

Maintaining Ravine and Bluff Vegetation

A Guide to Responsible Land Management for
Property Owners and Landscape Professionals





Introduction

The ravine and bluff ecosystems near the lakeshore of Highland Park are unique and fragile landscapes which require management strategies considerate of their high ecological and aesthetic value. Thoughtful stewardship of these landscapes is the responsibility of each property owner and landscape professional who undertakes their maintenance or modification. Over the years, many north shore ravines and bluffs have received little or poor maintenance which has resulted in an influx of invasive species, a decrease in slope stability, a loss of native plant diversity, and a decline in wildlife habitat. By following the guidelines in this brochure, property owners can avoid common mistakes that degrade slope stability while enhancing property aesthetics and preserving these important natural resources. Please share this information with those who care for your ravine or bluff property.

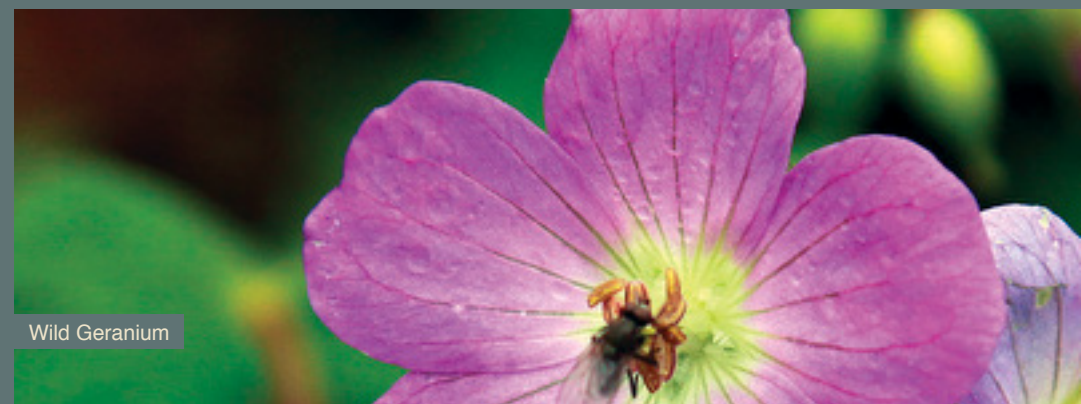
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(847) 926-1604

An Overview of the Management Process

Though each landscape is unique, all successful vegetative management projects start with a common process. If you are considering any removal or modification of vegetation on your ravine or bluff slope, follow the steps outlined below to ensure your project is properly planned, permitted, and executed:

1. Survey existing site resources
2. Develop a management plan
3. Determine if permits are required to complete work
4. Remove invasive, dead, dying, diseased, and hazardous plant species first
5. Consider removing low quality and aggressive species
6. Replant beneficial native species
7. Maintain your slope with continued monitoring and invasive species removal



Wild Geranium



Your Management Toolkit



Hepatica

The best management practices outlined below are the tools you need to get your project done right. These are proven techniques that you will need to successfully manage vegetation on your ravine or bluff slope.

Site Surveying and Planning

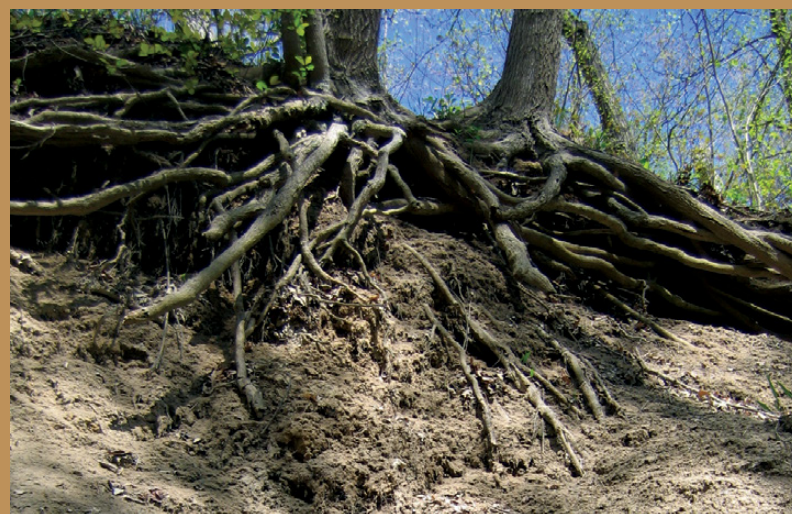
are critical first steps in managing your ravine and bluff slopes. Develop a management plan that identifies existing natural resources and outlines your proposed actions for maintenance and modification. The level of detail required will depend on the scope of your project but should include, at a minimum, a complete survey of existing trees, shrubs, herbaceous vegetation (flowering plants and grasses), and significant topographical and hydrological features within and adjacent to your project area. Clearly identify your management goals, and describe the proposed means and methods of accomplishing them. A well developed plan should answer the following questions:

- What plant species do you want to remove or modify?
- What species are important to protect?
- What species will you be planting to enhance diversity or to replace those removed?
- How will you or your contractor access the project area and dispose of any waste generated from the project?
- What is your proposed timeline for implementation?
- Will your actions require follow-up monitoring or maintenance?

If your project is limited to a small area or a few targeted management actions, you may be able to develop a management plan on your own. Larger or more complex projects may require consultation with an ecologist, landscape architect, or land management professional familiar with ravine and bluff ecosystems. Please contact the City Forester for plan requirements and resources available to assist you in developing a plan for your project, including a list of *Select Native Plants for Restoration* and a *Guide to Timing for Restoration Practices*.

The following management actions do not require a permit:

- Seasonal collection of leaves
- Prescribed burning with HPFD approval
- Pruning of shrubs
- Control of invasive herbaceous plants
- Tree pruning in accordance with International Society of Arboriculture standards
- Removal of fallen dead woody debris
- Removal of Buckthorn with stump treatment (no stump removal).
- Planting of native trees, shrubs, or other plant material.



Restoring native plants to bare soil areas will increase soil stability, reduce surface runoff and beautify property.



Permits and Special Conditions

Before undertaking any landscape work on steep slopes, contact the City Forester to review your plans and ensure that you obtain the proper permits. In order to protect these fragile ecosystems, the City of Highland Park has implemented specific permitting and building regulations that affect allowable management practices. These regulations can be found in *Article VII, Section 150.703.1 Special Regulations for the LFOZ Lakefront Density and Character Overlay Zone*, and *Article XIX, Steep Slope Zone* of the City's zoning code, both available through the City's website, www.cityhpil.com. These regulations include general restrictions on work on ravine and bluff slopes which protect existing soil and plant resources.

- Tree and shrub removal on ravine and bluff slopes requires a permit and may be allowed under certain conditions as defined in City code. Fees may apply for removal of species other than those that are dead, dying, diseased or hazardous or defined as invasive in the City's *Steep Slope Tree and Shrub Removal Guidelines*. In some cases, a replacement plan will be required.
- All work on steep slopes should avoid compacting, rutting, pitting, or disturbing soils and adjacent desirable vegetation. This may require work to occur while ground is frozen, and may restrict use of tracked or rubber tired equipment on slopes.
- All logs, branches, and organic debris generated from vegetative management actions should be removed from the slope and properly disposed of. No landscape debris may be piled or allowed to accumulate on ravine and bluff slopes at any time. **Fallen leaves from yards must not be deposited on ravine or bluff slopes.**

Tree Removal and Pruning

is often an essential step toward increasing light levels on the ground, which can support healthy growth of native grasses and wildflowers that prevent soil erosion. Management plans should consider the following when proposing tree removal:

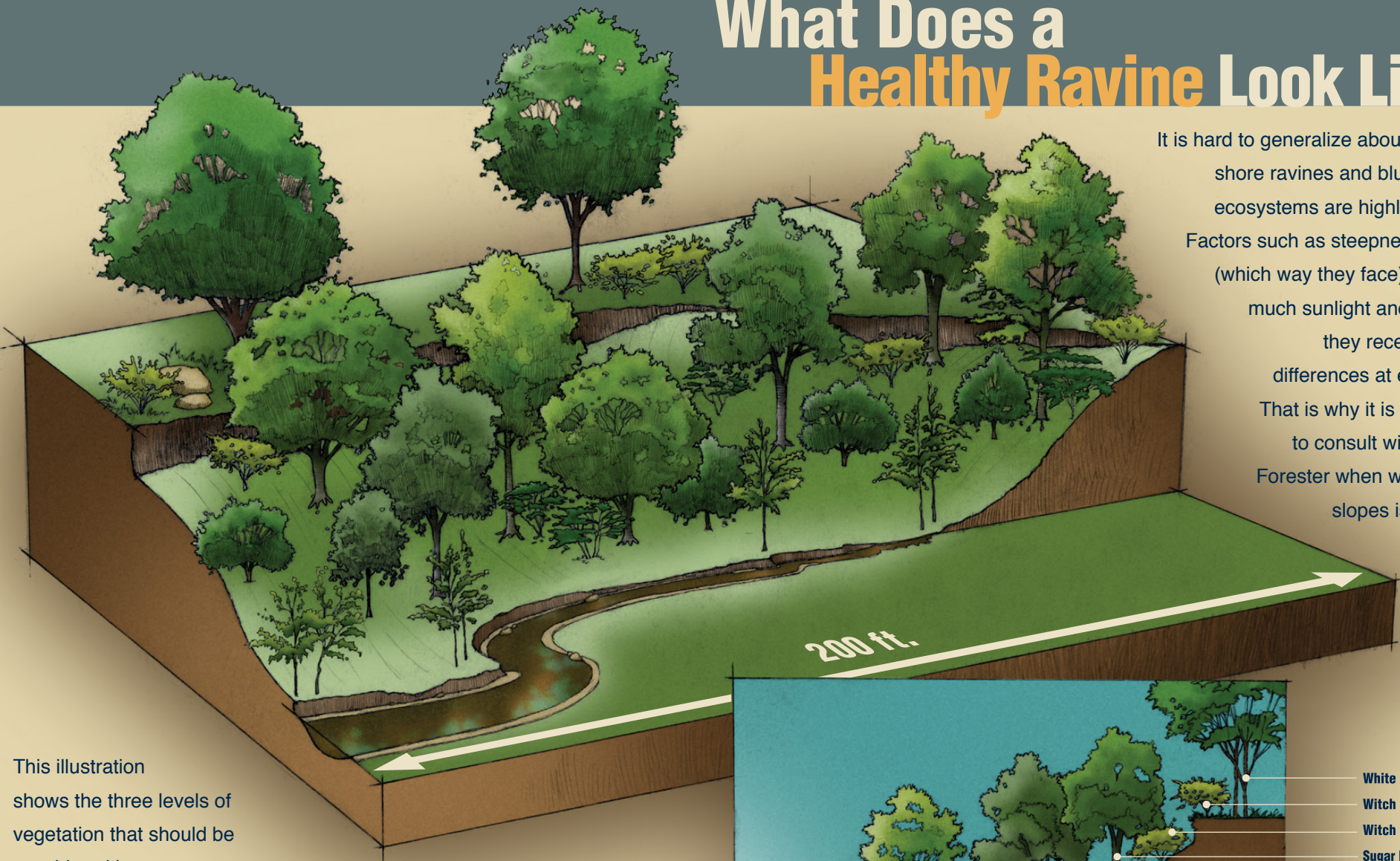
- Primary targets for removal should include dead, dying, diseased, hazardous, and trees defined as invasive in the *Steep Slope Tree and Shrub Removal Guidelines*.
- Canopy coverage should range between 40-60%, allowing for adequate sunlight levels to support flowering plants and grasses on the ground while maintaining a landscape dominated by mature trees.
- Trees on the protected species list may be considered for limited removal if canopy coverage goals cannot otherwise be met. Removal of key species is generally not allowed.
- Removal goals should promote locally appropriate native trees in a variety of size classes.
- Trees should be cut flush with the soil surface with stumps and root systems left intact.
- Prune trees according to ANSI A300 standards to ensure long-term tree health and aesthetic quality –topping trees is not allowed.



Buckthorn and other invasive species create shade (*left*) that prevents native plants from flourishing (*right*).

What Does a Healthy Ravine Look Like?

It is hard to generalize about the north shore ravines and bluffs. These ecosystems are highly variable. Factors such as steepness, aspect (which way they face), and how much sunlight and moisture they receive create differences at every turn. That is why it is necessary to consult with the City Forester when work on the slopes is planned.



This illustration shows the three levels of vegetation that should be considered in a management plan: a tree canopy of varying age and type, a shrub understory that includes native small trees and a groundcover of wildflowers, sedges and grasses that is protected and encouraged. Non-native plants such as buckthorn and garlic mustard have been removed and continue to be monitored for regrowth.



- White Oak
- Witch Hazel
- Witch Hazel
- Sugar Maple
- Red Oak
- Pagoda Dogwood
- Hop Hornbeam
- Pagoda Dogwood
- Basswood
- Blue Beech



Bellwort

How Can Removing Trees **Help** a Forest?

When we think of the north shore ravines, we often think of shady, cool places. Our ravines are characterized by ecologists as a forest community with a canopy (highest level of vegetation) dominated by Red Oak and Sugar Maple trees.

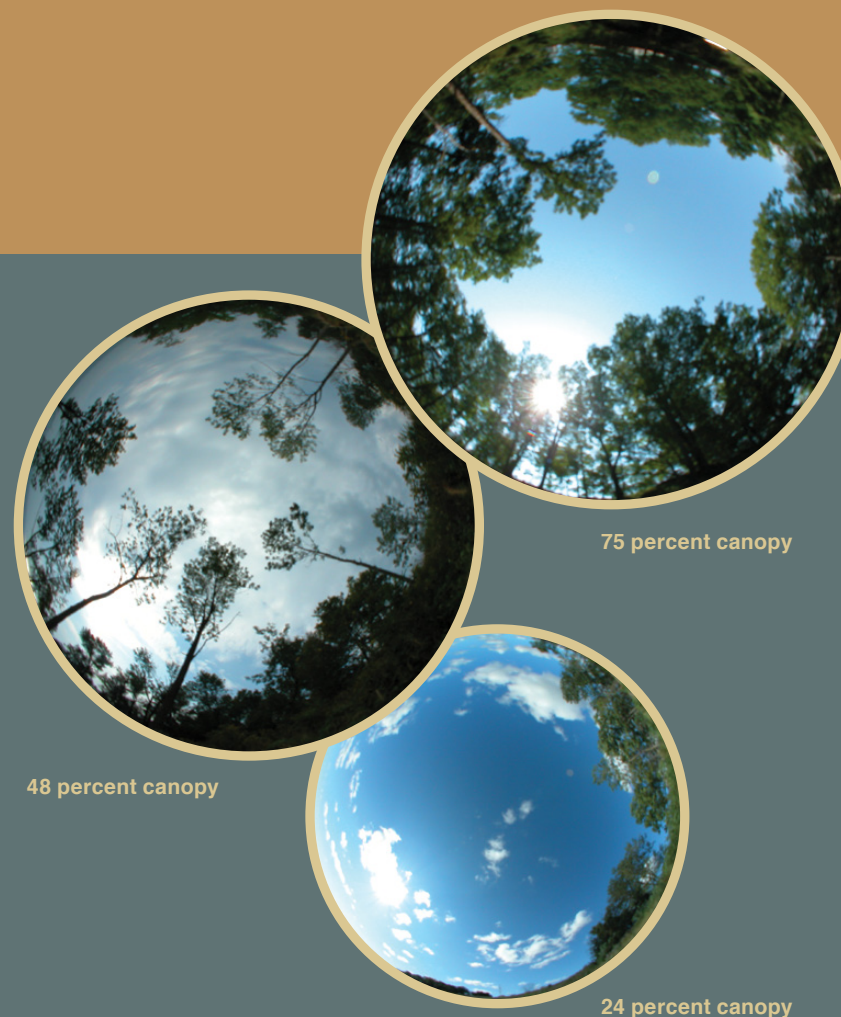
However, a healthy ravine also contains a middle layer of small trees and shrubs and also a ground floor covered with wildflowers, grasses and grass-like plants called sedges. Each is part of a complex support system protecting soil, water, creatures and each other. Sedges are especially vital because their roots knit together to hold soil in place.

Like all things living, these components need the sun's energy to survive. Ecologists are only beginning to learn how much sunlight is needed for a healthy forest, but we can see the effects of too much shade in our ravines: disappearing wildlife and wildflowers, bare soil that is prone to erosion, and the inability of mature oaks to reproduce.

In nature, plants depend on disturbance to promote new growth. Observe how young seedlings sprout up after a large tree falls and you will understand how gaps in the canopy foster a diverse forest ecosystem. Making a disturbance by removal of invasive and non-native trees is a good first step to restoring the kind of lighting our ravines need to keep them growing.



Healthy slopes are covered with grasses, sedges and wildflowers.



An indirect way to measure the sun's availability in a forest is to look up. If, in summer, the sky is blocked by leafy cover, it is likely that full sun (as measured out in the open) is cut by some percentage.

The magnitude of change from full sun to shade under tree canopy can be great. In the Midwest, a sunny mid-summer day can yield 10,000 foot candles (fc) of light in the open. Under a fully shaded canopy available light can drop to 100 fc or less. It has been estimated that 10 percent of available light is required for sedges to reproduce in woodland settings.

For guidance on tree canopy coverage, contact the City Forester at (847) 926-1604.

Fisheye lens photography courtesy of Openlands.



Mayapple



Brush and Shrub Removal

Healthy ravine and bluff woodlands should contain a substantial native understory of shrubs and young trees, while allowing for adequate sunlight levels to support flowering plants and grasses on the ground. A range of 10-15% understory coverage is considered desirable. Management plans should consider the following when proposing shrub removal:

- Removing of invasive shrubs, as defined in the *Steep Slope Tree and Shrub Removal Guidelines*, is generally encouraged on all sites.
- Removing of designated protected shrubs is generally discouraged, though may be recommended in cases where a high density of aggressive native species produces over-shading. Removal of shrubs designated as key is generally not allowed.
- Removing of shrubs by cutting to ground level (not digging roots) is required to avoid soil disturbance.
- A follow up plan to discourage regrowth is recommended. If herbicides are used, follow manufacturer's recommendations for application rates and techniques to avoid damage to non-target species. Use selective herbicides and targeted methods, such as wicking stems or painting cut stumps. Avoid broadcast spray methods.

Herbaceous Plant Removal

Healthy ravine and bluff slopes require deep-rooted herbaceous vegetation to prevent soil erosion and ensure slope stability. Management plans should promote a vigorous, diverse mix of native grasses, sedges, and wildflowers. Consider the following when proposing herbaceous plant removal:

- Removing invasive plants, as defined in the *Steep Slope Herbaceous Species Removal Guidelines*, is generally encouraged on all sites to reduce competition with native species. Removal methods should minimize impact on soil stability and adjacent desirable vegetation.
- Avoid disturbing soil when pulling herbaceous weeds – pull only shallow-rooted annual and biennial species, do not pull weeds over a large area during a single event, do not dig or grub roots.
- If herbicides are used, follow manufacturer's recommendations for application rates and techniques to avoid damage to non-target species. Use selective herbicides and targeted methods, such as wicking. Avoid broadcast spraying.
- Continue monitoring herbaceous weeds and remove them as necessary. In most cases, invasive plants require several seasons of continued management to be eradicated from a site.



Left: Invasive plants such as garlic mustard compete with native wildflowers for space and light.



Planting and Seeding

Planting and seeding native trees, shrubs, and herbaceous species is allowed on ravine and bluff slopes to enhance species diversity and coverage. In the case of tree or shrub removal work, planting may be required as part of your management plan:

- Choose deep-rooted, native perennials that are adapted to north shore ravine and bluff ecosystems. Refer to the City of Highland Park guide: “Select Native Plants for Restoration” for plants appropriate to light and soil moisture conditions on your site.
- Tree and shrub plantings should provide a range of species, mature heights, and aesthetic values such as fall color. When choosing individual trees and shrubs, remember that smaller specimens will often do better in the long run and cause fewer disturbances to the soil during planting.
- Minimize soil disturbance during planting operations – remove excess soil from the slope, mulch exposed topsoil after planting.
- Consider temporary erosion control needs when installing native seed and use degradable straw blankets or mulches which will not smother existing native vegetation. Professional hydromulching, in which a temporary protective layer of wood fibers is applied with a spray of water, can be an effective option for steep slopes.
- Water new plantings by hand, and only as necessary to ensure survival. Overwatering may increase soil erosion. Sprinkler heads should not be directed at the ravine or bluff slopes.

Additional Resources

This brochure should be considered a preliminary guide to planning vegetative management and maintenance activities within the ravine and bluff ecosystems of Highland Park. Before beginning any project that involves land management, please familiarize yourself with the most recently updated zoning ordinance. Contact the City Forester for permitting requirements and additional information, including supplemental handouts detailing common invasive species recommended for removal and native species recommended for planting.

For additional information on restoration and protection of the ravine and lakefront environment:

Alliance for the Great Lakes: www.greatlakes.org

- Ravine Restoration Toolkit

City of Highland Park: www.cityhpn.com

- Living in a Lakefront & Ravine Community
- Select Recommendations for Protecting your Ravine-Bluff Property
- Select Native Plants for Restoration

Park District of Highland Park: www.pdhp.org/hpravines

For information on native plants:

www.illinoiswildflowers.info

For information on trees and tree planting:

www.arboday.org

For information on invasive species:

www.mipn.org

www.niipp.net



Planting grasses and sedges can be an effective way to cover bare soil areas.

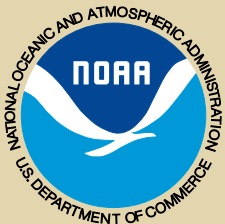


**For Information on
Planning and Permitting
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or Bluff Project:**

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