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I. INTRODUCTION

In September 2001 The Tehama County Resource Conservation District (TCRCD) conducted a noxious weed inventory at the request of the Battle Creek Watershed Conservancy. The inventory was done on the Lazy R Bahr Ranch with the cooperation of the landowner. The results of the inventory will aid the landowner in establishing goals for weed management that suit the needs of the ranch.

By establishing weed management goals, a landowner can take a proactive approach in preventing, confining or eradicating noxious weeds on their property. Noxious weeds are aggressive, non-native plant species that can have a negative impact on natural ecosystems. They can quickly invade an area and become the dominant species. Noxious weeds can:

- Reduce ecological diversity and associated wildlife habitat
- Reduce overall quantities of potential grazing forage
- Impede waterways
- Alter aesthetic value

This report was compiled with assistance from the USDA, Natural Resources Conservation Service (NRCS). TCRCD works in cooperation with the NRCS assisting landowners to manage, conserve, and improve the natural resource of Tehama County. This report is intended to serve as a guide when planning a weed management control system. The NRCS Field Office staff can offer further assistance to landowners to determine specific weed management goals and control measures.

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II. PLANNING A WEED MANAGEMENT CONTROL SYSTEM

The control of noxious weeds requires a well-designed plan. This section will discuss the process of creating a weed management plan and key points to consider along the way. In general, it is good to remember that a one-time treatment will seldom be sufficient to reduce weeds to an acceptable level, and follow-up treatment should always be anticipated. The success of any weed management system will depend on persistence and vigilance.

CONDUCT A WEED INVENTORY

Conducting a weed inventory is one of the first steps in creating a weed management plan. There are many ways to conduct an inventory, which can be extremely time consuming and require good plant identification skills. Regardless of the method used, there should be a clear definition of the type, abundance and location of existing weed populations.

Additional notes to make during the inventory include site characteristics, such as soil type, soil moisture conditions, topographic aspect and associated plant species. Documentation of events that may have provided an opportunity for the weeds to establish, such as, fire or flooding, will be useful.

IDENTIFY WEED MANAGEMENT GOALS

Once an inventory is complete, a management plan can be designed. This will begin with establishing specific goals for prevention, control or eradication of the weeds identified. When determining specific goals, it is important to consider current and future land uses, as well as desired aesthetics. Then decide which weed species may pose the most significant threat to the preferred outcome.

In addition, the feasibility of the control must be considered. For example, if the goal is strictly based on economics and increased grazing capacity, the decision may be that it is not economically viable to treat the weeds. On the other hand, if the goal is reduction of poisonous plants, an aggressive control program may be justified. Weed management goals can be as simple or complex as time and resources will allow.

EVALUATE CONTROL TECHNIQUES

Techniques used for weed control can be divided into the following categories: Prevention, Manual and Mechanical, Chemical, Biological, Grazing, and Fire Management. The most effective means of weed control will generally incorporate more than one category, which is often referred to as Integrated Weed Management.

Often, the best method for control will be the one that is most cost effective and least time consuming. However, the determination of which technique will be right for a given situation can also depend on factors such as: the time of year, the plant life cycle and potential hazards. After the decision to treat has been made, it is ideal to start on a small scale. Evaluate several control techniques to determine which will work best for the specific situation.

Prevention

Obviously, the best method for weed control is prevention. In order to prevent the invasion of noxious weeds, the first step is to understand which weeds are considered undesirable for the area. Second, be aware of the weed populations that already inhabit the landscape and the approximate boundaries of each infestation. Finally, be on the lookout for new occurrences, and the spread of existing infestations. If new or spreading occurrences are observed, try to determine the cause and take action to remedy it.

Specific measures, which will help reduce the spread of existing species, include:

- Limiting soil disturbance, as weeds will preferentially grow in disturbed soil
- Enhancing native vegetation to provide competition for potential invading species
- Reducing seed transport by limiting travel through areas that are infested

Manual And Mechanical Control

The control methods in this category generally include pulling weeds by hand, hoeing, mowing/cutting, and tilling. Manual and/or mechanical control methods can be used in areas where damage to neighboring native vegetation from herbicides or fire is a concern. However, manual and mechanical methods are generally reserved for small infestations due to the time and labor required.

Points to consider when using manual or mechanical control include:

- Many weed species are capable of re-sprouting from roots remaining in the ground or from segments of the cut plant.
- Weeds grow preferentially in disturbed areas, so minimize soil disturbance
- Machines, vehicles and equipment used should be carefully inspected so that seeds are not transported to another location.
- Clothes, especially shoes and pants, can also be carriers of weed seeds.

Chemical Control

Often chemical applications occur in conjunction with other control techniques and in most cases should not be the first method considered. Consideration should be given to negative side effects such as damage to native vegetation, water contamination, and harm to wildlife or domestic animals.

The decision to use chemicals should be made with consultation from a professional such as a county extension agent or local agricultural commissioner. They will help determine whether an herbicide application is the most desirable method for the

situation and if so, what type of herbicide to apply. As always, any application of restricted herbicides should be done by a licensed applicator.

Biological Control

Biological control involves specific organisms (generally insects), which are known to cause damage to the target plant. The organisms can be native to the area and only require a boost in population, or they can be an introduced species. Questions that should be answered when considering the integration of biological control include:

- Is there enough of the target plant to support the organism?
- Will more than one release be required?
- Will the organism cause damage to desirable native species?

As with chemical control, it is best to seek professional consultation when contemplating biological control measures.

Grazing Management

Grazing, which could also be considered a biological control, can be accomplished by cattle, sheep, or goats. The ability to control grazing is crucial for this method to be a success. Animals can degrade the existing conditions by overgrazing native plants, compacting or disturbing the soil excessively, or transporting undesirable seed to another location.

The use of grazing is a long-term commitment, as it can take several years to reach the desired level of control. Weeds must be grazed at times within their life cycle when they are most vulnerable, as well as when they are most palatable to animals. A grazing management plan can help determine where, when and how much grazing can and should be done. In most cases, grazing must be combined with another control mechanism in order to reduce or eradicate weeds effectively.

Fire Management

There are two methods that may be employed for burning; spot burning and prescribed burning. Spot burning is done on a smaller scale, while prescribed burning will cover a larger area and requires extensive planning. The entire vegetative community must be considered, as burning may promote germination of undesirable seeds. The decision to prescribed burning is often the last resort and should be designed and administered by a professional.

POST TREATMENT FOLLOW-UP

Re-Vegetation

Re-establishment of desirable vegetation is recommended as post-treatment weed control. Weeds are very aggressive and colonize disturbed sites if competition is not provided. The variety of plant chosen for re-vegetation is dependant upon factors such as soil type, available moisture, and rate of growth.

Monitor Results

Monitoring is very important to determine the effectiveness of the control measure. Weeds can often be a symptom of a problem rather than the actual problem. Monitoring will help determine if the problem, not just the symptom is being treated. For example, heavy blackberry infestations along unlined irrigation canals are a symptom of water seepage. As long as the canal seeps water, blackberries will continue to occupy the site and will require constant treatment to keep in check. If the canal were lined and the seepage eliminated the blackberries would no longer have the summer moisture needed to remain vigorous.

Monitoring can sometimes require several years to determine long-term effectiveness. As a minimum, photo monitoring should be done. Photos are best taken before and after treatment, and from year to year. Also, take them during the same time of year and from the same perspective. More detailed monitoring includes plant counts or total production (pounds per acre) of various weeds and desirable species.

III. LAZY R BAHR RANCH WEED INVENTORY AND RESULTS

In late September 2001, approximately two weeks were spent conducting a weed inventory on the Lazy R Bahr Ranch for Battle Creek Watershed Conservancy. The list of species targeted for the inventory can be seen in Appendix A and the individual field survey sheets are in Appendix B. Inventory results were mapped in the field and later digitized. The digitized map is available with a copy of this report.

PROPERTY DESCRIPTION

The Lazy R Bahr Ranch is located a few miles southwest of Mantón, California. It consists of approximately 3,200 acres of oak woodland (Figure 1). There are several homes on the northeast portion of the property, as well as horse corrals. The property is dissected by Ripley Creek, which flows seasonally, as well as the Cross Country, Union and Inskip canal. The southern portion of the Ranch encompasses intermittent stretches of the South Fork of Battle Creek. PG&E also operates a hydroelectric powerhouse on the southern boarder and uses the main ranch road for access to the site. The major land uses of the Ranch include:

- Cattle Grazing
- Hunting and Fishing Club
- Education, Recreation and Conservation

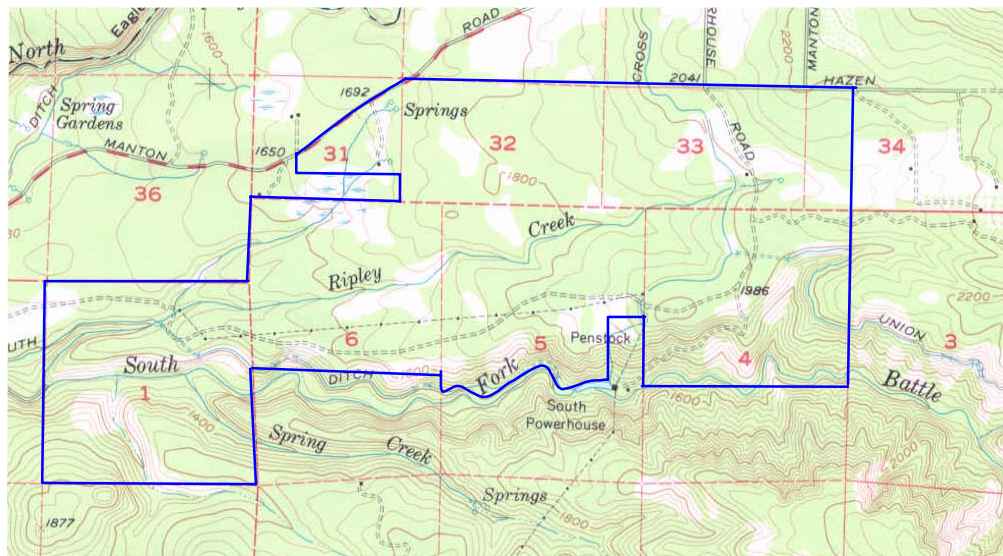


Figure 1. Lazy R Bahr Ranch boundaries. Topographic image scanned from the Mantón California US Department of the Interior Geologic Survey (1956)

INVENTORY RESULTS

Yellow Starthistle

The percentage of Yellow Starthistle in infested areas, ranged from 1 to 5%. The heaviest infestation of YST was found near the main residence and horse corrals. It was also present along the entrance to the Ranch and intermittently along the access roads south of the residence. In addition, it occurred throughout the majority of Ripley Creek. It is evident that the pattern of spreading is associated with areas that are highly disturbed by either vehicles or cattle.

Starthistle may be difficult to control or eradicate throughout most of the property unless grazing is controlled. As YST is along the main entrance, it has a greater potential to spread to other areas as vehicles pass through this area to reach the rest of the Ranch.

Medusahead

Medusahead was found throughout the property with higher degrees of infestation in areas without oaks. One of the more practical methods to control medusahead is to provide good competition with perennials and/or to utilize concentrated grazing. This can often be costly and should be weighed against the potential improvements.

Himalayan Blackberry

As is typical of the species, Himalayan blackberries were prevalent in areas that have adequate moisture year round. The infestation was from 1 to 20% along Ripley Creek, the Union Canal and in some natural spring areas.

Klamath Weed

Klamath weed was found mainly along the Union Canal. Two other sightings were noted, one on the east end of Ripley Creek, near the springs and the other along an access road to Ripley Creek. The level of infestation appeared minimal, which may easily be controlled manually.

Scotch Broom

The infestation of Scotch Broom is mainly associated with the area near the South Powerhouse and along the Union canal. The infestation has potential to spread within the ranch boundaries and should be monitored.

Arundo (Giant Reed)

There was only one cluster of Arundo noted in the northwest area of the property, near springs. It is best to control or eradicate invasive species when they exist in small numbers to prevent further spread.

**Note: The Arundo was not indicated on the associated weed inventory map due to the very small size of the infestation.*

WEED CHARACTERISTICS

This section will briefly describe characteristics and give a list of control categories appropriate for the weeds found on the Ranch. The photos presented were taken on site at the Lazy R Bahr Ranch.

Yellow Starthistle

(Centaurea Solstitialis L)

Description

Yellow starthistle (YST) is a bushy annual or sometimes biennial weed. It is a gray-green to blue-green plant covered with loose white cottony wool. It produces bright, thistle like yellow flowers with sharp spines surrounding the base.

Yellow starthistle grows to heights varying from 6 inches to 5 feet. The stems of mature plants are rigid, spreading, and typically branching from the base in open areas. It infests roadsides, waste areas, and rangelands. It is reported to infest 10-15 Million acres in California (Whitson, Burrell, Dewey, et al., 1992).



Why Invasive

Yellow starthistle produces an abundance of seed that can remain viable for several years. YST survives because of an extensive root system and its ability to out-compete the annual species during the dry summer months. YST is known to be toxic to horses.

Control Categories

- Prevention
- Manual And Mechanical Control
- Chemical
- Biological
- Grazing
- Prescribed Burning

Medusahead

(Taeniatherum Caput-Medusae)

Description

Medusahead is a winter annual native to the Mediterranean region of Eurasia. It is one of the primary range weeds in the western United States. Medusahead is 6 to 24 inches tall with a rolled leaf blade. The inflorescence is a long-awned spike that is nearly as wide as long. Mature awns are 1 to 4 inches long, stiff, and minutely barbed.



Why Invasive

Medusahead is an aggressive competitor and can quickly dominate an area in the absence of other annual or perennial grasses. It also tends to grow more abundantly in open areas with little canopy shade. It is a low-value forage species for livestock and wildlife, it has been estimated that the carrying capacity of rangeland for domestic livestock has been reduced by 75 percent after a medusahead invasion (Hortsense, 2002).

Control Categories

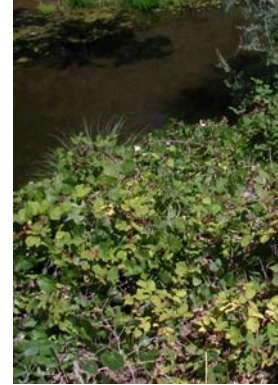
- Prevention
- Manual And Mechanical Control
- Chemical
- Grazing
- Fire Management

Himalayan Blackberry

(Rubus Discolor)

Description

Himalayan blackberry is an introduced, vigorous plant, which grows upright with long, thick canes. The canes are armed with large flattened hooked thorns. The large oval leaves are typically five-parted, with toothed edges and a pointed end. The underside of the leaves is grayish-white and hairy. Flowers have five white petals, maturing into a dark red to black edible fruit. Himalayan blackberry is widely distributed west of the Cascades. It grows in shady to sunny areas, along fences, roadsides, unlined canals, and creeks. It requires adequate moisture, and it can handle flooding.



Why Invasive

Himalayan blackberry spreads aggressively by new underground and aboveground growth of the parent plant, as well as by seed distribution. It generally establishes in disturbed areas as a dense shrub.

Control Categories

- Prevention
- Manual And Mechanical Methods
- Chemical
- Grazing
- Prescribed Burning

Klamath Weed

(Hypericum Perforatum)

Description

Klamath weed has a reddish woody stem that is 1-3 feet tall. It has green leaves and bright yellow flowers with black dots on the edges. The seeds are coated with sticky substance that helps to disperse them.



This perennial plant is found throughout the Pacific Northwest. It thrives in regions with moist winters and dry summers, and it grows best in open, disturbed sites. It is found on poorly managed pasture, fields, roadsides, and forest clearings.

Why Invasive

A plant typically produces 15,000-33,000 seeds. The sticky coating on the seeds helps in spreading seeds. The seeds remain viable in the soil for up to ten years, and in fresh water for up to five years. Seeds remain intact and viable in an animal's digestive system (Wildland, 2002). Klamath weed results in a cumulative poisoning in livestock animals.

Control Categories

- Prevention
- Mechanical
- Chemical
- Biological
- Fire Management

Scotch Broom

(Cytisus Scoparius)

Description

Scotch broom is an introduced, aggressive shrub found on the Pacific coast. It is a dark green leafed plant with erect branches up to ten feet tall. It has a yellow flower and a flat, brown seedpod with white hairs on the edges. Typically, the shrub grows well in direct sunlight and in well-drained soils. It is common along roadsides, hillsides and canals.



Why Invasive

Scotch Broom produces an abundant number of seeds, which can remain viable for a number of years. It can establish under a wide variety of soil conditions and grows throughout the year. It is very aggressive, and spreads rapidly out competing native vegetation. It grows into dense stands and presents a high fire hazard.

Control Categories

- Prevention
- Manual And Mechanical Control
- Chemical Control
- Biological Control
- Grazing Management
- Fire Management

Arundo (Giant Reed)

(Arundo Donax)

Description

Arundo is an extremely fast growing plant resembling bamboo. It can grow up to 30 feet tall. The culms are hollow and reach a diameter of 1 to 4 cm. It is one of the largest of the herbaceous grasses. The flower forms plume-like terminal panicles between March and September. Arundo grows best in well-drained soils where abundant moisture is available. It develops a fibrous root system that extends deep into the soil.



Why Invasive

Giant reed grows at a rapid rate and is a strong vegetative competitor. It can quickly become the dominant species. It out competes other vegetation for water and re-sprouts from both stems and roots.

Control Categories

- Prevention
- Manual And Mechanical
- Chemical Control
- Grazing
- Prescribed Burning

APPENDIX A

TARGET NOXIOUS WEED LIST

<u>Common Name(S)</u>	<u>Scientific Name</u>
Ailanthus/Tree-Of-Heaven	<i>Ailanthus Altissima</i>
Giant Reed/Arundo	<i>Arundo Donax</i>
Himalayan Blackberry	<i>Rubus Discolor</i>
Medusahead	<i>Taeniantherum Caput-Medusae</i>
Oleander	<i>Nerium Oleander</i>
Scotch Broom	<i>Cytisus Scoparius</i>
St. John's Wort/Klamath weed	<i>Hypericum Perforatum</i>
Tamarisk/Salt Cedar	<i>Tamarix Sp.</i>
Perennial Pepperweed/Tall Whitetop	<i>Lepidium Latifolium</i>
Yellow Starthistle	<i>Centaurea Solstitialis</i>
Hoary Cress	<i>Cardaria Draba</i>
Spotted Knapweed	<i>Centaurea Maculosa</i>
Sqarrose Knapweed	<i>Centaurea Squarrosa</i>
Pampas Grass	<i>Cortaderia Selloana</i>

APPENDIX B

FIELD WEED SURVEY SHEETS

APPENDIX C

SOILS DESCRIPTION

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