Resolution # 2007-006

RESOLUTION

BOARD OF COUNTY COMMISSIONERS
OURAY COUNTY

Re: Integrated Weed Management Plan
Cornerstone Montrose, LLC

Whereas, the Board of County Commissioners of Ouray County, Colorado ("Board"), adopted resolution #2005-020 approving the Cornerstone Montrose, LLC Amended Development Agreement; and

Whereas, pursuant to the Amended Development Agreement, paragraph 3.1.6 (Completion According to Schedule), *"a noxious weed plan shall be submitted to the County simultaneously with the first application for construction or building permit and shall be subject to approval by the County;"* and

Whereas, an Integrated Weed Management Plan ("Plan") has been submitted to Ouray County (Attachment A), and has been reviewed and approved by the Ouray County Weed Manager for its contents; and

Whereas, the Board retains authority to request a revision of the Plan if credible evidence of research indicates that such revision would be in the public's best interest; and

Whereas, the Ouray County Attorney has reviewed the Plan and has made suggestions for changes, which have been incorporated into the attached plan.

Now, Therefore, Be It Resolved, by the Board of County Commissioners of Ouray County, Colorado that the attached Integrated Weed Management Plan submitted by Cornerstone Montrose, LLC is hereby approved; and that any future amendments to the plan be brought back to the Board to be considered for approval through adoption of a resolution amending the plan.

Adopted this 5th day of March, 2007.

Board of Ouray County Commissioners
County of Ouray, State of Colorado

Attest:

_____
Don Batchelder, Chair

_____
Michelle Nauer, County Clerk and Recorder

_____
Heidi M. Albritton, Vice Chair

_____
By: Linda Munson-Haley,
Deputy Clerk of the Board

_____
Keith Meinert, Commissioner Member

CORNERSTONE INTEGRATED WEED MANAGEMENT PLAN

MONTROSE AND OURAY COUNTIES, COLORADO

February 23, 2007

Cornerstone Integrated Weed Management Plan

I. Introduction

Cornerstone is an approximately 6,000 acre residential and recreational community lying on the southern portion of Uncompahgre Plateau in Ouray and Montrose Counties. Elevations at Cornerstone range from approximately 7,000' to just under 10,000' in elevation. The community is designed to include 400 to 475 single family residential parcels, varying in size from 1/3 acre to 200 acres. The project also includes an 18 hole golf course, two clubhouses, fishing ponds, stables and a community wide hierarchical trail system that will accommodate pedestrian, equestrian, bicycle and limited motorized uses. Cornerstone has reserved approximately 3,000 acres as dedicated open space owned and managed by the Cornerstone Owners' Association free from any residential or commercial development. Additionally, the community provides approximately 2,000 acres of 'effective' open space. These lands are privately owned, but may not be fenced, built upon or vegetatively manipulated except for forest or rangeland health and restoration projects.

Cornerstone lies at the headwaters of Horsefly Creek, which flows in a southwesterly direction down from the flanks of Horsefly Ridge below Horsefly Peak and feeds the San Miguel River. On the north east side of Horsefly Ridge, Cornerstone also includes the headwaters of the West Fork of Horsefly Creek and Cottonwood Creek, both of which flow northeasterly into the Uncompahgre River.

Lands surrounding Cornerstone are largely privately owned and currently managed for livestock production, private hunting and some dispersed single family residential use. These lands have not historically and do not currently actively inventory, manage or monitor noxious weed occurrences and do not take action to prevent the spread of noxious weeds to adjacent public lands and private properties such as Cornerstone. Future development of these private lands for residential and recreational use is likely in the next few decades.

The lands that comprise today's Cornerstone have historically been managed primarily for livestock production. In addition, significant amounts of aspen have been harvested on site in clear cuts and patch cuts to supply raw wood products to the now closed Louisiana Pacific mill in Montrose County. Finally, Cornerstone and the private lands surrounding it have long provided popular private big game hunting destinations. Cornerstone no longer allows livestock grazing or hunting on its property. Cornerstone plans to treat certain aspen stands and decadent

gamble oak groves to improve overall forest health and reduce wildfire fuel loading.

II. Horsefly Weed Management Area

Cornerstone's Montrose County lands, approximately 1,500 acres, lie within the boundaries of the Horsefly Coordinated Weed Management Area ("Horsefly WMA"). The Horsefly WMA Plan was initiated in 2006 and addresses 148,303 acres located on the southwest part of the Uncompahgre Plateau, all within Montrose County. Of that area, approximately 27,500 acres are privately owned. The Uncompahgre National Forest comprises the vast majority of the Horsefly WMA acreage (over 70%) with the Bureau of Land Management managing the remainder of the land in the WMA.

The Horsefly WMA Plan is a coordinated project of the public lands managers and private land owners within the boundaries of the Horsefly WMA. These entities have collaboratively identified goals, objectives and priorities for treatment in the Horsefly WMA. The partners are committed to helping each other accomplish a Coordinated Weed Management Area Plan using Integrated Weed Management techniques.

As a newly established community, Cornerstone has recently joined as a private lands partner in the Horsefly WMA plan and will implement and participate in the Horsefly WMA Plan in the Montrose County portion of the community. Further, in adopting the Cornerstone Integrated Weed Management Plan, Cornerstone will implement weed management strategies that are consistent with and complement the Horsefly WMA Plan outside of the Horsefly WMA boundaries on the approximately 4,000 acres located in Ouray County.

III. Integrated Weed Management

The Cornerstone Wildlife Management Plan mandates that Cornerstone develop, adopt and implement a weed management plan that is "consistent with county and state regulations on invasive weed management". Further, the WMP requires that Cornerstone utilize non-toxic, non-hazardous pest, insect and weed control methods, to the extent feasible. *See Cornerstone Wildlife Management Plan ("WMA") at 3.1.8 and 3.5.3*. Thus, an integrated approach to weed management that contemplates a range of alternative methods to supplement highly toxic chemical treatment where appropriate is indicated.

As stated in the Horsefly WMA Plan, Integrated Weed Management (IWM) is a "systems approach to the management of undesirable plants. It involves the use of the best control techniques described for the target weed species in a planned, coordinated program to limit the impact and spread of the invasive species."

The federal Noxious Weed Act defines IWM as a "system for the planning and implementation of a program, using an interdisciplinary approach, to select a

method for containing or controlling an undesirable plant species or group of species using all available methods including: education, prevention, physical or mechanical methods, biological control agents, herbicide methods, cultural methods and general land management practices".

IV. Cornerstone's Weed Management Goals

Although we would all prefer to quickly eliminate noxious weeds from the landscape and be finished with it, such a goal on a 6,000 acre property with a history of intensive agricultural use is misleading and counterproductive in the short term. The State of Colorado has identified three levels of approach to noxious weed control – eradication, containment and suppression. The question of which approach to use will depend upon:

1. specific legal requirements;
2. type of weed species;
3. location, size and intensity of infestation; and
4. likely contribution to the infestation from neighboring properties.

The State of Colorado has defined its three approaches to noxious weed management. Cornerstone adopts these definitions for purposes of this Integrated Weed Management Plan:

> The term "*Eradication*" means reducing the reproductive success of a noxious weed species or specified noxious weed population in largely uninfested regions to zero and permanently eliminating the species or population within a specified period of time. Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted.
>
> The term "*Containment*" means maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely uninfested regions, where eradication activities prevail.
>
> The term "*Suppression*" means reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands. Suppression efforts may employ a wide variety of integrated management techniques.

In Colorado, specific legal mandates differ for each weed species and across different locations. All State "A" List species are legally mandated to be eradicated wherever detected statewide, in order to protect neighboring lands and the state as a whole. It is unlawful to allow known populations of State "A"

List species to produce seed. Plants are mandated to be destroyed each year prior to producing seed for these “A” List species. Currently, Cornerstone has no known “A” List species on-site.

The State of Colorado treats State “B” List species somewhat differently. State "B" List species are noxious weed species with discrete statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the State Weed Commissioner in order to stop the continued spread of these species. Cornerstone has identified several State “B” List species present on site, however none of these are species which the State of Colorado has designated for eradication in Ouray County. Additionally, the State of Colorado has not yet promulgated statewide management plans for the “B” List species currently known to occur at Cornerstone. The State has promulgated a Draft Houndstongue Containment Plan, specifying infestations throughout Ouray County as treatable via suppression. In light of the absence of any state or local legal mandate for eradication of these “B” List species, Cornerstone will choose the appropriate management approach – eradication, containment and/or suppression – based upon the other relevant factors as noted above. Cornerstone will continue to monitor for State “B” List species that are mandated for eradication by State rule or regulation. If these species are located, Cornerstone will comply with state mandates for eradication.

Finally, Cornerstone has identified a few State “C” List noxious weed species present on site. The State of Colorado classifies “C” List species as widespread and well-established noxious weed species for which control is recommended but not required by the state. Again, in the absence of a state or local legal mandate for eradication of these species, Cornerstone will approach these using the most appropriate management approach – eradication, containment or suppression – based upon the relevant site specific factors noted above, similarly to State “B” List species.

Cornerstone’s vision regarding noxious weeds and other invasive non-native species is to inventory, map, eradicate where necessary or appropriate, contain and suppress where appropriate and monitor the non-native invasive species populations that are currently established, as well as to prevent new infestations. As stated above, ultimately Cornerstone would like to eradicate noxious weeds and invasive non-native species from the Cornerstone property. We recognize, however, that weed eradication is a long range and potentially impossible goal and ultimate success is heavily influenced by the behavior of neighboring land owners and managers, which is largely outside of Cornerstone’s control.

In the interim, our overarching goal is to maximize native biodiversity and species richness across Cornerstone’s 6,000 acres and to help influence adjacent private and nearby public lands in a similar management direction. More specifically, Cornerstone adopts the following working goals in common with the Horsefly WMA Plan:

- Restore the species, age diversity and quality/productivity of native plant and animal communities by removing or preventing invasive species establishment.

- Increase and expand the Cornerstone community's and its neighbors' involvement, education and collaboration regarding invasive species management, in particular, early detection and rapid response.

- Develop and instill the understanding that Weed Prevention Best Management Practices need to be part of everyone's daily land ethic.

- Be a good neighbor and contribute to accomplishment of the objectives of Cornerstone's Integrated Weed Management Plan and the Horsefly WMA Plan.

Cornerstone will achieve these goals through the Cornerstone Integrated Weed Management Plan to be implemented in yearly Annual Operating Plans (AOP). Beginning in 2006, the Cornerstone Owners' Association will develop an AOP by December 31st of each year for implementation the following year. Each AOP will address:

- Prevention
- Detection
- Control
- Monitoring
- Restoration

Additionally, the Cornerstone Owners' Association will develop and distribute noxious weed educational materials for the use of Cornerstone owners and managers to aid and encourage their cooperation in the battle against noxious weeds.

Cornerstone Owners' Association, in all of its actions, will take advantage of the resources of the State of Colorado, Ouray and Montrose Counties and the Uncompahgre Plateau Project regarding noxious weed information and collaborative weed management opportunities.

V. Cornerstone Weeds of Concern

The State of Colorado defines a noxious weed as a species that is non-native to the state and that meets one or more of the following criteria:

a. Aggressively invades or is detrimental to economic crops or native plant communities;

b. Is poisonous to livestock;

c. Is a carrier of detrimental insects, diseases or parasites; or

d. The direct or indirect effect of the presence of the plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.

As set forth above, the State of Colorado has classified noxious weeds into three prioritized categories or lists (List A, B and C).

- List A Species: noxious weeds that have minimal distributions or have not yet been detected within the state. These species have demonstrated an ability to spread rapidly or cause significant harm. Eradication is the statutorily mandated management objective.

- List B Species: noxious weed species that have varying distribution within the state and are subject to eradication, containment or suppression. The development and implementation of noxious weed management plans designed to stop the continued spread of these species is statutorily mandated. Where possible, eradication of the species is most desirable.

- List C Species: noxious weeds that are the lowest priority because their populations are widespread throughout the state. If possible, suppression of these species is most desirable.

Cornerstone's weed inventory protocol will, at a minimum, survey for all state listed weed species. As a new landowner, Cornerstone is in the initial stages of weed inventory on its property. To date, the following invasive weed species have been found to occur on the property. Additional weed species will be classified and added to the list of weeds of concern at Cornerstone if and when identified on the property:

- Russian knapweed. State List B.
- Whitetop (Hoary Cress). State List B.
- Hounds tongue. State List B.
- Musk thistle. State List B.
- Bull thistle. State List B.
- Canada thistle. State List B.
- Common burdock. State List C.

VI. Priorities for Weed Management

Cornerstone is a large private property and comprises approximately 6,000 contiguous acres. Thus, conducting an accurate and complete noxious weed inventory and implementing effective weed management strategies requires prioritization of activities. The following priority management strategies are therefore adopted:

a. Develop Weed Prevention Best Management Practices (BMPs) by December 31, 2006 and implement BMPs on a project wide basis beginning January 1, 2007.

b. Perform the following weed inventory and mapping:

   i. Beginning 2006, annually inventory and map existing disturbed roadways (currently approximately 14 linear miles across the project), ditches, stock ponds (approximately 22), true wetlands and utility ROWs.

   ii. Inventory and map Cornerstone Homesteads as they are marketed.

   iii. No later than December 31, 2008, inventory, map and annually monitor Cornerstone Open Space Planning Areas (approximately 3,000 acres), beginning at the head of the two Horsefly Creek watersheds and progressively working down the watersheds.

c. Following inventory, annually maintain inventoried weed free areas to remain weed free.

d. Following inventory, eradicate if possible or suppress invasive species along roadsides, ditches, utility ROWs, livestock concentration areas (e.g. stock ponds and corrals), high human use areas and critical areas such as true wetlands.

e. Eradicate if possible or suppress inventoried small, isolated infestations (< $1/10^{th}$ of an acre).

f. Manage large infestations (>1/10 of an acre) through containment and suppression, working toward the ability to achieve eradication.

VII. Integrated Weed Management Strategies

The rise of the ecological threat posed by invasive and other noxious weeds has spawned a great deal of scientific research regarding treatment and eradication methodologies and a large body of literature has developed for landowners and managers from which to draw. Traditionally, weeds have been treated through high toxicity chemical broadcast spraying. This method may prove effective to help suppress or eradicate weeds, but in many circumstances may also pose a significant threat to other living organisms nearby and using the treated areas as well as to surface and ground water quality.

Thus, more recently, researchers have begun to investigate alternative methods for treating noxious weeds, including biocontrol (insect and bacteriological treatments), cultural (land management techniques), mechanical (e.g. pulling, mowing or chopping) as well as chemical treatments that are more targeted to the weeds of concern (backpack spraying and hand held wands) and that utilize chemicals that pose a lower threat to the overall environment (e.g. Milestone).

Most noxious weeds are inherently difficult to control and to date, only a few alternative methods have been proven effective for only a small number of weeds of concern. As part of its annual operating plan development, Cornerstone will annually explore the availability and efficacy of treatment methods that are less harmful to the greater environment. Cornerstone will preferentially implement those alternative methods that are appropriate and effective to control Cornerstone's weeds of concern.

An anthology of weed management actions for Cornerstone's weeds of concern is included in Appendix A hereto and will be supplemented and updated annually as new weeds are added to Cornerstone's list of weeds of concern and as new and effective treatment methodologies are discovered.

Cornerstone is a community of over 400 single family residential properties as well as community owned open spaces and recreational amenities. Each Cornerstone owner has a significant degree of autonomy regarding management of his or her private property within Cornerstone. Nevertheless, noxious weeds and their treatment pose a naturally and potentially rapidly expanding threat to the larger environment. At Cornerstone, the landowners have chosen to work together with each other through the Cornerstone Owners' Association to achieve a more controlled, coordinated and effective approach to noxious weed management thereby appropriately discharging their own individual duties concerning noxious weeds. Colorado state law places the ultimate responsibility for controlling noxious weeds on each individual property owner.

Accordingly, noxious weed control and education at Cornerstone is a function of the Cornerstone Owners' Association and will be implemented annually pursuant to an adopted Annual Operating Plan uniformly and in an organized and effective manner across all lands within the Cornerstone community. Although initial weed inventory and annual project wide treatment are functions of the Owners' Association, individual owners and residents at Cornerstone have a continuing obligation to help prevent new infestations and prevent the expansion of existing infestations by implementing Cornerstone's noxious weed BMPs. See Appendix C for a list of Cornerstone's noxious weed BMPs.

Many individuals are chemically sensitive or simply opposed to introduction of chemicals into their personal environment. Cornerstone will solicit input from its owners and residents regarding chemical sensitivity and will maintain and abide by a list of "no spray" areas within the community. See Appendix B – No Spray Areas.

Appendix A – Weed Management Strategies

Annual Updates to Weed Management Strategies

December 2006 –Early in 2006, Ouray County recommended that Cornerstone learn more about two recently introduced chemical treatment products, Milestone and Habitat and possibly introduce these chemicals into Cornerstone's weed management efforts. These new chemicals are marketed as less toxic and more persistent than chemicals historically available while being fairly cost effective. Cornerstone utilized Milestone almost exclusively during 2006 weed control. Preliminary indications following application showed encouraging results.

Appendix A
Weed Management Strategies

Jointed Goatgrass (*Aegilops cylindrical*): A non-native grass introduced from Turkey in the late 1800s. It is a winter annual, reproducing by seed and grows 15 to 30 inches tall in erect stems which branch at the base to give the plant a tufted appearance. The leaf blades are 1/8 to 1/4 inch wide (usually smooth) with small auricles at the base. The root system is shallow and fibrous. The most distinguishing characteristic is the 2 to 4 inch jointed, cylindrical, balanced seed head. Jointed goatgrass is becoming an increasing problem in the wheat land areas of eastern Colorado.

Management objective: Containment
Integrated treatment:

Chemical: Roundup @ 4-6 oz. per acre applied in late fall or early spring, where desirable perennials are to be retained. If desirable perennials are not present, treat with Roundup @ 1 pint per acre applied while plant is green and growing and prior to seed development.

Biological: None known.

Cultural: Early livestock grazing can reduce seed production.

Physical/Mechanical: Repeated tillage, prior to seed development, will reduce plant density. Fire is also effective in removing seeds. Mowing is not effective, as plants will produce below the severed stem. Mowing in the fall or after seed maturity is a primary factor in spreading contaminated seed.

Common Burdock (*Arctium minus*): An invasive biennial introduced from Europe. Upon germination it produces a rosette which winters over. The following spring it bolts and produces a tall erect stem with large basil, cordate, hairy leaves. The flowers are purple in color and approximately 1/2 to 3/4 inch in diameter. The flower head is covered with many slender hooked spines, which readily attach to clothing or passing animals.

Management Objective: Containment
Integrated Treatment:

Chemical: Best results usually obtained in rosette stage. 2,4-D @ .75 to 1 oz. water or 1 quart/acre. Roundup Ultra @ 1.5 oz/gal or 1 quart/acre; Curtail @ 1.5 oz/ gal of water or 2 quarts/acre; Crossbow @ 1.5 oz/gal of water or 2 quarts/acre. Use nonionic surfactant @ 1 quart/acre.

Biological: No effective biological agent known.

Cultural: Livestock grazing usually spreads plant distribution.

Physical/Mechanical: Hand digging as rosettes usually effective. Hand digging or burning after seed set can be effective if seeds are destroyed. Mowing is not effective. Ground tillage where done repeatedly can be effective.

Whitetop (*Cardaria draba*): A perennial member of the mustard family, it originally came from Eurasia. Growing from 1.5 feet to 3 feet the stems are medium thick and branch out toward the top of the plant. The leaves are blue-green or gray-green in color. Flowers are small and four-petaled. They are compact with many flower branches.

Management Objective: Containment
Integrated Treatment:

Chemical: Metsulfuron @ .12 to .45 oz A.E./acre, applied in spring before flower or in late fall after sufficient moisture has fallen to stimulate over-wintering growth. Picloram is not effective on this plant.

Biological: No known biological control is known.

Cultural: Grazing not effective. Heavy grazing will increase density.

Physical/Mechanical: Small infestations can be controlled with repeated plowing or digging. Cultivation and mowing are not effective control measures.

Hoary Cress (*Cardaria draba*): This plant is closely related to other species of the same genera; White Top (*C. pubescens*), and Lens-Podded Whitetop (*C. chalapa*), all of which exist and are intermingled in the Uncompahgre Valley. For purposes of this plan, all will be treated in the same manner. An introduced perennial, Hoary Cress and/or White Top are members of the Mustard Family. Flowers are small, white and born on a slender stalk about 1/2-inch in length. Leaf characteristics are unique in that the base of each leaf clasps around the stem. Roots are deep and extend both vertically and horizontally, up to 10 feet.

Management Objective: Containment
Integrated Treatment:

Chemical: Metsulfuron @ .12 to .45 oz A.E./acre, applied in spring before flower or in late fall after sufficient moisture has fallen to stimulate over-wintering growth. Picloram is not effective on this plant.

Biological: No known biological control is known.

Cultural: Grazing not effective. Heavy grazing will increase density.

Physical/Mechanical: Small infestations can be controlled with repeated plowing or digging. Cultivation and mowing are not effective control measures.

Plumeless Thistle (*Carduus acanthoides*): An invasive winter annual or biennial, which closely resembles Musk Thistle. Stems grow from 1-4 feet in height. Stem leaves are alternate and blend into the stem. Flower heads are a purplish pink, about 1-2 inches in diameter. Under the flower heads exist multiple rows of narrow, sharp spines, which support the pappus. The flower lacks the distinctive flat-topped appearance of Musk Thistle.

Management Objective: Containment
Integrated Treatment:

Chemical: See Bull Thistle

Biological: See Bull Thistle

Cultural. See Bull Thistle

Physical/Mechanical: See Bull Thistle

Musk Thistle (*Carduus nutans*): A non-native biennial. Leaves are dark green with a light green mid-rib and white margins. Flowers are solitary, 1.5 to 3 inches in diameter, purple with a distinctive flat top appearance.

Management Objective: Containment
Integrated Treatment:

Chemical: See Bull Thistle
Biological: Seedhead weevil (*Rhinocyllus conicus*)
Cultural: See Bull Thistle
Physical/Mechanical: See Bull Thistle

Yellow Starthistle: (*Centaurea solstitialis*): An introduced winter annual that is a member of the knapweed family. Flowers are bright yellow and made up of many individual flowers and bracts. Each flower is armed with a ring of stout 1-2 inch spines, which radiates around the flower head. Individual plants can produce up to 150,000 seeds per plant, with 95% seed viability. Germination begins in the late fall and continues through late summer making control efforts difficult. The leaves are largely linear, growing along the stem. The leaves and stems are covered with a silky pubescent, which gives them a silver-gray colored appearance.

Management Objective: Eradicate
Integrated Treatment:

Chemical: Picloram @ .25 A.E./acre prior to flower; Clopyralid @ .5 to .375 lb A.I./acre prior to flower. (It is noted that applications of Curtail @ 3 quarts/acre or Redeem give adequate control through the flowering stage).
Biological: Some success has been achieved with three different weevils and three different flies. Weevils include: *Bangastemus orientalis*, *Eustenopus villosus*, and *Larinus curtus*. Flies include: *Chaetorellia australis*, *Urophora sirunaseva*, and *Urophora jaculata*.
Cultural: Grazing if done prior to seed set can reduce density. Grazing after seed set can contribute to spread of the plant. Treated areas should be planted with desirable perennial grasses.
Physical/Mechanical: Hand pulling small infestations can be effective. Tillage which severs the roots below the ground, if done prior to seed set can be effective. Burning is not effective.

Russian Knapweed (*Centaurs ripens*): A competitive invasive perennial that rapidly establishes dense monocultures. It is allelopathic in nature and detrimental to the health or horses. It has a deep and complex root system which extends vertically 15 to 30 feet with many horizontal rhizomes. The roots have a characteristic black sheath, which is most evident immediately below the ground surface. Stems are erect and open, standing 1-3 feet in height. Flowers are pink to lavender approximately 1/4 to 1/2 inch in diameter.

Management Objective: Contain
Integrated Treatment:

Chemical: Curtail @ 3 quarts/acre or Redeem @ 3 pints/acre applied bud to early flower; Picloram @ .38 lb A.E./acre, pre flower and fall treatment.

Biological: No effective biological agent known.
Cultural: Reseed perennial grasses into treated areas. Grazing is not an effective method of control.
Physical/Mechanical: Repeated plowing or tillage treatment will reduce density. Burning, or mowing is not effective.

Spotted Knapweed (*Centaurea maculosa*): A biennial or short-lived perennial that has been introduced. It is an aggressive invader, which seriously degrades wildlife habitat, reduces density of desirable plants, and degrades water quality. The flower is purple to pink and is characterized by distinctive spotted bracts below the flower head. Plants grow from 8 inches to 4 feet in height. Difficult to control because of seed longevity and viability. Will germinate throughout the growing season.

Management Objective: Eradicate
Integrated Treatment:
Chemical: Clopyralid @ 3 quarts/acre in the bud to bolt stage; Picloram @ .25 lb A.E./acre while the plant is green; Dicamba @ 1 lb A.E./acre combined with 2,4-D @ 2 lbs A.E./acre, applied at bud to bolt stage.
Biological: Two seed head flies (*Urophora affinis* and *U. quadrifasciata*) are capable of reducing seed production by 50%. Root mining insects as well as fungal and bacterial pathogens have shown some promise, but overall it recommended that any biological control be combined with other integrated methods for best results.
Cultural: Sheep and goat grazing, prior to seed set, can reduce seed production. Heavy livestock grazing increases plant density. Seeding of desirable perennial grass recommended after treatment.
Physical/Mechanical: Fire, fertilizer, mowing, and ground tillage are not effective. Repeated hand pulling on small infestations will reduce seed production and plant density.

Diffuse Knapweed (*Centaurea diffusa*): An invasive biennial, annual, or short lived perennial. The plant grows from 1-3 feet in height with a deep tap root. Urn-shaped flower heads are 3/16 to 1/4 inches in diameter. Flowers are generally white, with distinctive spiny bracts. Leaves are filiform and deeply divided. Seed viability extends 10 years plus, adding complexity to control.

Management Objective: Eradicate
Integrated Treatment:
Chemical: Picloram @ .25 to .5 A.E./acre; Clopyralid @ .25 to .5 A.E./acre. Chemical control is considered the most cost effective means of control.
Biological: Twelve insects and two fungal pathogens have shown some promise, needs additional evaluation.
Cultural: Fire causes intense resprouting. Fire effective if followed up with chemical treatment. Need to seed disturbed areas with perennial grasses after treatment.
Physical/Mechanical: Small infestations can be controlled with hand pulling, if done at least three times a year for several years. Any ground disturbance causes increased plant density. Mowing, while reducing some seed production, is not a viable alternative.

Meadow Knapweed (*Centaurea debeauxii*): Meadow knapweed is a perennial growing from a woody root crown, with 20 to 40 inch tall upright stems. The rose-purple to occasionally white flowers occur in solitary, oval, or almost globe-shaped flower heads at the ends of branches. Meadow knapweed flowers from July to September. Meadow knapweed occurs in Europe as a hybrid between black and brown knapweeds.

Management Objective: Eradicate
Integrated Treatment:

Chemical: Picloram (Tordon) at 0.25 to 0.5 lb A.E./acre. Apply in late spring before or during flower stem elongation. A selective treatment that, at the suggested rate, will not damage perennial grasses.

Biological control: The seed head gall fly, Urophora quadrifasciata has had fair success on meadow knapweed.

Cultural: Meadow knapweed may be cultivated out. A fallow program prior to pasture reseeding should eliminate it.

Physical/Mechanical: Fire, fertilizer, mowing, and ground tillage are not effective. Repeated hand pulling on small infestations will reduce seed production and plant density.

Canada Thistle (*Cirsium arvense*): An introduced aggressive perennial with highly developed creeping horizontal roots. Produces from both seed and roots. Flower heads are approximately 0.5 inches in diameter and purple to white in color. Typical plant grows from 1 to 3 feet tall.

Management Objective: Containment
Integrated Treatment:

Chemical: 2,4-D@ 2 lbs A.E./acre prior to bud; Dicamba @ 2 lbs A.E./acre in rapid growth stage; Curtail plus 2,4-D @. 2 lbs- .25 A.E./acre plus 1.0-1.5 A.E./acre, respectively, prior to bud or late fall; Glyphosate @ .5 to 1.0 A.E./acre.

Biological: Canada thistle stem weevil; Canada thistle bud weevil; Thistle stem gall fly.

Cultural: Heavy grazing for sheep, goats, and horses will reduce plant density, but at the expense of damaging desirable plants. Infestations will rapidly increase when grazing is removed.

Physical/Mechanical: Hand pulling is not effective. Cultivation will reduce density if done repeatedly every three to four weeks. Tillage generally ineffective.

Bull Thistle (*Cirsium vulgare*): A non-native biennial with distinctive lance shaped leaves. Flowers are 1.5- to 2-inches in diameter, bright purple to white.

Management Objective: Containment
Integrated Treatments:

Chemical: Clopyralid + 2,4-D@ 0.2 A.I. plus 1.5 A.E./acre, respectively. Treat in spring up to flower time. Rosette stage is the best stage to treat. Chlorsulfuron @ .75 oz A.I./acre. Treat bolting to bud stage.

Biological: European weevil (*Trichosirocalus horridus*); Seedhead Fly (*Urophors stylata*).

Cultural: Seed treated disturbed sites with perennial grass seed. Grazing with sheep or goats effective in preventing plant from seeding. Cattle/horse grazing increases plant densities.

Physical/Mechanical: Mowing, pulling, or other activities prevent the plant from going to seed.

Oxeye Daisy (*Chrysanthemum leucanthemum*): An introduced perennial ornamental that is an aggressive competitor. It forms dense patches in meadows, especially in areas grazed by cattle. Flowers are white with a bright yellow center. Leaves are spiral, sessile, and narrow lanceolate. They decrease in size from the ground to the flower head, as contrasted to "Shasta Daisy" which maintains leaf size up and down the stem. Roots are shallow with numerous branched rhizomes and strong adventitious roots.

Management Objective: Contain

Integrated Treatment:

Chemical: The plant is resistant to 2,4-D based herbicides, unless used at or above the 5 lbs A.E./acre. Picloram @ 1.5 pint with 1 quart of 2,4-D/acre has been effective in some research trials. Studies also indicate that application of nitrogen fertilizers at rates of 80-plus pounds/acre is as effective as chemical herbicide treatments.

Biological: None known.

Cultural: Cattle grazing increases plant densities. Sheep and or goat grazing have limited success in reducing plant densities.

Physical/Mechanical: Hand pulling on small infestations will prevent seed production. Cultivation and mowing increase plant density.

Houndstongue (*Cynoglossum offincinale*): An introduced biennial which grows 1-4 feet in height. Leaves are alternate, up to 12 inches long and 3 inches wide. Leaves are entire, not lobed or toothed. Flowers are a deep reddish purple, small and exist on tenninal stems. The fruit is a nutlet approximately 1/3 of an inch long, with many small curved spines, which readily attach to animals or clothing. The plant contains lethal levels of alkaloids, which cause delayed liver disease in animals that consume sufficient amounts.

Management Objective: Containment

Integrated Treatment:

Chemical: Tordon 22K @ 1 oz/gallon of water or 1 quart/acre; or Clarity at the same rate. Need to add a nonionic surfactant @ 1 quart/acre, or .32 oz/gallon of water.

Biological: None know to be effective.

Cultural: See Common Burdock

Physical/Mechanical: See Common Burdock

Leafy Spurge (*Euphorbia esula*): An invasive perennial, difficult to control, and requires long term commitment to achieve control. The plant grows 16 to 22 inches in height. The flowers are small, inconspicuous and surrounded by a pair of yellow-green heart shaped bracts. Seeds are small capsules, which float on water, and are viable for 8- 10 years. The root system when established will be 26-30 feet deep, with numerous laterals.

Management Objective: Eradicate
Integrated Treatment:

Chemical: Picloram @ 1 pint/acre combined with 2 quarts of 2,4-D, applied at flowering time (Research indicates that this treatment should result in 85 % success after 4 years of successive treatment.) Picloram @ 1 quart/acre plus 1 quart of 2,4-D gives good fall treatment results. Plateau @ 10- 12 oz/acre plus crop oil (See label).

Biological: Root feeding beetles (*Aphthona*) and stem and root boring beetle (*Oberea erythrocephala*) can reduce plant vigor, but will not eradicate the plant.

Cultural: Grazing with sheep or goats can reduce seed production and stress the plant, generating more success when followed up with a chemical treatment. Heavy grazing of cattle and horses can increase plant vigor and density. Treated areas should be seeded with perennial grasses.

Physical/Mechanical: Mowing, hand pulling, and fire are all ineffective for control. Fall tillage can reduce plant density if done 2-3 time per year for 5 years.

Yellow Toadflax (*Linaria vulgaris*): An introduced perennial ornamental that is highly competitive. Flowers are bright yellow with orange centers, resembling the physical appearance of Snap Dragons. Leaves are narrow, linear, and pointed on both ends. One plant can produce up to 500,000 seeds. Seed viability is + 10 years.

Management Objective: Eradicate
Integrated Treatment:

Chemical: Herbicide success highly variable due plant genetics and soil variation. Treatment of choice involves the application of Picloram @ 1 lb A.E./acre in the fall; Dicamba @ 4 lbs A.E./acre. Use of a surfactant improves success.

Biological: Ovary feeding beetle (*Brachypterolus pucicarus*); seed capsule feeding-beetle (*Gymnaetron antirrhini*), and (*Gymnaetron netum*). Trial results are not published to date.

Cultural: Overgrazing increases plant density. Sheep can be an effective defoliator, reducing seed production. Fire is not effective. Livestock can spread seeds through the digestive system.

Physical/Mechanical: Hand pulling on small infestations, if done every year for 5-10 years can reduce plant density. Cultivation every 7-10 days for several years can be an effective but expensive control method. Failure to maintain the frequency of cultivation may increase plant density, due to reestablishment of disturbed and broken root systems.

Dalmatian toadflax (*Linaria dalmatica*): Grow up to three feet in height, leaves are spread close together on the stem and range from one to three inches long. They look like the shape of a heart. The flowers grow closer to the top of the plant. They are usually yellow with an orange center.

Management Objective: Containment
Integrated Treatment:

Chemical: Herbicides such as Metsulfuron (Escort, Ally), 3,6-dichloro-o-anisic acid (Clarity), and picloram (Tordon) have been tested and are good in helping to control it.

Biological: There are 8 different types of insects that help control Dalmation toadflax. At the time they are: 1) *Brachypterolus pulicarius*, 2) *Calophasia lunula*, 3) *Eteobalea intermediella*, 4) *Eteobalea serratella*, 5) *Gymnetron antirrhini*, 6) *Gymnetron netum*, 7) *Gymnetron linariae*, and 8) *Mecinus janthinus*.

Cultural: Young seedling have to struggle to survive in the already mature community, therefore, a healthy native plant community will slow the spread of the weed.

Physical/Mechanical: The top can be cut off the top of the plant, this will not kill it, but it will stop the seeds from forming and spreading.

Purple Loosestrife (*Lythrum salicaria*): Also known as European wand loosestrife (*Lythrum virgatum*). An introduced perennial ornamental, commonly associated with waterways. The flower is attractive, with purple flowers vertically arranged on a tall spike. Leaves are lance shaped and notched at the base. They are attached to the stalk without stems in an alternate, opposite, or whorled pattern. A single plant may produce up to 120,000 seeds per stem, which forms a seed bank that is viable for 5-10 years. Control is difficult to achieve, due to association with water.

Management Objective: Eradicate
Integrated Treatment:

Chemical: Glyphosate @ 4 pints/acre applied early to late bloom; 2,4-D @ 1-2 quarts/acre, applied early bud to early bloom; Triclopyr @ .5 to 2 Gal/acre, bud to mid-bloom.

Biological: Known agents are not effective.

Cultural: Grazing not effective.

Physical/Mechanical: Hand pulling small infestations will reduce seed production. Tillage or mowing not effective.

Scotch Thistle (*Onopordum acanthium*): Non-native biennial. Leaves and stems have a silvery, gray-green color. The flower is purple, 1-2 inches in diameter. Plant grows in dense stands and will attain heights of 6-8 feet tall.

Management Objective: Eradicate
Integrated Treatment:

Chemical: See Bull Thistle
Biological: See Bull Thistle
Cultural: See Bull Thistle
Physical/Mechanical: See Bull Thistle

Saltcedar (*Tamarix ramosissima*): Found in moist areas in the desert, is seen as a shrub or small tree to 20 feet tall with bark reddish brown. Leaves are alternate, scale-like, lanceolate (shaped like a lance-head, several times longer than wide, broadest above the base and narrowed to the apex), blue-green, sessile, up to 1/6-inch long, smooth.

Management Objective: Containment
Integrated Treatment:

Chemical: 2,4-D, Dicamba, Tordon, Triclopyr ester, and Arsenal. The herbicide Silvex has been used successfully to control saltcedar, but several restrictions have been placed on its use. The U.S. Department of Interior has totally prohibited its use on Interior lands.

Biological control: A leaf beetle, *Diorhabda elongata,* and a mealybug, *Trabutina mannipara*, that feed exclusively on saltcedar were sent to USDA-ARS quarantine labs for further study. Last summer, the beetle was approved as the first biological control agent for saltcedar. The adults and larvae feed on saltcedar leaves, repeatedly defoliating the tree.

Cultural: Saltcedar is difficult or impossible to kill by burning, drought, freezing, prolonged submersion, or repeated cutting at ground level.

Physical/Mechanical: For control using cut-stump/herbicide treatments the following steps should be followed: Cuts should be made within 2 inches (5 cm) of the ground surface; the herbicide should be applied to cut stumps within a few minutes after cutting; the entire circumference of the cambium layer should be cut and treated; sprouting foliage should be cut and treated within a year after the initial treatment.

Appendix B

No Spray Areas

-none to date- February 22, 2007

Appendix C

Noxious Weed Best Management Practices

Noxious weeds are everyone's concern. Infestations often have direct impacts on land value. Weeds on one individual's property can and, if left uncontrolled, probably will spread to neighboring property, spreading one property's problem to neighbors. Cornerstone Owners' Association performs annual monitoring and treatment of known noxious weed occurrences. Cooperation of individual property owners within Cornerstone to help identify and prevent new occurrences and to prevent the expansion of existing infestations is critical. Cornerstone has developed the following list of Best Management Practices that should become an everyday part of each Cornerstone owner's property management.

EARLY DETECTION – RAPID RESPONSE

- Learn how to identify high-priority weed species.
- Report new infestations to the Cornerstone Owners' Association as soon as they are identified.
- If you find a small isolated patch of weeds, collect the seeds or flowers in a plastic bag for disposal and pull the weeds. Report your findings and action to the Cornerstone Owners' Association.
- Inspect driveways and roadways on your Homestead before conducting maintenance to prevent spread of weeds by equipment.
- Inspect ditch and stream banks on your Homestead to prevent spread of weeds downstream by running water.
- Inspect high traffic areas monthly for the presence of noxious weeds.
- Inspect bare soil or disturbed sites frequently for noxious weeds.

PREVENTING THE SPREAD OF WEEDS

- Comply with Cornerstone's prohibition on use of non-native ornamental landscape plant material on your Homestead.
- Comply with Cornerstone's requirement to use only certified weed free forage for horses, and to the extent practical, use only certified weed free mulch for ground cover, gravel, fill material and topsoil.
- Reclaim sites after soil disturbance by using weed free seed and controlling noxious weeds as they emerge.
- Avoid transporting weed seeds on clothing, pets, horses, recreational vehicles and other equipment. Check your pet, horse, vehicles and yourself for the presence of noxious weed seed and flowers after spending time in open space or known noxious weed areas.
- Avoid driving in noxious weed infested areas with your vehicle and then traveling to unaffected areas.
- Require all construction and other equipment to be cleaned prior to coming on to your Homestead.

MAINTAIN HEALTHY PLANT COMMUNITIES

- Re-seed disturbed areas on your Homestead immediately after disturbance ends with perennial native grasses and forbs to slow the invasion of noxious weeds.
- Monitor the degree of native ground cover on your Homestead and contact the Cornerstone Owners' Association for cooperative help to invigorate native plant growth in areas where natives are struggling.