H. Disc Golf/Trailhead Area Concept Plan

Final Bidwell Park Master Management Plan Update

EDAW

Upper Bidwell Park Disc Golf Course

Environmental and Design Report

Final Report

August 28, 2005

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Prepared for the City of Chico
in collaboration with EDAW Inc.

INTRODUCTION

Disc golf has been played in Upper Bidwell Park for over 10 years[1]. Currently, two disc golf courses are located at the State Route 32 site. The first is a shorter 18 hole course geared toward beginner players (the short course), and the second is a 21 hole course geared toward more advanced players (the long course). In one form or another, these courses have existed for over a decade without official permission or organized maintenance activities. Due to the heightened awareness of the presence of sensitive resources in the area of the disc golf course, the City retained the services of a professional disc golf course designer to facilitate the creation of a conceptual course layout for inclusion in the Bidwell Park Master Management Plan (BPMMP) Update. The course designer was asked to redesign the existing courses so that impacts to sensitive resources were minimized and/or eliminated, while essential elements of playability for the disc golf experience were retained.

Good disc golf course design is a complicated process during which many factors must be considered. In addition to sensitive resource avoidance, factors such as playability, hole diversity, "epic factor," and safety are essential to disc golf course design. Course design questions to be answered include:

- Is the course fair?
- Is the course safe?
- Does the course flow?
- Does the course test your entire game?
- Does the course effectively use natural terrain features to provide a challenge?
- Are environmental impacts avoided, minimized, or mitigated for?

These considerations as a whole can be described as the "playability" of the course.

Below are several design options for disc golf in Upper Bidwell Park. The options are not intended to sway people to one side or another regarding disc golf at the Upper Park location. Rather, what follows are professionally designed disc golf options for Upper Bidwell Park, that consider the presence of sensitive resources on the site, and key course design criteria.

There are other key factors to consider when developing a new course, which are not addressed as part of this undertaking, including, but not limited to funding sources and demographics. An excellent reference on these other topics, as well as a general overview of disc golf and the history of Chico disc golf are available in Lon Glazner's comments to the City dated August 2005.

Circumstances taken into account during the redesign of the courses fall into two main categories:

1) environmental considerations (e.g., rare plants and other sensitive resources), and
2) basic disc golf course design (course playability).

DISC GOLF COURSE DESIGN ENVIRONMENTAL CRITERIA

Several disc golf environmental design criteria were provided by EDAW. These criteria were developed based on the knowledge of the location and extent of sensitive resources on the site. With regard to environmental concerns, the environmental design criteria could be split into two general categories:

- Resources to be avoided (with appropriate buffer zones);
- Resources to which impacts were to be minimized, but not necessarily eliminated.

[1] Lon Glazner 2005. Disc Golf Course Plan Comments submitted to City of Chico.

1. **The following resources were identified for avoidance and appropriate buffer zones were to be established around them:**

   a) **Butte County Checkerbloom** (California Native Plant Society [CNPS] List 1B); buffer zone 50 feet;

   b) **Vernal pools** (wetlands subject to state and federal jurisdiction; potential habitat for special-status invertebrates, sensitive natural communities); buffer zone 50 feet for minor structures (e.g., tees, targets), 30 feet for trails (Note: these may be subject to change based on consultation with resource agencies); and

   c) **Ephemeral drainages** (wetlands subject to state and federal jurisdiction; sensitive natural communities); buffer zone 30 feet for minor structures (e.g., tees, targets), 30 feet for trails except for trail crossings; trail crossings should be consistent with trails manual, minimize erosion potential.

2. **The following resources were identified for impact minimization:**

   a) **Blue oaks and other native oak species** (declining habitat type, sensitive habitat type under California Environmental Quality Act (CEQA), compaction and duff removal under canopy drip line and full cuts (i.e., to cambium) or breakage through bark may harm trees);

      - keep structures and anticipated disturbance area (e.g., tees, targets, benches, footprint) out of canopy drip zone plus minimum 5 foot buffer;
      - minimize trails under blue oak canopies; where trails intercept area under blue oak canopies, keep trail width to less than 3 feet;
      - provide 20 foot setback from trunks for shielding pole structures (if applicable);
      - minimize number of trees in flight line and protect trunks where necessary;
      - mitigate by protecting/restoring habitat in areas without structures/activities;

   b) **Bidwell's knotweed** (CNPS List 4; type locality for species; limited distribution; not much known about species, but abundant on site; may or may not tolerate some trampling [Note: Stuart asserted that there may be some tolerance of, or potential benefit from, trampling in his 2002 report, e.g., by reducing competition from grasses, but this was disputed following preparation of an Initial Study (IS) for the disc golf proposal in 2000; preliminary findings are that wildflower fields on site appear to have limited knotweed (e.g., only around rocks) in areas of heavy trampling (e.g., short course fairways, tees and targets and along trails where vegetation has been eliminated in knotweed areas), but more extensive knotweed in areas without fairways or trails, or with only minor trails]);

      - minimize footprint of trails in Bidwell's knotweed populations;
      - minimize number and/or avoid placement of tees and targets in areas supporting Bidwell's knotweed;
      - mitigate by protecting/restoring habitat in appropriate areas with no structures

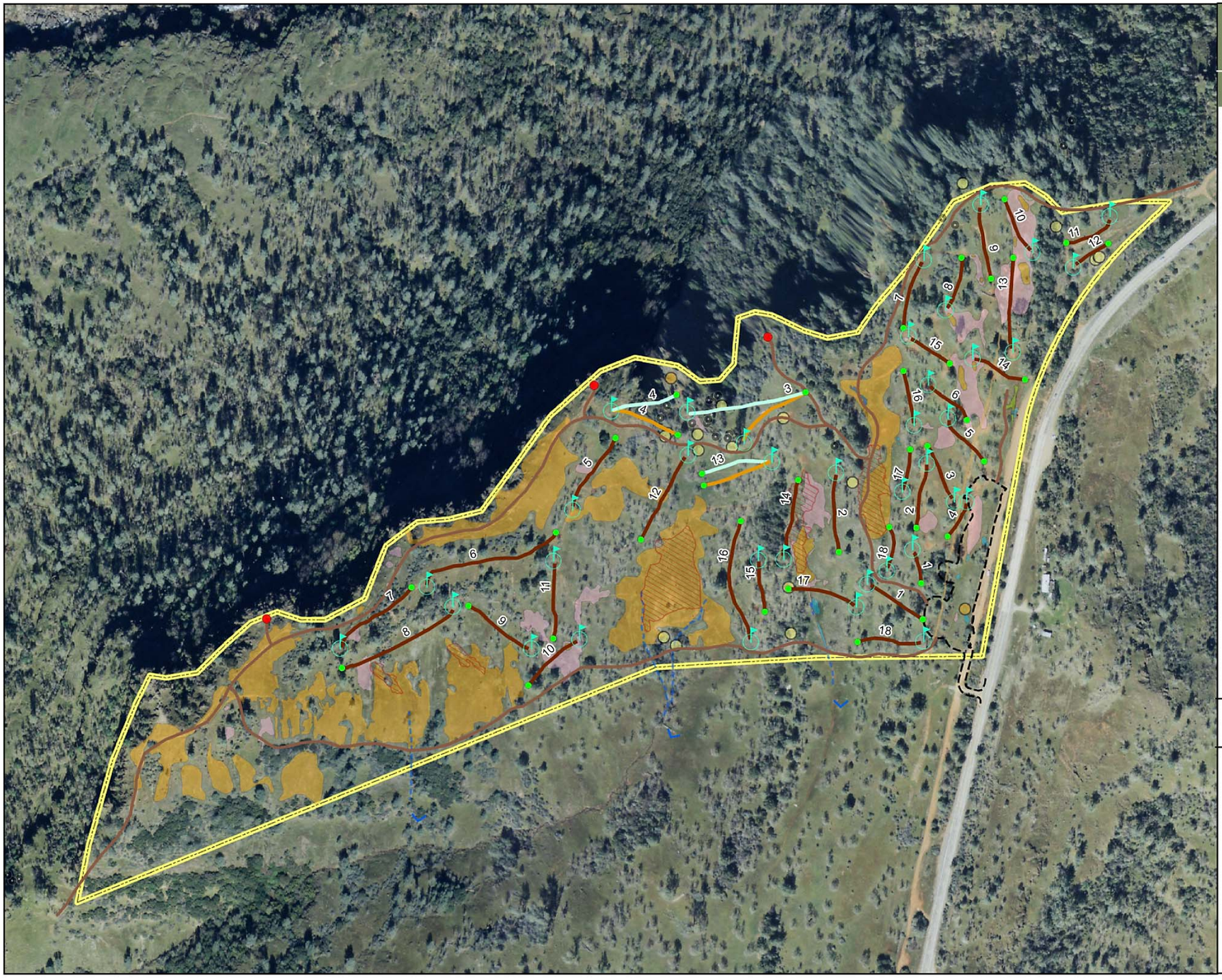
   c) **Native wildflower field** (sensitive natural community under CEQA; on shallow erosive Tuscan soil);

      - minimize footprint of trails/tees in areas supporting plant community;
      - mitigate by protecting/restoring habitat in areas with no structures

Bidwell Park Master Management Plan

Conceptual Disc Golf Course Layout

Alternative A



LEGEND

Stuart Data

- Butte County Checkerbloom
- Bidwell's Knotweed

EDAW Data

- Bidwell's Knotweed, March and May Surveys
- Butte County Checkerbloom, March and May Surveys
- Wildflower Field with Bidwell's Knotweed, May Survey
- Wildflower Field, May Survey
- Vernal Pool
- Vernal Pool Complex (Contains 6 Pools)
- Vernal Swale
- Overlook
- Tee Location
- Pins
- Summer Fairway
- Winter Fairway
- All Season Fairway
- Parking Lot Concept (68 cars)
- Old Humboldt Road Alignment
- Drainage
- Proposed Trail
- Disc Golf Course Boundary

Sources: EDAW 2005, City of Chico 2004, Mike Belchik 2005, Stuart Data 2002

N

1 Inch = 350 Feet

0 175 350 700

FEET

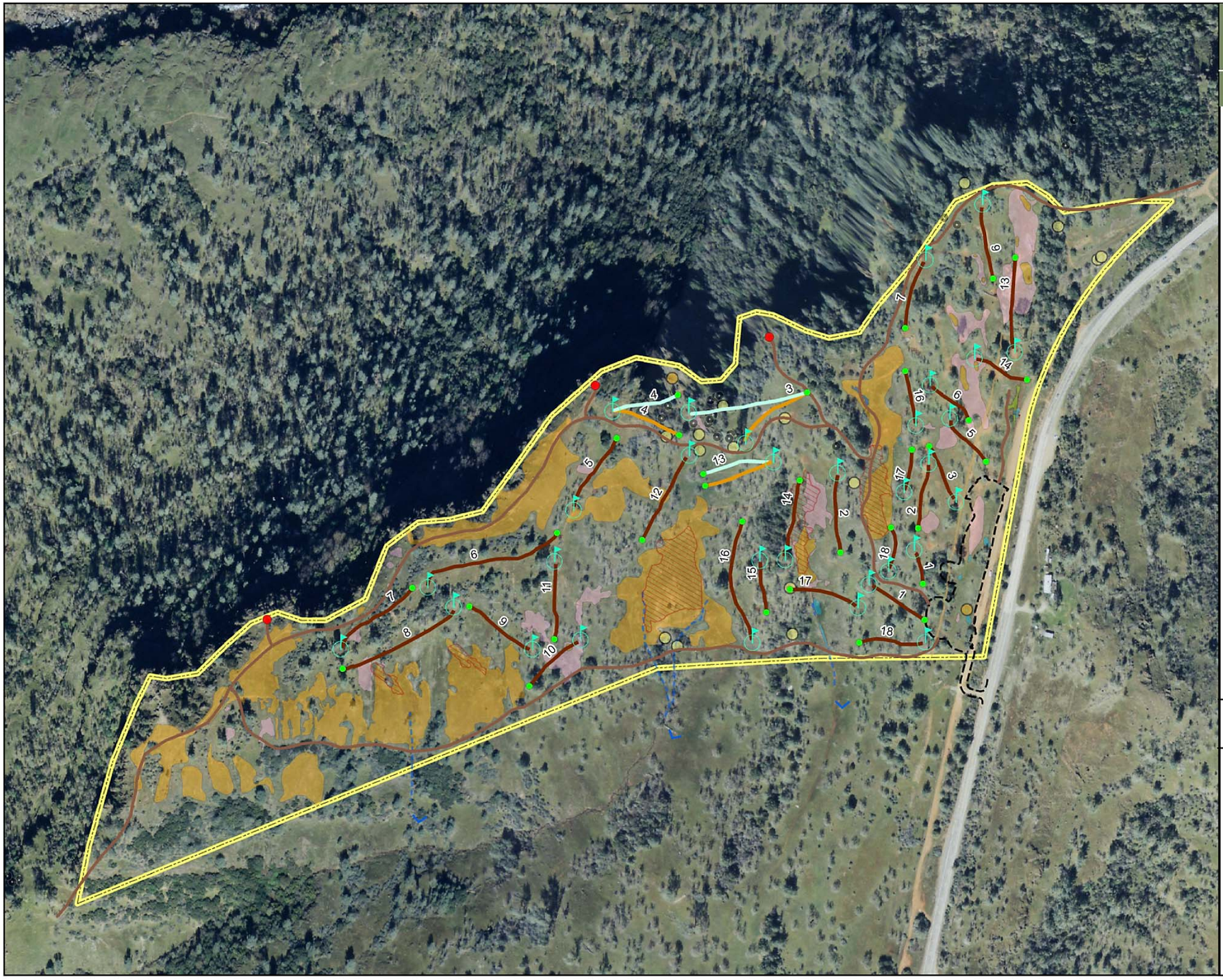
August 26, 2005

EDAW

Bidwell Park Master Management Plan

Conceptual Disc Golf Course Layout

Alternative B



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Sources: EDAW 2005, City of Chico 2004, Mike Belchik 2005, Stuart Data 2002

N

1 Inch = 350 Feet

0 175 350 700

FEET

August 26, 2005

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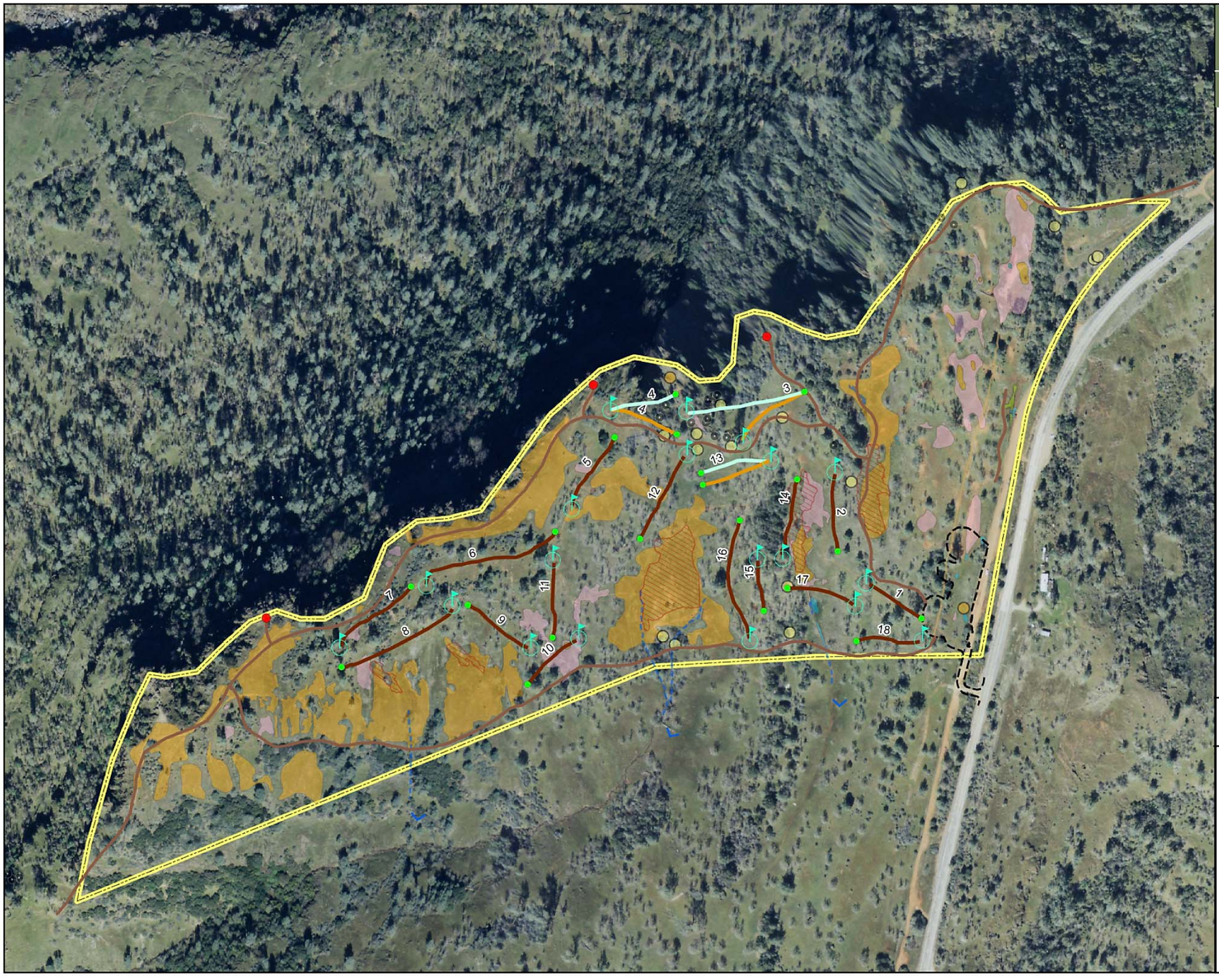
Bidwell Park Master Management Plan

Conceptual Disc Golf Course Layout

Alternative C



LEGEND

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- Wildflower Field, May Survey
- Vernal Pool
- Vernal Pool Complex (Contains 6 Pools)
- Vernal Swale
- Overlook
- Tee Location
- Pins
- Summer Fairway
- Winter Fairway
- All Season Fairway
- Parking Lot Concept (34 cars)
- Old Humboldt Road Alignment
- Drainage
- Proposed Trail
- Disc Golf Course Boundary

Sources: EDAW 2005, City of Chico 2004, Mike Belchik 2005, Stuart Data 2002

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FEET

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d) Erodible areas (support native wildflowers, thin soil areas);

- minimize footprint of trails/tees in areas of high erodibility

e) Humboldt Wagon Road (cultural resource);

- minimize development on or along this alignment to the extent feasible

3. The following areas were identified as areas to be restored or set aside for other reasons:

a) Portions of short course that have been damaged by intensive use;

b) Setback from cliff for safety and to minimize erosion;

c) Provide areas designated for uses other than disc golf (multi-use trails, staging, scenic views, nature study, etc.).

The environmental constraints and suggested avoidance criteria were provided to the disc golf designer at the onset of the design process. The designer was then tasked with developing disc golf course design options that incorporate these criteria to the greatest extent possible.

DISC GOLF COURSE DESIGN PLAYABILITY CRITERIA

Playability of a disc golf course depends on two important aspects to be considered during the design process. The first one is the layout of the course which defines the locations of each tee area and target area. Layout is the most crucial part of the design. The second major aspect important to the design with regards to playabitily is facilities design. During facilities design, the course designer makes recommendations for what types of tees and targets should be used, and provides recommendations for the placement of benches and trash receptacles. Trail locations and designs for fairways and between targets and tees are also part of this aspect.

Disc golf course design is a complicated endeavor taking many aspects into consideration. Good design starts with a solid understanding of the reasons why people play the game. A review of the Citizen's Advisory Committee (CAC) meeting summary and minutes reveals what Chico disc golfers felt was important with regard to the course they want to play:

a) Site needs good number of trees, but not too many;

b) Cliffs/rocks are good for natural hazards;

c) Grade changes are desirable;

d) Approximately one acre per tee/fairway is needed;

e) Flexibility to alternate course is desirable;

f) Current long course has good design due to lots of open space;

g) Site should not have too many other uses as too many people can interfere with play (i.e., Auburn course has too many people walking through, causing delays in play);

h) Good tees make for accurate throws;

i) Flat tee pads are the preferred infrastructure for disc golfers;

These playability criteria, as expressed by Chico Disc Golfers, are generally in line with current thought in advanced disc golf course design, but do not encompass the entire range of considerations in course layout and design.

LAYOUT CONSIDERATIONS

Disc golf is popular and engaging because of the challenge it presents to both body and mind. When engaged in a round of disc golf on a beautiful, well designed course, the mind is totally involved in the course and the game. Questions and feelings that occupy the mind during play may be:

- What's the wind doing?
- How far away is that target?
- What's behind that dropoff?
- That's a beautiful mountain we're shooting towards.

Part of the enjoyment of disc golf stems from the intimate interaction with landscape the player experiences. A well designed course should explore the nooks and crannies of a landscape location while at the same time providing sweeping vistas. Good design will bring a variety of emotions into play, including determination, fear, revelation, pride, humility, awe, and others.

An important first question to be answered during layout designing is what the target audience is. In other words, is this course designed as a summer camp activity for 8–14 year old players, or is the course going to host world-class tournaments with the best players in the world? The answer to this question guides all subsequent design activity. Beginner players will be discouraged by extremely difficult holes that have a high lost disc potential. Likewise, advanced or professional players will quickly grow bored with a course that is too short and easy. In general, better players appreciate more difficult courses, but the challenge must be perceived as reasonable and fair. Regardless of the intended player audience, the following criteria apply:

1. Course should have solid "mechanics";

    a. Provide for a safe experience;

        i. Tees and greens a safe distance apart;

        ii. Consider the safety of other park users;

        iii. Shade available for hot day play.

    b. Course should "flow";

        i. Clearly defined "Frisbee central" and disc golf bulletin board that provides course rules, upcoming tournaments, course maps, etc.;

        ii. short walks between greens and tees whenever possible (but can't be located too closely);

        iii. minimize or eliminate crossing fairways.

c. Course should have infrastructure capable of handling intended use;

   i. High quality tees;

   ii. Basket targets;

   iii. Shade benches;

   iv. Trash and recycle receptacles;

   v. Appropriately designed trails, terracing, mulching, and other maintenance[2].

2. Course should provide a fair and reasonable challenge;

   a. Course should have a diversity of shots

      i. left and right and straight holes;

      ii. uphill and downhill, side hill in both directions;

      iii. long medium and short holes, including use of par 4's and 5's if possible;

   b. Course should demand the use of all the discs in your bag;

   c. Course should creatively use the risk and reward aspects of the game;

   d. Course should not be a grueling test of patience, but should be a mix of easy, medium, difficult, and extremely difficult holes

3. Course should use the land creatively;

   a. High "epic factor[3]";

   b. Highlight scenic wonders of course, including fantastic trees, vistas, distant mountains, waterfalls, etc.;

   c. Course should take you on an adventure;

   d. The holes should work together and provide a sense of pace and rhythm to a round of golf;

   e. The course, as well as individual holes, should have unique character that burns itself into memory and creates the desire for a return visit

   f. Course should be pretty, and look like it's cared for.

[2] Ideally, there should be a maintenance plan that specifically spells out what maintenance will be done, when, and how.

[3] Epic factor is a term used to describe how the course uses the most spectacular features available for a given piece of land. In the case of Upper Bidwell, it is the sweeping vistas available near the cliff's edge.

APPLICATION OF ENVIRONMENTAL AND COURSE DESIGN PRINCIPLES TO UPPER BIDWELL PARK DISC GOLF COURSES

When designing the options described earlier, the following assumptions were used:

1. The short course(s) would be used primarily by beginner players;
2. The long course would be used by more advanced and professional players;
3. Both courses would be used for tournaments.

The south end of the parking area[4] was chosen as Frisbee Central for both courses. That way, a single bulletin board and central meeting location could be used by visitors to both courses. This will minimize the overall footprint of the courses.

GENERAL RECOMMENDATIONS FOR COURSE INFRASTRUCTURE

This document is not intended to provide construction specifications, but rather to provide a general guiding sense of principle with regard to infrastructure. Infrastructure is a very important aspect in the design of a good disc golf course. Infrastructure includes the structural elements of the course such a improved tee areas, baskets, benches, trash/recycling receptacles, and trails. Players should be able to easily navigate their way around the course. Thus, tee signs for each hole as well as small directional signs are recommended to direct players to the next tee area.

Constructing of cement tees is strongly recommended for the Bidwell Park courses for the following reasons:

1) cement tees require little to no maintenance once they are installed, and will, over the long run, save money and time;

2) cement tees prevent the tees from gradually expanding over time as players search for good footing during wet weather, and

3) the cement tees may help lessen compaction by spreading out the pressure over a larger area when players are teeing off.

Baskets are recommended for the course for the following purposes:

1) baskets are the state-of-the-art high quality target,
2) baskets reduce wear and tear on the green, because fewer shots roll away or miss the target altogether, and
3) baskets are required for Professional Disc Golf Association (PDGA) tournament play.

Because disc golf is strongly landscape-oriented, an approach that integrates all structures with the natural landscape is strongly recommended. For example, trails should be as narrow as possible and should be marked with natural lava rock instead of wooden planking. Cement tees may be colored to blend in with the natural environment. A natural looking course will add to the experience of the players and non-playing visitors alike.

SPECIFIC DISC GOLF COURSE LAYOUT OPTIONS

Once the design criteria were established several conceptual course layouts were developed as follows:

[4] Parking area as presented in concept maps by EDAW at CAC meeting July 2005.

1. Redesign of the short and long courses, with 18 holes retained for each course (Option A);
2. Redesign of the short course into a 12 hole layout, while retaining the redesigned long course (Option B);
3. Redesign of a single long course with short course eliminated (18 holes for advanced players) (Option C).

In addition to these layout options, concepts for associated structures and elements were developed (Exhibit 4 and 5). These concepts demonstrate how use of the site for disc golf would be integrated with other uses of the site such as hiking, scenic viewing, wildflower study, etc.

18 HOLE SHORT COURSE

An important assumption driving the design of the short course was that this course would be used primarily by beginner players. Thus, the average length of holes was shortened, and some holes were designed to be very short (150 feet). The number of oak trees that would be in play was minimized, in many instances, by relocating holes away from oak tree groves. Blind pin locations, i.e., pins that are not visible from the tee area, were also minimized because they typically cause confusion and delay for beginner players. The presence of at least one longer hole was also ensured, so that players could begin to develop their distance throws.

While the resulting 18 hole short course is friendly toward beginners, it suffers from a lack of length diversity, and many of the holes have a certain "sameness" to them. This was necessary given the constraints on usable land, and the desire to keep the course easy. Table 1 below gives the lengths of the individual holes:

Table 1
Short Course Hole Lengths (Proposed Layout)

Hole	Length (ft)
01	108
02	219
03	198
04	166
05	188
06	174
07	234
08	180
09	244
10	196
11	176
12	131
13	309
14	190
15	156
16	180
17	139
18	144
Total	**3,332**

Source: From EDAW GIS information.

For specific locations of the holes and how they relate to sensitive resources, see Option A.

12 HOLE SHORT COURSE

This course layout strongly resembles the 18 hole version but eliminates 6 of the holes (Option B). Specifically eliminated are holes 4, 8, 10, 11, 12, and 15. Elimination of these holes reduces the overall footprint of the course, and untangles the layout quite a bit. It would be possible with this layout, to design two tees per hole for diversity of playing experience.

18 HOLE LONG COURSE

Retaining as much of the original character of the course as possible was a desirable outcome of the redesign process. In order to accomplish this goal, existing holes were used whenever possible. This also helped minimize resource impacts by confining use to already used areas instead of opening new areas to use. Thus, a strong preference was given to the use of existing pins and tees whenever possible. In many cases it was necessary to move either the pin or the tee out of the way of oak trees. However, if all the tees and pins were moved away from the oak trees, the course would not provide a reasonable challenge.

If the short course is eliminated from further consideration, it is recommended to use this 18 hole layout for the sole remaining course. Table 2 below summarizes the technical aspects of the long course.

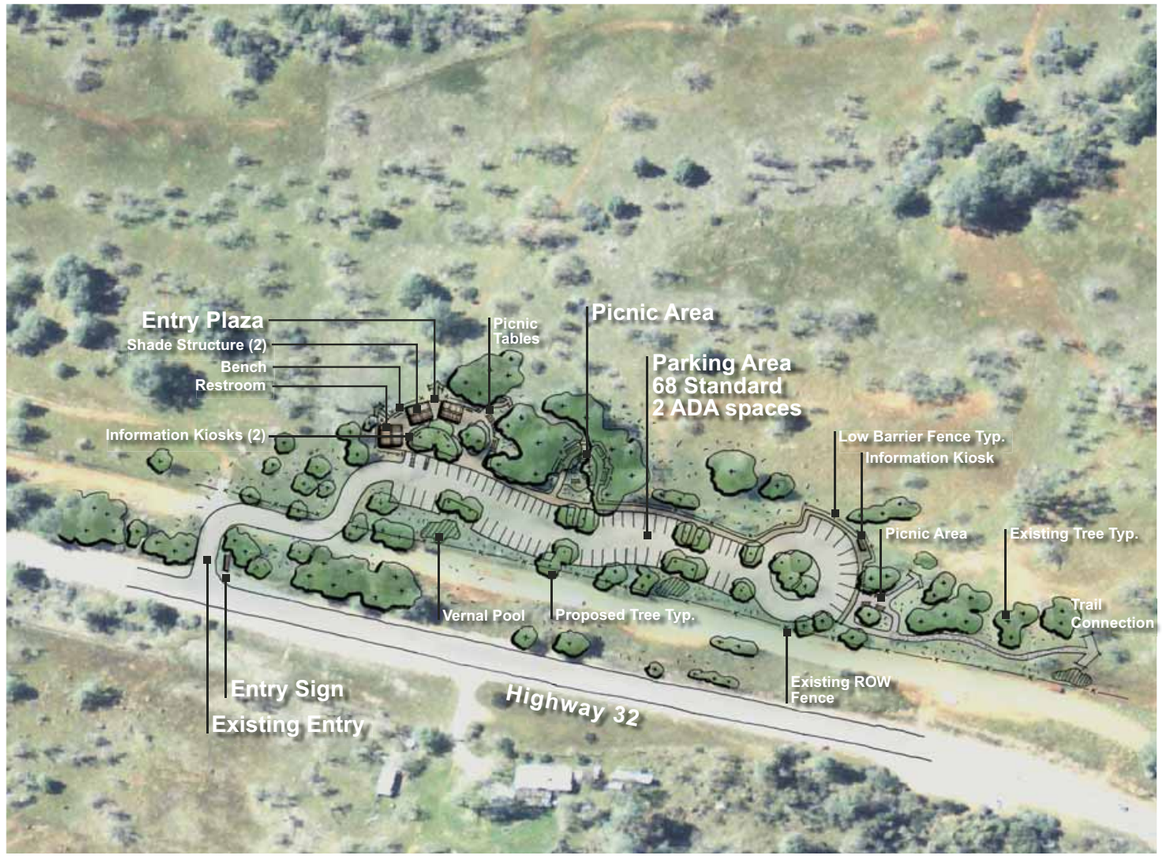
Table 2
Long Course Hole Lengths (Proposed Layout)

Hole	Season	Length
01	all	211
02	all	265
03	winter	
03	summer	397
04	winter	
04	summer	221
05	all	276
06	all	502
07	all	321
08	all	431
09	all	251
10	all	224
11	all	256
12	all	317
13	all	232
14	all	265
15	all	171
16	all	420
17	all	234
18	all	219
Total		**4,340**

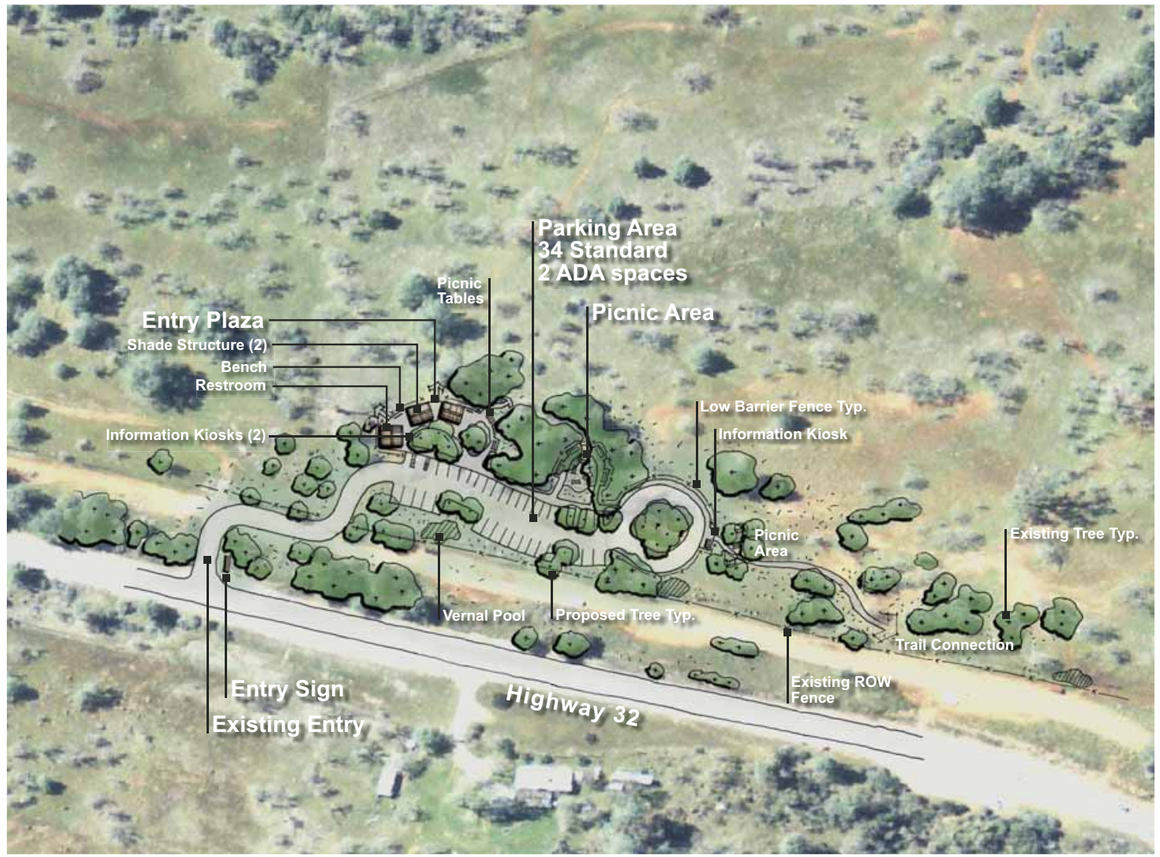
Source: From EDAW GIS information.

Bidwell Park Master Plan

DISC GOLF CONCEPTS



Trailhead Alternative A (18 and 18 Hole Courses)



Trailhead Alternative B (18 Hole Course)

Parking/Trailhead Examples

13 July 2005

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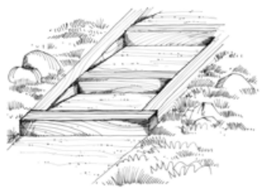
Bidwell Park Master Plan

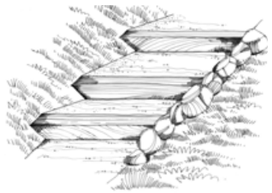
DISC GOLF CONCEPTS

Course Plan Along South Rim Trail

Course Plan at Trailhead



Bordered Steps



Steps on Side Slope

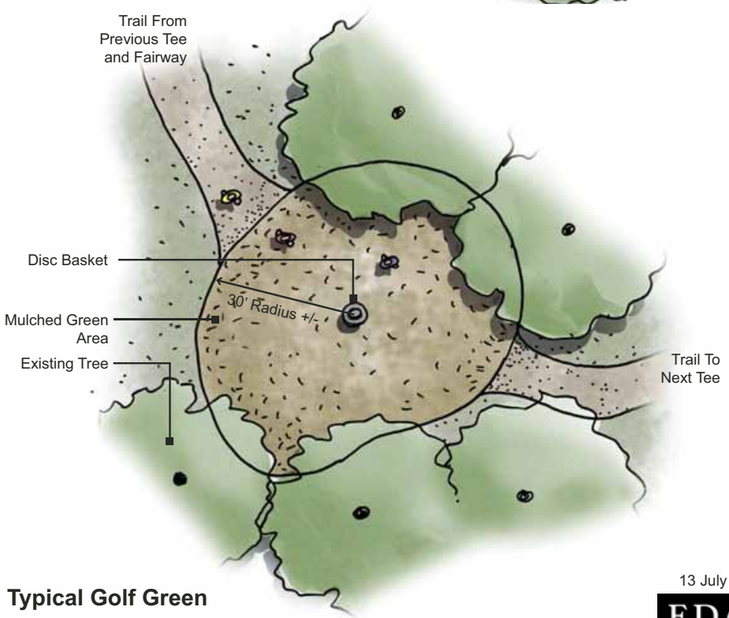
Step Railing

Trail Edge with Gravel Surfacing

Conceptual Trail Examples

Disc Golf Examples

Typical Golf Tee



Typical Golf Green

13 July 2005

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A hole by hole description for the long course, along with special considerations by hole is provided below:

Hole 1 This hole would begin near the parking lot and utilize an already existing "practice hole." It would be possible to move the pin out from the grove of oak trees that it is in now, but that would degrade the quality of the hole significantly. The tee may need to be moved slightly depending on facility construction nearby.

Hole 2 A new tee would be constructed approximately 70 feet to the east of the current location. The pin location would be kept the same as current.

Hole 3 Signature hole of the course. Due to the presence of checkerbloom plants to the east of the current pin location, a change in pin location is recommended, depending on whether the checkerbloom is in active growth or bloom, or whether it has gone dormant as it does in summer, fall, and early winter. During the time that the checkerbloom is inactive (generally, mid-summer through early winter), the pin would be located close to where it is now. During the active season, the pin would be relocated south of the current location, which also shortens the hole considerably. Pins can easily be moved by installing multiple collars, and the pin can be carried to the new location in minutes.

Hole 4 Because of checkerbloom considerations, this hole is also proposed to have different active and dormant season configurations. This time, instead of relocating the pin, different tees will be used. Although it appears that the fairway crosses a checkerbloom plant, the hole is short, the plant is protected, and there would be little to no impact to that plant, because it is not in the "activity zone" of that hole.

Hole 5 The tee for this hole was moved to a different location for the purpose of totally removing any possibility of a disc landing near the edge of the cliff. The tee relocation also takes a field of wildflowers and Bidwell's knotweed out of play. The new tee is located about 100 feet to the southeast of the old tee. The pin is in the same location #4 of the current course configuration.

Hole 6 This hole was lengthened to a par 4. It is a classic right turning drive/left turning upshot par 4.

Hole 7 Used current hole, which was judged to be satisfactory.

Hole 8 "The Monster." A new par 4, which measures over 500 feet uphill. At the end, the hole curves left into a grove of trees to a new pin location. Large bushes guard the entrance to the green area. There is a possibility that errant drives will stray into a Bidwell's knotweed field, but the majority of shots will not have an affect to that adjacent sensitive resource.

Hole 9 Uses current #9, but the tee will be shortened slightly to take it out of a grove of oaks that is currently occupies.

Hole 10 Same as current #10.

Hole 11 Same as current #11.

Hole 12 This will require the construction of a new connecting trail that winds through a grove of oak trees to get to the new tee (See Option s A, B, and C Exhibits). The grove of oak trees will be preserved (except for the small trail winding through it), because they are some of the healthiest trees on the whole site. Thus, rather than use the trees as part of the course, it is proposed to avoid impact to this grove. The trail could be located outside the oaks, but would not be as desirable during summer play in hot weather. The hole itself is a straight shot between several oak trees. Because the trees would be exposed

to discs traveling at high velocity, this would be a good spot to use protective measures for the trunks. A series of parallel 1 x 1's held together with twisted wire, and then all wrapped around a trunk would be an aesthetically pleasing, natural way to protect the trunks and major branches. This hole uses an existing pin, which would be relocated outside the grove of oaks where it is now.

Hole 13 It would be possible to relocate the tee for this hole outside the grove of oaks where it is now. If it is decided that this tee needs to be relocated, there is a spot about 80 ft south of the current tee area. Other than that, this hole utilizes an existing hole.

Hole 14 This hole utilizes the pin for #20 on the current course, but the tee area is to be relocated for the protection of Bidwell's Knotweed located down the right side of the fairway. The tee will be relocated such that the best shots will naturally stay away from areas of Bidwell's Knotweed. It is possible that some discs will stray into that area, but the impacts will be far less than they are currently.

Hole 15 This is a new hole. The tee area will be the sitting and bench area that was carved into the hill below the tee for #21 of the current course. The fairway will be narrow, and defined by tree trunks and bushes, although the distance of the hole is rather short. Minor trimming of dead branches will be required, and possibly the pruning of one live branch approximately 1.5 inches in diameter will also be required.

Hole 16 This hole utilizes an existing fairway on the course, but uses it backwards. This is a long hole, and the pin was located to the left to avoid Bidwell's Knotweed on the right side of the green area.

Hole 17 Same as current #21, except that it is necessary to move the pin to the right between two groves of oak trees. This is because the original pin location is now being used by the first hole of the new layout.

Hole 18 This is a brand new hole. Running near (but not to close to) the fence line on the south edge of the property, this hole takes the player right back to the parking lot.

SUMMARY

For the lower (long) course, the redesigned course was able to avoid approximately 90% of the Bidwell's knotweed on the course, as well as relieving pressure on other wildflower/sensitive areas. Although the short course was able to avoid some sensitive resources, it was not possible to avoid all sensitive resources, but significant reduction of impacts was achieved.

This document is intended to provide information to the community of Chico and to help guide decision making in the process of updating the Master Management Plan of Chico.