 dBA, not 130 dBA (i.e., doubling the source strength increases the sound pressure by 3 dBA).

Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. A dBA scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most authorities for the purpose of regulating environmental noise. Typical indoor and outdoor noise levels are presented in Exhibit E4.3.9-1.

With respect to how humans perceive and react to changes in noise levels, a 1 dBA increase is imperceptible, a 3 dBA increase is barely perceptible, a 6 dBA increase is clearly noticeable, and a 10 dBA increase is subjectively perceived as approximately twice as loud (Egan 1988), as presented in Table E4.3.9-1. Table E4.3.9-1 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of



* dB are "average" values as measured on the A-scale of a sound-level meter.
From *Concepts in Architectural Acoustics* (M. David Egan, McGraw Hill 1988) and *The Noise Guidebook* (U.S. Department of Housing and Urban Development, Office of Community Planning and Development, undated).

Source: EDAW 2006

Typical Noise Levels **Exhibit E4.3.9-1**

Table E4.3.9-1 Subjective Reaction to Changes in Noise Levels of Similar Sources		
Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or Half) as Loud	10.0
Source: Egan 1988		

50 to 70 dBA, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dBA or more is typically considered significant and/or substantial in terms of the degradation of the existing noise environment.

Sound Propagation

As sound (noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, is dependent on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance (dBA/DD). However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA/DD. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Atmospheric conditions such as wind speed, temperature, and humidity may affect noise levels. The presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation is dependent upon the size of the barrier and the frequency of the noise. A noise barrier may be any natural or human-made feature such as a hill, tree, building, wall, or berm (Caltrans 1998).

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dBA with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2002).

Noise Descriptors

The selection of a proper noise descriptor for a specific source is dependent upon the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Caltrans 1998, Lipscomb and Taylor 1978).

- L_{max} (Maximum Noise Level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."
- L_{min} (Minimum Noise Level): The minimum instantaneous noise level during a specific period of time.
- L_X (Statistical Descriptor): The noise level exceeded X% of a specific period of time.
- L_{eq} (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high work levels.
- L_{dn} (Day-Night Noise Level): The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- CNEL (Community Noise Equivalent Level): The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.
- SENL (Single Event [Impulsive] Noise Level): The SENL describes a receiver's cumulative noise exposure from a single impulsive noise event, which is defined as an acoustical event of short duration and involves a change in sound pressure above some reference value. SENLs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level L_{eq}, which corresponds to a steady-state A-weighted

sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 1998).

Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structureborne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS), as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Federal Highway Administration [FHWA] 1995, Caltrans 2002).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is

often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FHWA 1995). This is based on a reference value of 1 micro (µ) in/sec.

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FHWA 1995).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FHWA 1995).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table E4.3.9-2 describes the general human response to different levels of groundborne vibration-velocity levels.

Table E4.3.9-2
Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

VdB = vibration decibels referenced to 1 µ inch/second and based on the root mean square (RMS) velocity amplitude.
Source: FHWA 1995

Existing Noise Environment

Existing Noise-Sensitive Land Uses

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior

noise levels. Other noise-sensitive land uses include schools, hospitals, convalescent facilities, parks, hotels, places of worship, libraries, and other uses where low interior noise levels are essential.

Bidwell Park extends from downtown Chico into the surrounding foothills of the Sierra Nevada/Cascade Range. While existing land uses surrounding Lower Park include residential and commercial development, the surrounding land uses of Middle Park include residential uses on the south side and open space on the North site and the surrounding land uses of Upper Park include mainly open space.

Existing Noise Sources

The existing noise environment within Bidwell Park is influenced primarily by surface transportation noise emanating from vehicle traffic on area roadways. Noise from surrounding residences and businesses as well as noise from the use of Lower Park facilities including Sycamore Pool and other One Mile Recreation Area facilities, Caper Acres playground, Cedar Grove Picnic Area, Chico Creek Nature Center, and trail users contribute to the existing noise environment of Lower Park. Middle Park includes several Park attractions and centers of visitor activity such as the Hooker Oak Recreation Area, the equestrian Center, the Kiwanis Community Observatory, the Municipal Golf Course, and Horseshoe Lake and users of these facilities contribute to the noise environment of Middle Park. Upper Park is mainly used by recreational users, including hikers, bikers, and equestrians. In addition, disc golf is played at the Highway 32 site.

Roadway Vehicle Traffic

One of the dominant noise sources in Bidwell Park is vehicle traffic on Highway 99, SR 32, and local roadways including Vallombrosa Avenue, Woodland Avenue, Petersen Memorial Drive, South Park Drive, East 8th Street, Manzanita Avenue, Centennial Way, Wildwood Avenue, and Upper Park Road.

Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

There are no federal plans, policies, regulations, or laws related to noise that are applicable to the proposed project.

State Plans, Policies, Regulations, and Laws

Title 24 of the California Code of Regulations (CCR) establishes standards governing interior noise levels that apply to all new single family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum L_{dn} levels to 45 dBA in any habitable room. Although there are no generally applicable interior noise standards pertinent to all

uses, many communities in California have adopted an L_{dn} of 45 as an upper limit on interior noise in all residential units.

In addition, the State of California General Plan Guidelines (State of California 2003), published by the state Governor's Office of Planning and Research (OPR), provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. Table E4.3.9-3 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. Generally, residential uses are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA CNEL/L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55 to 70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA CNEL and normally unacceptable in areas exceeding 70 dBA CNEL. Commercial uses are normally acceptable in areas up to 70 dBA CNEL. Between 67.5 and 77.5 dBA CNEL, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table E4.3.9-3
Maximum Allowable Noise Exposure Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn} /CNEL, dB	Leq, dB[2]
Residential	60[3]	45	--
Transient Lodging	60[4]	45	
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Hall	--	--	35
Churches, Meeting Halls	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	60[3]	--	45
Playgrounds, Neighborhood Parks	70	--	--

1 Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

2 As determined for a typical worst-case hour during periods of use.

3 Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been L_{dn} implemented and interior noise levels are in compliance with this table.

4 In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

Source: Chico General Plan 1994

Local Plans, Policies, Regulations, and Laws

City of Chico General Plan Policies

- **N-I-1.** New development of noise-sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table E4.3.9-3, unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table E4.3.9-3.

  Noise created by new transportation noise sources should be mitigated so as not to exceed the levels specified in Table E4.3.9-3 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.

- **N-I-2.** It is anticipated that roadway improvement projects will be needed to accommodate buildout of the general plan. Therefore, existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects as a result of increased roadway capacity, increases in travel speeds, etc. It may not be practical to reduce increased traffic noise levels consistent with those contained in Table E4.3.9-3. Therefore, as an alternative, the following criteria may be used as a test of significance for the environmental review of a roadway improvement project:

  - Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant; and
  - Where existing traffic noise levels range between 60 and 65 dB L_{dn} outdoor activity areas of noise sensitive uses, a +3 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant; and
  - Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise sensitive uses, a +1.5 dB L_{dn} increase in noise levels due to a roadway improvement project will be considered significant.

  Note: Roadway improvement projects can result in increased travel speeds and/or an increase in roadway capacity. An analysis of noise impacts associated with a roadway improvement project should evaluate the projected future traffic volumes, speeds, traffic distribution and truck mix with and without the project. Therefore, the changes in traffic speeds and traffic volumes along those roadways which are attributed solely to the roadway project will be evaluated with respect to the above-mentioned criteria.

  Noise-sensitive land uses are generally considered to include residential, hotel/motel, schools, libraries, churches, hospitals and nursing homes. Outdoor activity areas are considered to be the portion of the parcel where outdoor activities generally occur (i.e., patios of residences and outdoor instructional areas of schools).

- **N-I-7.** In making a determination of impact for a new project, under the CEQA, consider the following changes in noise levels for determining a test of "significance."

- For transportation noise sources, the criteria contained within Implementing Policy N-I-2 shall be used to determine a significant impact.

- For non-transportation noise sources, where existing background noise levels at the receiving land use are determined to be less than the performance criteria contained within Table E4.3.9-4, a 4 dB increase in noise levels due to the project shall be used to determine a significant impact. However, noise sources due to the project shall not be allowed to produce noise levels in excess of the performance standards contained within Table E4.3.9-4.

Table E4.3.9-4
Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Sources

Noise Level Descriptor	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq}, dB	55	45
Maximum level, dB	75	65

Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

Note: For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

Source: Chico General Plan 1994

For non-transportation noise sources, where background noise levels at the receiving land use are determined to exceed the performance standards contained in Table E4.3.9-4, noise sources due to the project will be allowed to produce noise levels at the receiving use consistent with the performance standards contained within Table E4.3.9-4. In addition, the project will be allowed to produce noise levels in excess of the performance standards contained within Table E4.3.9-4, as long as they do not contribute to an increase in the overall background noise levels.

City of Chico Municipal Code

Section 9.39.030 Residential Property Noise Limit

A No person shall produce, suffer or allow to be produced by human voice, machine, animal, or device or any combination if same, on residential property, a noise level at any point outside of the property plane that

exceeds, at any point outside the property plan, seventy (70) dBA between the hours of 7:00 a.m. and 9:00 p.m. or sixty (60) dBA between the hours of 9:00 p.m. and 7:00 a.m.

B No person shall produce, suffer or allow to be produced by human voice, machine, animal, or devices, or any combination of the same, on multifamily residential property, a noise level more that sixty (60) dBA three feet from any wall, floor, or ceiling inside any dwelling unit on the same property, when the windows or doors of the dwelling unit are closed, except within the dwelling unit n which the noise sources may be located.

Section 9.38.060

B Construction and Alteration of Structures. Notwithstanding any other provision of this chapter, between the hours of 10:00 a.m. and 6:00 p.m. on Sundays and holiday, and 7:00 a.m. and 9:00 p.m. on other days, construction, alteration or repair of structures shall be subject to one of the following limits:

1. No individual device or piece of equipment shall produce a noise level exceeding eighty three (83) dBA at a distance of twenty-five (25) feet from the source. If the devise or equipment is house within a structure of the property, the measurement shall be made outside the structure at a distance as close as possible to twenty-five (25) feet from the equipment.

2. The noise level at any point outside the property plane of the project shall not exceed eighty-six (86) dBA.

E4.3.9.2 SIGNIFICANCE CRITERIA

A noise impact resulting from implementation of a proposed project would be considered significant if it would result in:

- Exposure of residents in new hotels, motels, apartment houses, and dwellings (other than single-family dwellings) to interior noise levels (CNEL) higher than 45 dBA in any habitable room with windows closed; or exposure of sensitive receptors (residential, parks, hospitals, schools) to exterior noise levels of 60 dBA L or higher;

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

- For a project located within the airport land use plan or in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

E4.3.9.3 METHODOLOGY

Potential impacts related to noise resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines and determining whether implementation of the BPMMP would result in potentially significant or significant effects.

For the four Park Improvement Projects, actions that would be implemented under each of the conceptual project plans were considered in relationship to existing noise levels in the project areas and by calculating the noise levels that would occur based on the types of equipment that would be used during construction. In order to calculate construction noise levels, the four projects were assumed to be built one after the other. While this scenario is highly unlikely, as implementation of the Park Improvement Projects depends on funding and projects will be implemented over time as funds become available, this scenario was chosen for analysis purposes to provide the worst case scenario.

E4.3.9.4 IMPACT DISCUSSION

IMPACT NOISE-1: EXPOSURE OF SENSITIVE RECEPTORS TO EXCESSIVE NOISE LEVELS FROM PROJECT CONSTRUCTION

Impact NOISE-1a: Exposure of Sensitive Receptors from Implementation of BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term. Implementation of the BPMMP itself does not include any construction related projects or any project aspects that would result in changes to current noise levels.

Implementation of the BPMMP will not result in the exposure of residents to noise levels in excess of applicable standards, and there would be no impact. No mitigation is required.

Applies to: BPMMP

Impact NOISE-1b: Exposure of Sensitive Receptors from Implementation of Park Improvement Projects

On-site Construction Equipment

If all four Park Improvement Projects were constructed sequentially, construction could occur over a approximately 14-month period. Construction related activities could include site preparation (e.g., staging, excavation, grading, demolition, and clearing), material transport, construction of related-support structures, and

other miscellaneous activities. Specific construction equipment that would be required for the improvements is not known at this time, but could likely include earth-moving equipment including scrapers, dozers, loaders, graders, excavators, paving equipment, and trucks. According to the U.S. Environmental Protection Agency, noise levels for individual equipment can range from 79 to 91 dBA at 50 feet, as indicated in Table E4.3.9-5.

The simultaneous operation of on-site construction equipment associated with the project, as identified above, could result in combined intermittent noise levels up to approximately 91 dBA at 50 feet from the site with no feasible noise control devices installed or no attenuation from intervening barriers or vegetation. Based on these equipment noise levels and a typical noise-attenuation rate of 6 dBA per doubling of distance, exterior noise levels at noise-sensitive receptors located within 100 feet from the construction activities could exceed 85 dBA without feasible noise controls.

Table E4.3.9-5
Typical Equipment Noise Levels

Type of Equipment	Noise Level in dBA at 50 feet	
	Without Feasible Noise Control	With Feasible Noise Control[1]
Scraper	88	80
Dozer	80	75
Loader	79	75
Excavator	88	80
Backhoe	85	75
Grader	85	75
Truck	91	75

[1] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers' specifications.

Sources: U.S. Environmental Protection Agency 1971

Most of the Disc Golf/Trailhead Concept Plan Area, the Horseshoe Lake area, and most segments of the Trails Plan to be constructed are located well beyond 100 feet from any permanent sensitive receptors. One residence is found in the vicinity of the Disc Golf/Trailhead Concept Plan Area, and residences are located in close vicinity to the Cedar Grove Concept Plan Area. For these areas, the City of Chico Noise ordinance would apply.

According to the City of Chico Noise Ordinance (Section 9.38.060), as stated above in the regulatory setting, noise from construction operations which occurs within the hours of 7:00 a.m. and 9:00 p.m. Monday through Saturday, and from 10:00 a.m. and 6:00 p.m. Sundays and holidays, is limited to 86 dBA at any point outside a project boundary. If construction were to occur during the more noise-sensitive hours (e.g., 9:00 p.m. through 7:00 a.m. Monday through Saturday, or from 6:00 p.m. to 10:00 a.m. on Sundays and holidays) or construction equipment is not properly equipped with noise control devices, construction-generated source noise could result in

annoyance and/or sleep disruption to occupants of any existing noise-sensitive land uses in the project vicinity and create a substantial temporary increase in ambient noise levels.

As a result, noise impacts associated with construction in the Cedar Grove Concept Area and near the residence adjacent to the Disc Golf/Trailhead area is considered potentially significant. Implementation of the following mitigation measures would reduce this impact to a less than significant level.

Mitigation Measure Noise-1: Construction Related Noise

The following measures shall be implemented to mitigate for construction noise control associated with the Park Improvement Projects:

- Construction equipment shall be properly maintained and equipped with noise control, such as mufflers, in accordance with manufacturers' specifications
- Construction activities shall be limited to the hours of 7:00 a.m.–9:00 p.m., Monday through Saturday, and to 10:00 a.m.–6:00 p.m. on Sundays and holidays.
- Construction equipment shall be arranged to minimize travel adjacent to occupied residences and turned off during prolonged periods of non-use.

Applies to: Cedar Grove Concept Plan, Disc Golf Area Concept Plan, future Park Improvement projects near sensitive receptors

Timing/Implementation: During construction of Park Improvement Projects

Responsible Party: City of Chico

Off-site Construction Traffic

As described in the methods section above, a worst case scenario was assumed for construction traffic. Construction of the proposed project would require approximately 10 on-site employees at any given time. Assuming two total trips per day per employee and five roundtrips per day associated with the transport of equipment and materials, project construction would result in a maximum of approximately 30 one-way daily trips. Typically, traffic volumes have to double before the associated increase in noise levels is noticeable [3 dBA ($CNEL/L_{dn}$)] along roadways. Therefore, the addition of these daily trips on the local roadway system to existing volumes would be minor. Consequently, construction of the project would not result in a noticeable change in the traffic noise contours of area roadways. In addition, such increases in traffic would be temporary and occur during the less noise-sensitive daytime hours. Thus, short-term off-site construction traffic source noise would not result

in the exposure of persons to or generation of noise levels in excess of applicable standards or create a substantial temporary increase in ambient noise levels in the project vicinity.

As a result, this impact is considered less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT NOISE-2: EXPOSURE OF SENSITIVE RECEPTORS TO EXCESSIVE NOISE LEVELS FROM PROJECT OPERATION

Impact NOISE 2a: Exposure of Sensitive Receptors to Excessive Noise Levels from Project Operation of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term. Implementation of the BPMMP itself does not include any operational noise related projects or any project aspects that would result in changes to current noise levels.

Implementation of the BPMMP will not result in the exposure of residents to noise levels in excess of applicable standards, and there would be no impact. No mitigation is required.

Applies to: BPMMP

Impact NOISE-2b: Exposure of Sensitive Receptors to Excessive Noise Levels from Project Operation of the Park Improvement Projects

On-site Equipment

Long-term operation of the four proposed Park Improvement Projects would not result in the operation of any new noise-generating stationary equipment. In addition, area source noise associated with landscaping and maintenance activities would take place at the same level as without the project. Thus, long-term on-site stationary- and area-source noise would not result in the exposure of persons to or generation of noise levels in excess of applicable standards or create a substantial permanent increase in ambient noise levels in the project vicinity.

Off-site Operational Traffic

Long-term operation of the proposed project would not require significant additional employees. Therefore, only minor additional daily trips would be added to the local roadway system; consequently, operation of the project would not result in a noticeable change in the traffic noise contours of area roadways. In addition, it is anticipated that potential users of the Park Improvement Projects would consist predominantly of existing users, resulting in

negligible additional trip generation from recreational users. Thus, long-term off-site operational traffic source noise would not result in the exposure of persons to or generation of noise levels in excess of applicable standards or create a substantial permanent increase in ambient noise levels in the project vicinity.

As a result, implementation of the four Park Improvement Projects would not result in the exposure of persons to or generation of excessive noise levels. This impact would be considered less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT NOISE-3: EXPOSURE OF PERSONS TO OR GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OF GROUNDBORNE NOISE LEVELS

Impact Noise-3a: Exposure to Vibration of the BPMMP

The BPMMP is a policy document aimed at providing guidance for the management of Bidwell Park in the long term. Implementation of the BPMMP itself does not include any vibration-generating projects or any project aspects that would result in exposure of receptors to groundborne vibration.

Implementation of the BPMMP will not result in the exposure of residents to vibration levels in excess of applicable standards, and there would be no impact. No mitigation is required.

Applies to: BPMMP

Impact Noise-3b: Exposure to Vibration of the Park Improvement Projects

Construction activities have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table E4.3.9-6 displays vibration levels for typical construction equipment.

Table E4.3.9-6
Typical Construction-Equipment Vibration Levels

Equipment	PPV at 25 feet (in/sec)1	Approximate Lv at 25 feet2
Large Bulldozer	0.089	87
Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Notes: in/sec = inches per second; Lv = velocity level in decibels (VdB) referenced to 1 microinch per second (µin/sec) and based on the root mean square (RMS) velocity amplitude; PPV = peak particle velocity
Source: Federal Transit Administration 2006

As discussed above, specific on-site construction equipment needed for the four Park Improvement projects is not known at this time, but would be expected to include dozers, trucks, loaders, paving equipment, excavators, and graders. According to the Federal Transit Administration (FTA) and as shown in Table E4.3.9-6, vibration levels associated with the use of large bulldozers are 0.089 in/sec PPV and 87 VdB (referenced to 1 μin/sec and based on the RMS velocity amplitude) at 25 feet. Using FTA's recommended procedure for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels of approximately 0.01 in/sec PPV and 81 VdB at the closest existing noise-sensitive receptor to construction operations (approximately 100 feet away) could occur from use of large dozers during construction near sensitive receptors such as in the Cedar Grove area. These vibration levels would not exceed Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2002) with respect to the prevention of structural damage for normal buildings and FTA's maximum-acceptable vibration standard of 75 VdB (Federal Transit Administration 2006) with respect to human annoyance for residential uses. In addition, the long-term operation of the proposed project (i.e., use and maintenance of the proposed trails, disc golf course, and other facilities) would not include any vibration sources.

Implementation of the four Park Improvement Projects would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. As a result, this impact is considered less than significant. No mitigation is required.

Applies to: Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/ Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT NOISE CUM-1

Noise impacts resulting from implementation of the BPMMP and the four specific Park Improvement projects are minor. Only short term construction noise in areas near sensitive receptors would be potentially significant and require mitigation as outlined above. Impacts resulting from on-site construction traffic and project operation are less than significant. The projects would not expose persons to or generate excessive amounts of vibration or ground born noise level. The noise impacts resulting from the proposed projects are temporary and would not add to a cumulative considerable noise impact over time. Thus, the proposed project is not expected to result in cumulative impacts to the local or regional noise environment.

E4.3.10 PUBLIC SERVICES

E4.3.10.1 ENVIRONMENTAL SETTING

Existing conditions information regarding public services available in Bidwell Park can be found in Section 2.4.6 (Public Safety and Emergency Services) and Section 2.5 (Operations and Maintenance Staff) of the BPMMP. Objectives, Implementation Strategies and Guidelines pertaining to public services are located in Section 3.5.4.7 (Public Safety and Emergency Services) and Section 3.5.5 (Maintenance and Operations) of the BPMMP. Section 5 of the NRMP found in Appendix C of the BPMMP provides information on fire as a management tool for fuel control and natural resource management.

E4.3.10.2 SIGNIFICANCE CRITERIA

An impact on public services resulting from implementation of a proposed project would be considered significant if it would have a substantial adverse effect upon or result in a need for altered governmental services in any of the following areas:

- Fire protection;
- Police protection;
- Schools,
- Parks and recreation facilities;
- Maintenance of public facilities, including road, canals, etc.;
- Other government services.

E4.3.10.3 METHODOLOGY

Potential impacts related to public services resulting from implementation of the BPMMP and the four Park Improvement Projects were analyzed by considering whether these projects would potentially result in significant changes to public services currently available in and around the Park.

E4.3.10.4 IMPACT DISCUSSION

IMPACT PS-1: FIRE PROTECTION

Fire protection in Bidwell Park is provided by the City of Chico Fire Department, with the Butte County Fire Department and California Department of Forestry (CDF) also providing response for the more remote areas of the Park under mutual aid agreements. CDF also operates an Air Attack Base Station on property leased from the Chico Municipal Airport. The risk of wildlife in Bidwell Park, and especially in Upper Park is generally considered high. Implementation of the Disc Golf/Trailhead Area Concept Plan will provide additional facilities in an area of the Park that is considered extremely fire prone. The potential impacts of increased risk of wildfire

are addressed in Section 4.3.6.4 (Hazards and Hazardous Materials) of the BPMMP, which shows that all potential hazards and hazardous material impacts, based on Appendix G of the State CEQA Guidelines, would be less than significant. Implementation of the BPMMP or the four Park Improvement Projects would not extend the service area of the City's fire department, nor would the projects necessitate construction of new fire protection facilities or the alternation of existing facilities. In fact, the new creek crossing in Upper Park would provide enhanced access for wildfire fighting capability.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact on fire protection services in the City or the region. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT PS-2: POLICE PROTECTION

Security Services for Bidwell Park are provided by the City of Chico Police Department and Park Rangers. Implementation of the BPMMP and the four Park Improvement Projects is not expected to result in a significant increase in the need for police response, nor would it necessitate the construction of new police protection facilities or the alternation of existing facilities.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact on police protection services in the City and the region. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT PS-3: SCHOOLS

The BPMMP is a master plan that provides a long term management framework for Bidwell Park. The four Park Improvement Projects present upgrades to exiting facilities and creation of new facilities to enhance the recreational experience in the Park, while preserving sensitive biological, cultural, aesthetic, and other resources. Neither the BPMMP, nor the four Park Improvement Projects include any residential uses, nor would they increase the number of residents in the area, which would in turn increase the number of students or requirements for construction of new school facilities.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact to schools. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT PS-4: PARKS

Both the BPMMP and the four Park Improvement Projects aim at improving the management of the Park and to enhance the enjoyment of the people using the Park while preserving the many important resources it contains. None of the proposed projects would add residences to the project area that could result in increased demand for additional city or county parks or contain any components that would lead to increased demand on other parks in the City or region.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact to other City and regional parks. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT PS-5: MAINTENANCE OF PUBLIC FACILITIES, INCLUDING ROADS, CANALS, ETC

Implementation of the BPMMP would not result in an increased need for the maintenance of public facilities. The four Park Improvement Projects, once implemented, will provide additional public facilities such as trails, parking areas, a play structure, restrooms, picnic tables, interpretive kiosks, benches, trash receptacles etc. which will need to be maintained on order to function properly. However, implementation of any of the four Park Improvement Projects would not move forward until adequate funding for construction and maintenance of the projects has been secured. This would include adequate funding for staff to maintain the upgraded and new facilities.

Implementation of the BPMMP and the four Park Improvement Projects would have a less than significant impact to the maintenance of public facilities. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT PS-6: OTHER PUBLIC FACILITIES

Implementation of the BPMMP and the four Park Improvement Projects is expected to enhance the use of the Park, to provide upgrades and enhancements to facilities that are already available in the Park, and to provide a some additional public facilities such as additional parking, picnic areas, interpretive kiosks and signage, new bridges, scenic viewpoints, and an official disc golf facility. The projects are not expected to have any adverse

effects on offsite public facilities or result in the need for any other new or expanded public services elsewhere in the City of the region.

Implementation of the BPMMP and the four Park Improvement Projects would have no impact on other public facilities. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT PS CUM-1

Implementation of the BPMMP and the four Park Improvement Projects would result in no impacts of fire protection, police protection, schools, Park, or other public facilities and less than significant impacts on the maintenance of public facilities. Thus, the proposed project is not expected to result in cumulative impacts on local or regional public services.

E4.3.11 RECREATION

E4.3.11.1 ENVIRONMENTAL SETTING

Information pertaining to recreation in Bidwell Park can be found in Section 2.3.6 of the BPMMP. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to recreation are located in Section 3.5.3.6 of the BPMMP. In addition, the Trails Plan (Appendix E of the BPMMP), Horseshoe Lake Area Concept Plan (Appendix F of the BPMMP), Cedar Grove Area Concept Plan (Appendix G of the BPMMP) and Disc Golf/ Trailhead Area Concept Plan (Appendix H of the BPMMP) contain detailed maps depicting existing and proposed trails and other facilities aimed at improving the recreational experience of Park users. The updated Design Standards (Appendix L of the BPMMP) provide guidance of the desired look of future facilities that may be constructed in the Park.

E4.3.11.2 SIGNIFICANCE CRITERIA

An impact on recreation resulting from implementation of a proposed project would be considered significant if it would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

E4.3.11.3 METHODOLOGY

Potential impacts to recreation resulting from implementation of the BPMMP were analyzed by reviewing the goals, objective, and implementing strategies and guidelines pertaining to recreation and determining whether implementation of the BPMMP would result in potentially significant effects. Potential impacts resulting from the four Specific Park Improvement Projects were examined for their potential of effect on neighborhood and regional parks and physical effects on the environment resulting from construction of expansion of facilities.

E4.3.11.4 IMPACT DISCUSSION

IMPACT REC-1: POTENTIAL FOR INCREASE IN USE OF LOCAL AND REGIONAL RECREATIONAL FACILITIES RESULTING IN DETERIORATION OF THE FACILITIES

Implementation of the BPMMP and the four Park Improvement Projects would result in improved management and upgrades of recreational facilities in Bidwell Park. The projects are not intended to increase overall use of the Park or attract more visitors to the Park. They are designed to better manage existing uses, facilitate circulation,

reduce user conflict, and abate resource degradation. As such, implementation of the project would not result in adverse effects on the recreational facilities in the Park. Implementation of the project likewise would not result in an increase in use of other local and regional parks, because the BPMMP and Concept Plans do not include any components that would result in a displacement of existing Park uses.

Implementation of the BPMMP and Park Improvement Projects would result no impact with regards to an increase in the use of local and regional recreational facilities. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT REC-2: CONSTRUCTION OR EXPANSION OF RECREATIONAL FACILITIES WITH ADVERSE PHYSICAL EFFECT ON THE ENVIRONMENT

Implementation of the BPMMP and the four Park Improvement Projects would result in the redesign and upgrade of existing facilities in the Park, as well as in the construction of additional picnic areas, scenic overviews, signage, and restrooms. The BPMMP contains multiple goals and guidelines aimed at resource protection, as well as design standards for upgrades to existing and construction of new facilities. This EIR describes and analyzes the effects of implementation of the proposed Park Improvement Projects concept plans on the environment. Where potentially significant impacts have been identified for a particular resource area, mitigation measures to reduce these impacts to less than significant levels are provided. In addition, the Disc Golf/Trailhead Area Concept Plan has been specifically designed to avoid or minimize resource damage and, therefore, when compared with existing conditions, which have resulted in a degradation of resources on the site due to unmitigated use, would result in a beneficial effect on the environment. The Trails Plan and Horseshoe Lake Area Concept Plan likewise contain elements intended to reduce ongoing resource damage, such as consolidation of trails, closure and restoration of informal trails, realignment of trails in problem areas, upgrade of trails to standards provided in the City's Trails Manual, and delineation of parking. Therefore, implementation of the BPMMP and Park Improvement Projects, in coordination with the mitigation measures identified for the various resource topics in this EIR, would not cause adverse effects on the physical environment resulting from the construction of new recreational facilities.

Implementation of the BPMMP and Park Improvement Projects would result in less than significant effects on the environment resulting from the construction or expansion of recreational facilities. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT REC CUM-1

Implementation of the BPMMP and the four Park Improvement Projects would result in no impacts with potential for increase in use of local and regional recreational facilities and in less than significant impacts with regards to damage to the environment from construction or expansion of recreational facilities. Thus, the proposed project is not expected to result in cumulative impacts to local or regional recreational facilities.

E4.3.12 TRANSPORTATION AND TRAFFIC

E4.3.12.1 ENVIRONMENTAL SETTING

Information on circulation and parking within Bidwell Park and access to the Park can be found in Section 2.4.3 of the BPMMP. Circulation Elements are depicted in Exhibits 2.4.3-1a through 2.4.3-1c. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to circulation and access are located in Section 3.5.4.3 of the BPMMP. In addition, the Trails Plan (Appendix E of the BPMMP) contains detailed maps that depict existing and proposed trails throughout the Park. Proposed parking lot expansions and trail improvements are depicted in the Trails Plan (Appendix E), Horseshoe Lake Area Concept Plan (Appendix F), Cedar Grove Area Concept Plan (Appendix G) and Disc Golf/Trailhead Area Concept Plan (Appendix H). Traffic count data collected for two locations in the Park during preparation of the BPMMP are included in Appendix E6.

E4.3.12.2 SIGNIFICANCE CRITERIA

An impact on traffic and circulation resulting from implementation of a proposed project would be considered significant if it would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
- Result in a substantial impact on existing or proposed public-transit systems, including rail and air traffic;
- Result in effects on existing parking facilities or demand for new parking not provided for by the project;
- Result in an increase in circulation hazards to motor vehicles, bicycles, or pedestrian, equestrian, or other traffic;
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation.

E4.3.12.3 METHODOLOGY

Potential impacts on traffic and circulation resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines pertaining to traffic and circulation and determining whether implementation of the BPMMP would result in potentially significant effects on or inconsistencies with regional and local traffic and circulation plans. Potential impacts resulting from the four Park Improvement Projects were examined for their consistency with local traffic and circulation planning concepts

and the overall BPMMP. Potential impacts consist of direct impacts resulting from project implementation and indirect impacts that could result from altered traffic patterns in the immediate vicinity of the Park.

E4.3.12.4 IMPACT DISCUSSION

IMPACT TRAFFIC-1: POTENTIAL FOR INCREASE IN TRAFFIC LEVELS

Circulation and Access Objective O. C/A-3 of the BPMMP calls for restricting the development of new north-south roadways that would bisect Bidwell Park in favor of improving existing north-south roadways within the Park. No new roads would be constructed with implementation of the BPMMP or any of the Park Improvement Projects, and none of the improvements planned under the Park Improvement Projects represent new facilities that would result in a substantial increase in the number of visitors to the Park. The proposed Disc Golf/Trailhead Concept Plan, like the other Park Improvement Projects, is intended to accommodate an existing use. However, implementation of this Concept Plan calls for the development of a new trailhead providing access to destinations in Upper Park, and development of an enhanced, mitigated, and City-sanctioned disc golf course, both of which could serve as a draw to new users. Vehicle trips generated by new users are not intended to be significant, would be spread out over the course of a day, and would not result in a reduction of the level of service along this stretch of SR 32.

Issues related to safe ingress and egress to and from the Disc Golf/Trailhead site would require review by Caltrans, including the issuance of an encroachment permit, which would ensure that adequate lines of sight and that acceleration and deceleration lanes, if necessary, were properly engineered (see Mitigation Measure TRAFFIC-1).

All four Park Improvement Projects contain elements that seek to improve the existing parking or the addition of new parking. However, these improvements aim to accommodate current levels of Park use and to better regulate parking to reduce resource damage. In addition, the BPMMP includes several implementation strategies and guidelines that seek to promote non-motorized use of the Park. Specifically, Circulation and Access Guideline I. C/A-1 calls for the Park to be connected to the city via a bicycle pathway system, where appropriate. Circulation and Access Guideline I. C/A-3 calls for the evaluation of Park access corridors from surrounding neighborhoods and city-wide to determine potential improvements, including multiple types of access. Circulation and Access Guideline I. C/A-13 specifically encourages car pooling during special events to limit the number of vehicles in the Park. As a result of all these specific measures contained in the BPMMP and the overall purpose of the Park Improvement Projects to accommodate current use levels, traffic levels in the Park and in the City are not expected to increase compared with existing conditions as a result of implementation of the BPMMP or the Park Improvement Projects.

Implementation of the BPMMP and Park Improvement Projects would not result in an increase in traffic levels in the Park, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT TRAFFIC-2: POTENTIAL FOR ADVERSE EFFECTS ON THE LOCAL TRANSIT SYSTEM

Implementation of the BPMMP and the four Park Improvement Projects is not expected to have an adverse effect on the local transit system. The BPMMP contains several objectives that seek to enhance the use of the local transit system by Park users. Specifically, Circulation and Access Objective O. C/A-1 calls for the provision of multi-modal accessibility to the Park and within the Park, and Circulation and Access Objective O. C/A-6 calls for the encouragement to establish additional bus routes and access by public transportation to the Park. If implemented, these objectives would contribute to an enhanced transit system in the Park and City. Circulation and Access Implementation Strategies and Guidelines include I. C/A-1, which calls for the connection of Park bicycle routes to the citywide pathway system, where appropriate. I. C/A-3 calls for the evaluation of Park access corridors from surrounding neighborhoods and citywide to determine if/where improvements could be made, including multiple types of access and appropriate locations. I. C/A-4 calls for using existing city streets beyond Park boundaries for motor vehicle circulation. I. C/A-9 calls for the Park to be closed to motor vehicles at night, with the hours set by the City, except in approved night use areas. I. C/A-12 calls for providing access points to the Park for nonmotorized uses with appropriate sight distance for safe entry. I. C/A-13 calls for encouraging carpooling to reduce the number of vehicles in the Park. None of the four specific Park Improvement Projects contains any component expected to put an increased burden on the local transit system, because they are not designed to increase the use of any specific area. Instead, they are intended to accommodate and manage the uses that already occur. The Horseshoe Lake Area in Middle Park and the Disc Golf/Trailhead Area in Upper Park are not currently served by the local transit system, so any changes to these facilities therefore would not affect local transit systems.

Implementation of the BPMMP and Park Improvement Plans would not adversely affect the local transit system, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT TRAFFIC-3: EFFECTS ON EXISTING PARKING OR DEMAND FOR NEW PARKING

The BPMMP contains several elements that improve the parking situation in the Park. Objective O-Parking-1. of the BPMMP calls for the use of centralized parking at appropriate locations and the design of parking areas to

avoid user conflict. Objectives O.- Parking-2 through O.-Parking-4 call for the minimization of parking in inappropriate areas, minimization of adverse effect of parking on resources during special event, and the delineation of parking lots to minimize resources damage. Implementation Strategies and Guidelines for parking include: I. Parking-1, which calls for identifying and periodically reviewing the usage intensity of existing parking lots; I. Parking-4 calls for improvements to parking for access to Upper Park on the South Side; I. Parking-5 calls for considering the uses of satellite carpooling facilities; and I. Parking-6 calls for clearly identifying carpooling areas.

Design Standard 2 in Appendix L of the BPMMP shows a typical parking lot delineation recommended for clarifying parking patterns and minimizing resource damage. Implementation of the Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, and Disc Golf/Trailhead Area Concept Plan would result in an increase in the number of parking spaces available to Park visitors, at each of these specific locations, thus resulting in and improved parking situation during high demand times. Provision of these improved parking facilities would result in an overall positive effect on existing parking, as it would eliminate the need to park along roadsides, off shoulders, and within natural areas during high use time.

Implementation of the BPMMP and Park Improvement Projects would not result in adverse effects on existing parking or in the demand for new parking and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT TRAFFIC-4: INCREASE IN CIRCULATION HAZARDS TO MOTOR VEHICLES, BICYCLES, PEDESTRIAN, EQUESTRIAN OR OTHER TRAFFIC

Impact Traffic-4a: Increase in Circulation Hazard with Implementation of the BPMMP

The BPMMP is a policy document and as such would not result in any changes to the physical environment. Implementation of the BPMMP would have no impact on circulation hazards in the Park. No mitigation is required.

Applies to: BPMMP

Impact Traffic-4b: Increase in Circulation Hazards with Implementation of the Four Park Improvement Projects

Implementation of the Trails Plan calls for the installation of a bridge in Upper Park to provide improved access and safe crossing. All four Park Improvement Projects contain trail elements that are aimed at improved

circulation and reducing user conflict; therefore, implementation of the Concept Plans could potentially lead to a decrease in circulation hazards.

Access to the Disc Golf/Trailhead Area Concept Plan site requires a left turn off of eastbound SR 32 into the proposed parking lot. Extensive sight distance is available for the proposed access point. An encroachment permit from Caltrans would be required for construction of the access and parking lot portions of the Concept Plan, as the plan occupies a portion of an existing Caltrans Right-of-Way. With implementation of the Disc Golf/Trailhead Area Concept Plan, the area would become an official destination in Upper Park as a trailhead and for disc golf. This could result in a potential increase in circulation hazards to motor vehicles traveling westbound along SR 32.

Implementation of the Disc Golf/Trailhead Area Concept Plan could result in impacts on local traffic through an increase in circulation hazards to Park users at the Disc Golf/Trailhead Area project site. This would be a potentially significant impact subject to mitigation.

Applies to: Disc Golf/Trailhead Area Concept Plan

Mitigation Measure Traffic-4: Coordinate with Caltrans

To address the potential increase in traffic hazards resulting from implementation of the Disc Golf/Trailhead Area Concept Plan, the City shall coordinate with Caltrans to obtain an encroachment permit for construction of the site access and parking lot for the Disc Golf/Trailhead area. As part of the consultation with Caltrans, the City shall address the potential need for additional signage and/or a left turning lane to address traffic safety along SR 32. The City shall implement any measures deemed necessary by Caltrans as a condition of the encroachment permit or as a result of the consultation on safety.

***Applies to*:** Disc Golf/Trailhead Area Concept Plan

Timing/Implementation: Prior to construction of the Disc Golf/Trailhead Area Concept Plan

Responsible Party: City of Chico

Implementation of Mitigation Measure Traffic-1 would reduce potentially significant impacts on traffic safety resulting from implementation of the Disc Golf/Trailhead Area Concept Plan to a less than significant level.

IMPACT TRAFFIC-5: POTENTIAL FOR INADEQUATE EMERGENCY ACCESS

The BPMMP contains several elements addressing the need for adequate emergency access in Bidwell Park. Specifically, BPMMP Public Safety and Emergency Access Implementation Strategy I. PS/ES-5 stipulates that an emergency response plan for Bidwell Park should be established, and Upper Park Implementation Strategy I.

Upper-11 calls for the development of an emergency access plan for Upper Park, helping to ensure the continued adequacy of emergency access. As described in Impact TRAFFIC-1 above, implementation of the BPMMP and Park Improvement Projects is not expected result in an increase in traffic levels in the Park. In addition, no facilities would be constructed that would require increased access to the Park by emergency vehicles. Safe access to the Disc Golf/Trailhead Area would be addressed as part of the consultation with Caltrans and the implementation of any additional measures deemed necessary to provide access as discussed under Mitigation Measure Traffic-1 above. The construction of a bridge in Upper Park will provide improved access for both park visitors and emergency responders. Therefore, implementation of the BPMMP and the four Park Improvement Projects is not expected to result in the potential for inadequate emergency access.

Impacts of the BPMMP and Park Improvement Projects on emergency access to the Park would be less than significant. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT TRAFFIC-6: CONFLICT WITH LOCAL POLICIES SUPPORTING ALTERNATIVE TRANSPORTATION

The BPMMP and Park Improvement Projects have been developed consistent with local policies and ordinances pertaining to alternative transportation. Implementation of the BPMMP and the Park Improvement Projects therefore is not expected to result in any conflicts with local policies and ordinances.

Implementation of the BPMMP and the four Park Improvement Projects would not result in any conflicts with local policies regarding alternative transportation, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT TRAFFIC CUM-1

Implementation of the BPMMP and the four Park Improvement Projects will not result in an increase in traffic levels in the Park, adversely affect the local transit system or have an adverse effect on existing parking or in an increased demand for new parking. With regards to increase in circulation hazards at the Disc Golf/Trailhead area, coordination with Caltrans will be required. Implementation of the Trails Plan will result in enhance emergency access. Thus, the proposed projects are not expected to result in cumulative impacts on local and regional traffic and circulation patterns.

E4.3.13 UTILITIES AND SERVICE SYSTEMS

E4.3.13.1 ENVIRONMENTAL SETTING

Information on utilities and service systems within Bidwell Park can be found in Section 2.4.5 of the BPMMP. Goals, Objectives, and Implementation Strategies and Guidelines pertaining to utilities and service systems are located in Section 3.5.4.6 of the BPMMP.

E4.3.13.2 SIGNIFICANCE CRITERIA

An impact on utilities and service systems resulting from implementation of a proposed project would be considered significant if it would:

- Result in a substantial alteration in the availability of water for domestic use and fire protection, or availability of natural gas, telephone, or other communication services;
- Exceed wastewater treatment requirements of the applicable regional water quality control board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements;
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand, in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid-waste disposal needs; or
- Fail to comply with local statutes and regulations related to solid waste.

E4.3.13.3 METHODOLOGY

Potential impacts on utilities and service systems resulting from implementation of the BPMMP were analyzed by reviewing the goals, objectives, and implementation strategies and guidelines pertaining to utilities and service systems and determining whether implementation of the BPMMP would result in potentially significant effects.

Potential impacts resulting from each of the four Park Improvement Projects were examined by analyzing their potential effects on local utilities and service systems.

E4.3.13.4 IMPACT DISCUSSION

IMPACT UTIL-1: DECREASED AVAILABILITY OF WATER, NATURAL GAS, OR TELEPHONE SERVICE OR OTHER COMMUNICATION SERVICES

Neither the BPMMP nor the four Park Improvement Projects contain any elements that would affect the supply of water or availability of natural gas in the Park or surrounding areas. Telephone Service Objective O. TS-1 of the BPMMP calls for telephone service in the Park, and Internet and Cell Phone Objective O. I/CP-1 calls for the consideration of Internet and cell phone access for some areas of the Park. The Implementation Strategies and Guidelines I. TS-1 through I. TS-3 call for analyzing the existing public telephone locations and increasing their availability as funding allows, as well as providing and expanding emergency telephones. I. I/CP-1 calls for enhancing cell phone coverage and prioritizing opportunities for emergency calls. If implemented, these objectives and the associated implementation strategies and guidelines would improve the availability of telephone service or other communications.

Implementation of the BPMMP as well as the four Park Improvement Projects would result in no impact on the availability of water and natural gas and might result in beneficial impacts on the availability of telephone service and other communications. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT UTIL-2: EXCEEDANCE OF WASTEWATER TREATMENT REQUIREMENTS OR CAPACITY OR INCREASED DEMAND FOR WASTEWATER TREATMENT

Neither the BPMMP nor the four Park Improvement Projects contain any elements that would result in exceedance of the Central Valley Regional Water Quality Control Board's wastewater treatment requirements, nor would they require the construction of new wastewater treatment facilities or the expansion of existing ones. Only the Horseshoe Lake Area Concept Plan calls for porta-potties, currently available at this location, to be replaced with permanent bathrooms. These bathrooms would likely be composting toilets, but would not be on a septic system. Overall, implementation of the BPMMP and the four Park Improvement Projects would not result in substantial additional demand for wastewater treatment. In addition, if necessary, the City has adequate capacity to serve the BPMMP and Park Improvement Projects in addition to their existing commitments.

Implementation of the BPMMP as well as the four Park Improvement Projects would result in a less than significant impact on wastewater treatment requirements and capacity. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT UTIL-3: POTENTIAL NEED FOR NEW OR EXPANDED STORMWATER DRAINAGE FACILITIES

The BPMMP does not contain any element that would require the construction of new or expansion of existing stormwater facilities. As discussed in Section E 4.3.7, "Hydrology and Water Quality," of this EIR, each of the four Park Improvement Projects would result in a minor increase in the amount of hardened surfaces in the Park. However, the increase is negligible compared to the overall size of the Park and the widespread presence of natural surfaces in the immediate vicinity of all Park Improvement Projects locations; therefore, it is not expected to substantially increase the amount of stormwater runoff, which in turn would require construction of new of expansion of existing stormwater drainage facilities.

Implementation of the BPMMP and the four Park Improvement Plans would result in less than significant impacts on stormwater facilities. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT UTIL-4: POTENTIAL INCREASED DEMAND FOR CURRENT WATER SUPPLIES

Implementation of the BPMMP and the four Park Improvement Projects would not result in any new facilities that would place an additional demand on the current water supply in Bidwell Park. No new or expanded entitlements would be required, and sufficient water supply would be available.

Implementation of the BPMMP as well as the four Park Improvement Plans would result in no impact on local water supply. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT UTIL-5: POTENTIAL FOR INSUFFICIENT LANDFILL CAPACITY

Bidwell Park's solid-waste disposal needs are not expected to change a result of implementation of the BPMMP and the four Park Improvement Projects. Recycling receptacles will be provided in high use areas. Increases in Park usership have the potential result in an increase in demand on solid-waste disposal needs; however, neither the BPMMP nor the Park Improvement Projects aim to increase Park usership. Therefore, the BPMMP and Park Improvement Projects would not result in a substantial increase in the amount of solid waste disposed of at local landfills.

Implementation of the BPMMP as well as the four Park Improvement Plans would result in no impact related to demands on the capacity of local landfills. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

IMPACT UTIL-6: CONFLICT WITH LOCAL POLICIES AND ORDINANCES RELATED TO SOLID WASTE

Implementation of the BPMMP and the four Park Improvement Projects would comply with the City's adopted policies related to solid waste, including recycling. No conflicts with local policies and ordinances are expected.

Implementation of the BPMMP as well as the four Park Improvement Plans would not result in conflicts with local policies and ordinances related to solid waste, and no impact would occur. No mitigation is required.

Applies to: BPMMP, Trails Plan, Horseshoe Lake Area Concept Plan, Cedar Grove Area Concept Plan, Disc Golf/Trailhead Area Concept Plan

Cumulative Impact Discussion

IMPACT UTIL CUM-1

Implementation of the BPMMP and four Park Improvement Projects would result in no impact on the availability of water and natural gas, local landfill capacity, and no conflict with local ordinances related to solid waste. The projects would result in less than significant impacts with regards to wastewater requirements and need for new stormwater drainage facilities. Furthermore, implementation of the BPMMP could potentially result in beneficial impacts on the availability of telephone and other communication services in the Park. Thus, implementation of the proposed project is not expected to result in cumulative impacts on local or regional utility systems.