DRAFT TRAIL MANAGEMENT PLAN

FOR THE

TWIN BUTTES DEVELOPMENT

LA PLATA COUNTY, COLORADO

Prepared for:
Lightner Creek Ranch, LLC

Prepared by:
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2243 Main Avenue, Suite 4
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February 2008

ECOSPHERE ENVIRONMENTAL SERVICES

August 11, 2008

Dear Reader,

This document was completed in February 2008 and is currently in *draft* form. Upon direction from the City to the developer to provide a trail management plan, Ecosphere prepared this document for Lightner Creek Ranch, LLC (LCR). The purpose of the document was to recommend a trail system within the proposed Twin Buttes development that considers impacts to plant and wildlife associated with non-consumptive recreation. It was prepared with conceptual plans provided by LCR, field surveys, consultation with the Colorado Division of Wildlife (CDOW), and the best scientific information available at the time.

This is not a regulatory document; rather, it is intended to serve as a guidance document for mitigating and managing impacts to wildlife from the proposed development. Further, it has been advanced as a draft because the mitigation measures recommended within this document are subject to revision pending public comment and any changes to the proposed development that may occur throughout the planning process.

This document will become final at the time City Council approves the final plan for Twin Buttes, should that occur. Updates to the final document may take place if deemed appropriate by the governing body responsible for implementing the plan.

Sincerely,

Mike Fitzgerald
Owner

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EXECUTIVE SUMMARY

Ecosphere Environmental Services (Ecosphere) was contracted by Lightner Creek Ranch, LLC (LCR) to prepare a Trail Management Plan for the proposed Twin Buttes Development (Twin Buttes), in La Plata County, Colorado, immediately west of Durango (Figure 1). The 2007 Conceptual Plan for the proposed 597-acre property consists of generalized development areas (Village Areas) with 595 dwelling units, associated new road construction, and recreational and shared-use trails. Approximately 80 percent of total acreage (478 acres) is undeveloped, including designated open space, a permanent conservation easement, and general common elements (GCE).

While the impacts of trails on wildlife are often less intensive than large developments, trails can negatively impact wildlife. Indeed, Boyle and Samson (1985) reported outdoor recreation had negative impacts to wildlife in 81% of studies reviewed. As interest and participation in outdoor recreation continues to increase, coupled with the new residents that will live adjacent to almost 400 acres of open space, developing a trail system within the Twin Buttes is an important component of minimizing impacts to wildlife. Developing a trail system creates predictability for wildlife: the more predictable outdoor recreation is the better wildlife will be able to adapt to it. Conversely, dispersed recreation and social trails, which are certain to develop, have the potential for greater impacts to wildlife (Hellmund Associates 1998). Therefore, the objectives of this Trail Management Plan are to 1) identify the potential impacts trails have on wildlife, 2) recommend where a recreational trail could be developed with the least impacts to wildlife, and 3) recommend trail specifications and other tools to minimize impacts to wildlife.

Finally, we hope this document serves as an education tool to effectively manage trails for wildlife. While this plan may help locate and design trails to minimize impacts to wildlife, it does not include a plan of enforcement – that is left to the individual. In a survey of recreationists, Taylor and Knight (2003) found about 50 percent felt recreation did not have an impact on wildlife and it was acceptable to approach wildlife <200 feet. Further, recreationists tended to blame other user groups as a cause of stress for wildlife. As human presence increases in the area, thereby exerting pressure on local wildlife and shrinking natural habitat, it is critical recreationists recognize their impacts to wildlife and a prevailing view of co-existence and sustainable enjoyment of the natural environment be facilitated through public education.

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1.1 PROJECT DESCRIPTION AND LOCATION

Ecosphere Environmental Services (Ecosphere) was contracted by Lightner Creek Ranch, LLC (LCR) to prepare a Trail Management Plan for the proposed Twin Buttes Development (Twin Buttes), in La Plata County, Colorado, immediately west of Durango (Figure 1). The 2007 Conceptual Plan for the proposed 597-acre property consists of generalized development areas (Village Areas) with 595 dwelling units, associated new road construction, and recreational and shared-use trails. Approximately 80 percent of total acreage (478 acres) is undeveloped, including designated open space, a permanent conservation easement, and general common elements (GCE).

Twin Buttes is located near the intersection of Highway 160 and Highway 141 (Wildcat Canyon, Figure 1). The legal description for Twin Buttes is:

Township 35 North, Range 10 West,
Sections 23, 25, and 26
New Mexico Prime Meridian (NMPM)
La Plata County, Colorado

1.2 PROJECT OBJECTIVES

As interest and participation in outdoor recreation continues to increase, coupled with the 1,200-1,800 new residents that will live adjacent to almost 400 acres of open space, developing a trail system within the Twin Buttes is an important component of minimizing impacts to wildlife. Developing a trail system creates predictability for wildlife: the more predictable outdoor recreation is the better wildlife will be able to adapt to it. Conversely, dispersed recreation and social trails have the potential for greater impacts to wildlife (Hellmund Associates 1998). Therefore, the objectives of this Trail Management Plan are to 1) identify potential impacts trails have on wildlife, 2) recommend trail specifications and other tools to minimize impacts to wildlife, and 3) recommend where a recreational trail could be developed with the least impacts to wildlife.

We also hope this document serves as an educational tool to effectively manage trails for wildlife. While this plan may help locate and design trails to minimize impacts to wildlife, it does not include a plan of enforcement – that is left to the individual. In a survey of recreationists Taylor and Knight (2003) found about 50 percent felt recreation did not have an impact on wildlife and it was acceptable to approach wildlife < 200 feet. Further, recreationists tended to blame other user groups as a cause of stress for wildlife. In an effort to facilitate human co-existence with wildlife and reduce human-wildlife conflicts, it is important recreationists recognize and understand their impacts to wildlife, and to plan trails accordingly.

2.0 IMPACTS TO WILDILFE FROM TRAIL DEVELOPMENT

While the impacts of trails on wildlife are often less intensive than large developments, trails provide opportunities for outdoor recreation that can negatively impact wildlife. Boyle and Samson (1985) reported that in 81% of studies reviewed, outdoor recreation had negative impacts to wildlife. Outdoor recreation has become increasingly popular in the last decade and includes many different activities varying with the season including hiking, trail running, mountain biking, horseback riding, snowshoeing, and skiing. Regardless of the form of outdoor recreation, it has the potential to impact wildlife in several important ways. Many of these impacts are addressed in detail under separate cover in the Wildlife Management Plan, and many impacts are either unknown or not well documented; therefore, we focus on the following impacts of trails to wildlife, 1) increased energetic costs, 2) alteration of behavior and movement patterns, 3) decreased fitness and consequent reproduction, 4) increased injury and mortality, and 5) loss, alteration, and fragmenting habitat. These impacts are addressed below. This discussion is neither intended to address all potential impacts to wildlife from trails, nor is it meant to address all species impacted; rather, it provides an overview and gives examples of how a recreational trail impacts wildlife in general. Additionally, virtually nothing is known as to whether wildlife responds differently to different forms of recreation, e.g. hiking vs. mountain biking. Therefore, we assume all forms of recreation impact wildlife equally.

2.1 INCREASING ENERGETIC COSTS

Wildlife typically avoids human interaction by fleeing an area, thereby wasting critical energy reserves or surrendering otherwise suitable habitat. Wildlife that is displaced into less suitable habitat may face greater risk of predation or reduced availability of quality of habitat for food (Papouchis et al. 2001). In winter, deer and elk move to south-facing slopes at lower elevations to conserve energy and maintain body condition. Energy consumed to avoid humans on the trail can lead to increased weight loss and poor body condition that may contribute to direct mortality (e.g. starvation), or indirect mortality (e.g. predation). Indeed, in southwestern Colorado, winter habitat is the limiting factor for populations of deer and elk (Andy Holland, CDOW terrestrial wildlife biologist, personal communication).

2.2 ALTERING BEHAVIOR AND MOVEMENT PATTERNS

Seasonal and daily behavior and movement patterns of wildlife can be impacted by the placement of recreational trails and human presence. Immediate changes in these patterns are often indicated by 1) flush response, when the animal flees in response to human presence, 2) alert distance, the distance between the recreationist and the animal at first point of alarm, 3) flight distance, the distance between the recreationist and animal at first point of flight, and 4) distance moved, the distance traveled by the animal from the initial point of alarm until to stopped fleeing (Taylor and Knight 2003). For example, Miller et al. 2001 showed the presence of dogs resulted in a greater area of influence, alert and flush distance, and distance moved for mule deer.

A report compiled by Hellmund Associates (1998) describe aggressive bird species observed following trails and displacing other sensitive species, resulting in increased predation on songbirds and other neotropical migratory birds. And, snow compaction by snowmobiles has been shown to increase winter mortality in subnivean small mammals by reducing their movements (Jarvinen and Schmid 1971).

2.3 DECREASED FITNESS AND REPRODUCTION

The presence of humans on trails can also lead to increased stress on wildlife populations, thereby reducing fitness and reproductive output. Recreation near avian nests is known to cause lower nestling success or nest failure in some species (Knight and Gutzwiller 1995). Repeated recreational intrusion can also increase avian nest predators by common bird species like the gray jay (*Perisoreus canadensis*).

2.4 INCREASED INJURY AND MORTALITY

Wildlife, especially pregnant or newborn animals, animals in heat stress, or starving or malnourished animals, could be killed by dogs off a leash, mountain bikes, or possibly horses, if they are not able to escape them. Additionally, while direct mortality may not result, such encounters could stress or tire an animal resulting in increased risk of predation later on.

2.5 HABITAT LOSS, FRAGMENTATION, AND ALTERATION

Trail construction removes and fragments wildlife habitat through trail construction; it also alters habitat by impacting soil, causing erosion, and introducing noxious weeds and pollutants like dust (Foreman 1995). Mountain bikes and horses also provide a mechanism for introducing noxious weeds and dogs off leash can trample vegetation (Miller et al. 2001). For more impacts to wildlife from habitat loss, fragmentation, and alteration see Section 2.1, Wildlife Management Plan.

Additionally, changes to wildlife habitat from trails can have impacts that extend for hundreds to thousands of feet from the trail and are referred to as the trail distance effect (Hellmund Associates 1998), or more commonly as the zone of influence, the areas paralleling a trail within which wildlife will flush from a particular recreational activity (Miller et al. 2001). And the greater the zone of influence, the more disturbing the recreational activity is to wildlife (Miller et al. 2001). This suggests that wildlife habitat is impacted by much more than just the habitat lost to construction of trails.

3.0 BENEFITS OF TRAIL DEVELOPMENT

The primary benefit of the proposed trail plan is connectivity to the U.S. Highway 160 West/Lightner Creek trail. The U.S. Highway 160 West/Lightner Creek trail is identified as one of the primary trails in the City's trail system because Highway 160 West is a major access between Durango and western La Plata County (City of Durango 2001). It is also a major regional highway for commercial and tourist traffic. Mountain bikers completing the popular Dry Fork loop from Lightner Creek and road cyclists touring the west end of the County usually return to Durango via Highway 160 West (City of Durango 2001). Additionally, this connection would serve the City of Durango Parks, Open Space, Trails (POST) Master Plan objectives to create real alternatives to automobile travel (City of Durango 2001). Such a trail system would facilitate multi-modal travel, namely bike commuting, thereby reducing automobile traffic and associated noise and emissions, also beneficial to wildlife. Further, the overall objectives of this plan are consistent with the policies outlined in the City of Durango 2007 Comprehensive Plan.

Other obvious benefits to the community from the recreational trails within the proposed Twin Buttes include opportunities to:

- participate in a variety of outdoor recreational activities;
- view and appreciate wildlife; and
- be a steward of the natural environment.

Finally, the trails system serves as a fire management tool to protect homes and human life from forest fires (See Forest Management Plan).

4.0 RECOMMENDATIONS

Based upon our knowledge of the area, biological expertise, and literature review, we recommend the following measures to develop a trail system and management plan for the Twin Buttes property with the least impacts to wildlife:

4.1 DEVELOPMENT OF TRAIL SYSTEM

To minimize impacts to wildlife, the location of trails and trail density should be thoughtfully considered. A trail system should be engaging and accommodating enough to recreationists so as to discourage social trails and dispersed recreation, thereby allowing wildlife to better adapt to recreational activities.

- **Create trails in anticipation of, or concurrently with, development**

Consistent with the objectives of the City of Durango (2001), we recommend developing trails in advance of development to most effectively locate, plan, and manage the trail system.

- **Minimize trail density, especially in critical wintering habitat for deer and elk and wildlife corridor**

Because critical wintering habitat is the limiting factor for deer and elk populations in southwestern Colorado, we recommend trails be minimized in these habitats and no trails be located in the natural wildlife corridor in the eastern portion of the Village areas (Figure ; See section 2.2 and Attachment B, Wildlife Management Plan).

- **Provide wildlife access to Lightner Creek**

Wildlife, especially deer and elk, access Lightner creek in the evenings and early mornings to drink and browse, especially in the summer months when use of the shared use trail along Lightner Creek (Figure 1) will likely be highest; therefore, we suggest allowing wildlife unobstructed access to Lightner Creek. Specifically, we recommend that no trail be constructed along a large section of Lightner Creek, preferably adjacent to montane grassland or pastureland habitat, to prevent wildlife from having to cross a trail to get o water, or be hindered from doing so by recreationists on the trail.

- **Utilize existing disturbance**

We recommend using the existing railroad grade, the 2-track road, and any other existing disturbance before creating new disturbance to build trails as trail impacts may be lessened if created in an already disturbed area.

- **Narrow rights-of-way**

We recommend narrow rights-of-way (.e.g. single tracks) for the creation of any new trails, as they tend to be less disruptive to wildlife and their habitats (Foreman 1995) and minimize the zone of influence (Hellmund Associates 1998).

- **Following existing habitat edges**

We recommend creating trails along the edge of continuous, high-quality habitat, rather than through the center, especially the interior of forested habitats (Hellmund Associates 1998).

- **Avoid large continuous tracts of habitat**

We recommend large, undeveloped areas of wildlife habitat remain undisturbed.

- **Blend new trails with surrounding environment**

We recommend new trails be located and constructed to minimize vegetation removal, avoid hillside scarring, and blend with the surrounding topography and natural landscape.

- **Trail construction**

We recommend trail construction be coordinated with the Wildlife Management Team (see Section 3.1, Wildlife Management Plan) to impact wildlife habitat as little as possible, especially near Lightner Creek.

- **Build a pedestrian bridge over Lightner Creek**

To avoid erosion to the stream bank from dispersed creek crossings, we recommend building a pedestrian bridge to encourage recreationists to cross Lightner Creek in one area designed specifically for them. We recommend such a bridge be located in consultation with the Wildlife Management Team to find an appropriate location. We also recommend the bridge include interpretive signs to educate recreationists on the natural history of the area, especially Lightner Creek and aquatic resources.

4.2 TRAIL MANAGEMENT AND MAINTENANCE

Developing and building a trail system also requires management and regular maintenance. Management of the trail system should be done in cooperation with the Wildlife Management Team and should evaluate cumulative and unforeseen impacts to wildlife to modify the trail system and management plan as necessary.

- **Implement seasonal closures for critical deer and elk wintering habitat**

To minimize impacts to wildlife in winter, a critical time of year for elk and deer, we recommend seasonal closures from December 1 – March 31 on trails in designated open space. We suggest seasonal closures are evaluated each year area by the Wildlife Management Team in relation to snow levels, documented occurrences of human conflicts with deer and elk, and changes in wintering movement and behavior patterns of deer and elk to allow for flexibility in implementing seasonal closures and assure their effectiveness.

- **Conduct regular trail maintenance**

We recommend the trail system be maintained regularly, commencing early spring and routinely monitored through fall. Maintenance should include clearing of hazard trees along the trail, revegetating and naturally obstructing social trails, cleaning and building dips and swales to control water erosion, improving ruts along service roads, shrub and tree trimming, etc.

- **Dogs must be on a leash at all times**

Regardless of the mode of recreation, i.e. hiking, mountain biking, horse back riding, etc. dogs must be kept on a leash at all times to avoid chasing or harassing wildlife, and also to reduce the area of influence, and changes in behavior and movement patterns of wildlife.

- **Prohibit rock climbing and bouldering on Twin Buttes**

Where potential occurs, we suggest prohibiting rock climbing and bouldering on the Twin Buttes to avoid visual impacts from anchors, chalk, etc. and impacts to wildlife, especially bats, black bear, mountain lion, and raptors.

- **Prohibit the use of OHVs and snowmobiles**

To avoid direct mortality to small mammals, reptiles, and birds, we recommend OHVs and snowmobiles be prohibited for recreational use.

- **Provide user amenities**

We suggest providing simple user amenities to create a functional, clean, and aesthetically pleasing trail, such as trail benches, dog waste bags, directional signs, and garbage cans along the proposed shared use (commuter) trail only (City of Durango 2001; Figure 1)

- **Provide a public rest room along the shared-use trail**

As development of Twin Buttes progresses and more residents and public begin to use and recreate in the area, especially the proposed shared use trail (Figure 1). We recommend monitoring the impacts of human waste and suggest a small, composting public restroom.

4.3 PUBLIC EDUCATION

The importance of public education cannot be overstated. As human presence increases in the area, thereby exerting pressure on local wildlife and shrinking natural habitat, it is critical that a prevailing view of co-existence and sustainable enjoyment of the natural environment be facilitated through public education.

- **Educational kiosks**

We recommend education kiosks be created at various locations along the trail system. The kiosks would serve to as a medium for visitor education, trail information, and as a means to collect user information.

- **Visitor educational materials**

We recommend that educational materials including CDOW brochures, BearSmart brochures, Leave No Trace cards, etc., along with general trail locations and descriptions be provided at a central location within the Village (e.g. community center) and trail kiosks (Figure 1). Educational materials should focus on the importance of staying on trails, not approaching or feeding wildlife, Leave No Trace ethics, human safety, and overall awareness of wildlife.

- **Other informational tools**

Other Informational tools, including newsletters, and regular catchy updates such as "What's blooming" or "What's hatching" may be helpful to keep residents and trail users up-to-date and interested in disseminated information.

5.0 PROPOSED TRAIL SYSTEM

Considering the potential impacts to wildlife and the opportunities for outdoor recreation, as well as the topography and vegetative communities within Twin Buttes, we suggest the "Proposed Trails," in combination with the "Subdivision Trails" already proposed by Lightner Creek Ranch, LLC (Figure 1) as the trail system for Twin Buttes.

We emphasize a narrow right of way (i.e. a single track) for the proposed trail indicated in pink (Figure 1) and that it utilizes the existing railroad grade. Because this proposed trail is located within critical deer and elk wintering habitat (see Section 2.2 and Attachment B, Wildlife Management Plan), we also underscore the need for seasonal trail closures in consultation with the Wildlife Management Team. Similarly, we recommend trails not be constructed within the natural wildlife corridor in the undeveloped area of the western portion of Twin Buttes.

We understand the trail indicated in green (Figure 1) is intended as a segment of the U.S. Highway 160 West/Lightner Creek trail system to promote multi-modal means of travel (e.g. bike commuting) and shared use; consequently, the trail will be 8-10 feet wide. The location we propose for this trail accomplishes several important tasks:

- Connects County Road 207 (Lightner Creek Road) to the Twin Buttes trail system to allow for multi-modal means of commuting (e.g. bike)
- utilizes existing disturbance along an irrigation ditch near County Road 207 (Lightner Creek Road);
- connects with the proposed community gardens to allow visitor access while serving as a possible buffer to wildlife (Figure 1);
- utilizes edge habitat rather than bisecting forest habitat;
- provides recreationists' an opportunity to be near water while protecting the riparian corridor;
- provides wildlife unobstructed access to Lightner Creek
- minimizes new disturbance;
- serve as a fire management tool.

However, we also recognize this proposed location is contingent upon the following requirements:

- permission from the Colorado Department of Transportation (CDOT) to be located in their right of way

- structures over Lightner Creek where the trail crosses it

If these requirements are not feasible, we understand rerouting portions of the proposed trail will be necessary.

6.0 LITERATURE CITED

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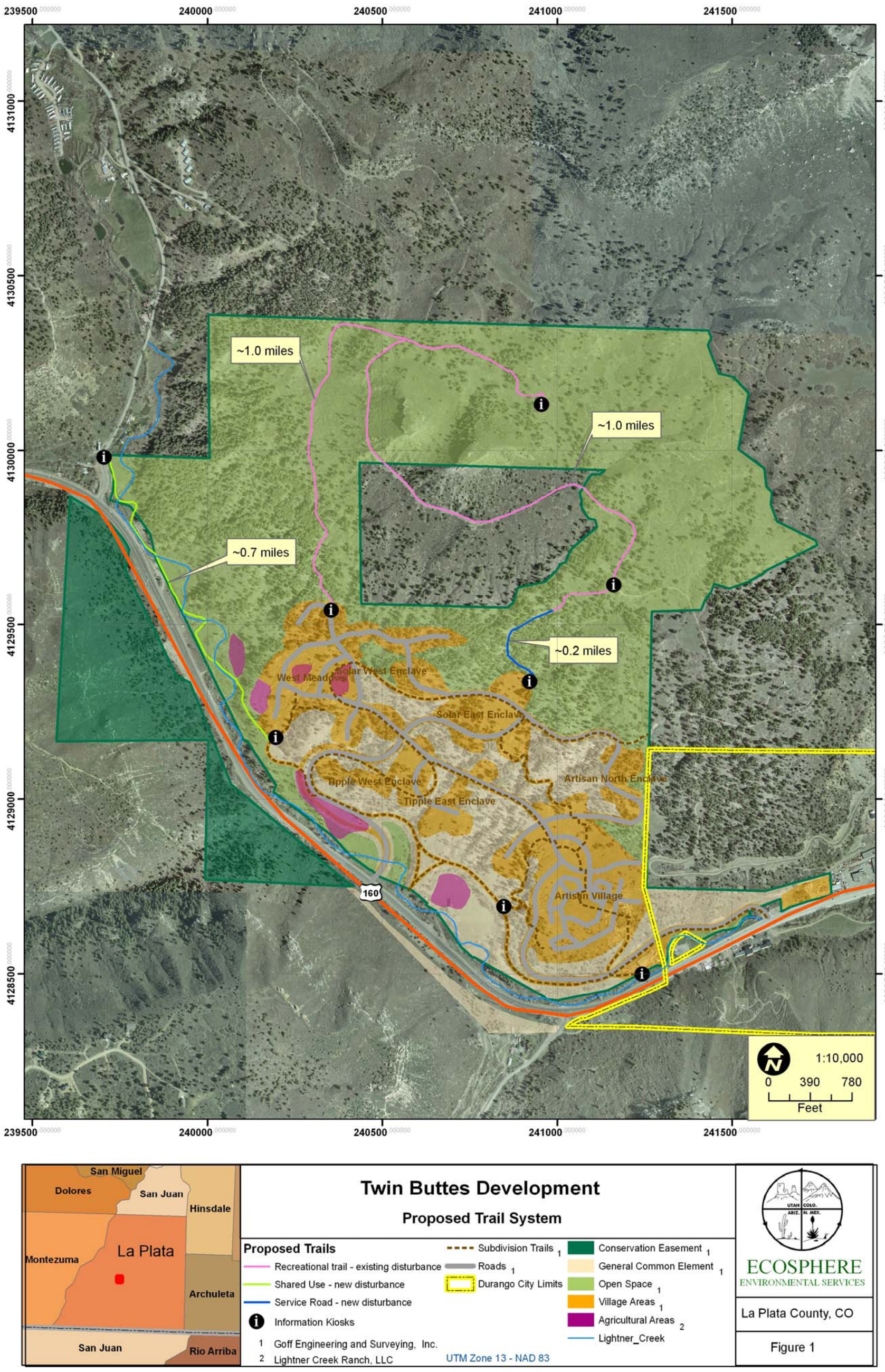

Figure 1. Proposed trail system for the Twin Buttes Development.