Keeping Landscapes Working

A Newsletter for Managers of Bay Area Rangelands

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A newsletter provided by the UC Cooperative Extension Natural Resources Program in the San Francisco Bay Area. This newsletter provides information to managers of both public and private rangeland. RANGELAND, which is land characterized by natural vegetation, i.e. grass, forbs and shrubs and managed as a natural ecosystem, is the predominant source of OPEN SPACE in the San Francisco Bay Area.

Sheila Barry, UCCE Bay Area Natural Resources Advisor

In This Issue

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is published through the cooperative efforts of the University of California's Santa-Clara County Cooperative Extension Service and the County of Santa Clara.

Let's Monitor!

In general public agencies often acquire open space to protect and/or enhance natural resource and cultural values. The values may include wildlife habitat, scenic vistas, watershed values and/or native biological diversity. Beyond acquisition what sort of management is needed to protect or enhance the relevant values? How can we be sure our management plan is working? How can we be sure the values we acquired a given property for are being protected and/or enhanced? We won't be sure, unless we monitor.

Both public and private land managers have heard- "You need to monitor," "Monitor!","You should have a monitoring program", "Start monitoring." Some land managers become paralysed by the questions, what, where, and how to monitor as well as how to pay for it, and do nothing. Others ignore the questions and simply collect data, reams of data that live in computers and in boxes. A few develop and implement a successful monitoring program. This issue of *Keeping Landscapes Working* answers the questions what, how, and where to monitor.

What to monitor?

Adapted from Monitoring Series Fact Sheet #4: MONITORING PRACTICE EFFECTIVENESS: WHAT, WHERE AND HOW by Melvin George, Extension Range and Pasture Specialist, Agronomy and Range Science Dept., University of California, Davis.

To answer the question, what to monitor, you really need to understand why you are monitoring. As mentioned you may have an interest in knowing whether or not your current management activities are protecting and/or enhancing relevant resources. This is called effectiveness monitoring. Effectiveness monitoring is used to assess whether a particular activity had the desired effect. Effectiveness monitoring can be used to evaluate a single practice or a group of practices applied to achieve a particular objective. When objectives are stated so that they are measurable it is not difficult to figure out what to monitor.

Continued on p. 3

Table 1

General Objective	Enhances Watersheds (water quality and quantity) by....	Measurable Objective Statement	Monitor by taking (before, during, after) photos of.....	Monitoring by estimating or measuring...	Practices
PRESCRIBED GRAZING					
Grazing management maintains adequate ground cover, rdm or stubble height in uplands	...leaving adequate ground cover in uplands to intercept rainfall, impede and filter overland flow, and reduce erosion and siltation.	Grazing will be managed so that 1000 lbs/a of residual dry matter remains at the end of the summer-fall dry season	Photograph ground surface at end of grazing season.	Ground cover Residual Dry Matter Stubble Height	Livestock Distribution Practices Prescribed Grazing Proper Stocking Rate
Grazing management prevents overuse of woody plants in riparian zones.	...leaving adequate canopy cover and root mass to stabilize stream banks.	Grazing will be managed so that livestock do not browse woody plants during the last six weeks of the growing season.	Photograph streambanks and adjacent riparian areas.	Canopy Cover	Livestock Distribution Practices Prescribe Grazing
LAND TREATMENTS					
Brush control to increase forage, improve habitat, reduce fire hazard and reduce transpiration.	...reducing transpiration, allowing grasses or other ground cover to increase so that they can impede and filter overland flow, and increase their root density to hold soil.	Brush control will reduce shrubs from 65 percent of the canopy cover to 30 percent and increase forage production from 700 lb/acre to 2000 lb/acre. Shrubs will be left in canyons and in steep rocky areas to provide cover for wildlife.	Photograph canopy cover before and after brush control. Photograph annually for first five years and every three years after that to document shrub increase following control.	Canopy Cover Ground Cover Forage Yield Forage Quality	Prescribed Fire Mechanical Chemical Seeding
Seed desired species to improve mix of desirable species and quality, lengthen green forage season, and increase ground cover.	...increasing ground cover that will impede and filter overland flow and increase root density to hold soil.	Increase forage productivity from 1200 lb/acre to 2400 lb/acre. Increase ground cover from 40 percent to 80 percent. Lengthen the green season by two weeks by providing forage earlier in the fall. Increase native grasses from 5 percent of the ground cover to 20 percent of the ground cover.	Photograph the ground surface and field to show increase in seeded species. Photograph drill rows. Photograph ground surface to show ground cover. Time stamped photos to show early green feed. Photograph successfully established native species.	Forage Yield Forage Quality Ground Cover Seedling Density Species Composition	Seeding Fertilization Brush and Weed Control
LIVESTOCK MANAGEMENT					
Cull individuals that spend large amounts of time in riparian areas or other environmentally critical areas.	...reduces time livestock spend in riparian/stream systems reducing overgrazing of streamside vegetation, trampling of streambanks and deposition of wastes in stream.	Reduce time livestock spend in riparian area from mid July to mid October by 60 percent.	Photo monitoring probably not practical	Head-days spent in riparian/stream system.. Stubble Height Trampling	Culling (Removing specific animal(s) from the herd)

Measurable Objectives

(continued from page 1)

Every objective should be measurable and describe a successful endpoint. Otherwise it is just a nebulous goal. Here is an example: "The objective of the project is to enhance the riparian corridor through the development of a riparian pasture, along with oak and willow planting."

This objective statement is not measurable. It does not define enhancement. It does not tell what constitutes successful completion of the project. You can not tell what to monitor to determine project progress and success.

Let's try to improve the above objective statement by answering some questions about the project. Enhancing the riparian corridor is a common project objective. Is it your objective to have more canopy cover, more pools, stabilized stream-banks or more streamside vegetation? Once you decide what constitutes enhancement you need to quantify the objective(s). For example, if the objective is more canopy cover you need to answer the following questions:

- *How much do I have now?*
- *How much do I want or need?*
- *How much will mother nature allow me to have? In other words, is it within the ecological potential of the site or corridor to have more of what you want or have you already reached the site's potential for canopy cover?*

Repeat these questions for each enhancement that you wish to accomplish. Once these objectives are clearly stated with measurable criteria for completion we can move on to the selection of appropriate practices for achieving objectives and we can decide what and how to monitor.

Here is an example: "***The objective of this project is to increase canopy cover from 50 percent to 75 percent and to reduce unvegetated stream-banks from 15 percent to 5 percent of the stream-bank area." Based on comparisons to other stream reaches and nearby streams we believe that this objective is within the ecological potential of this riparian/stream system.*** Now I know that I need to monitor canopy cover to determine progress toward 75 percent canopy cover and I need to monitor the area of bare soil along the stream-

ANNOUNCING .....

Grazing & Vegetation Management

Thursday, June 9th

EBMUD, Nunes Ranch

Directions:
From San Pablo Dam Road in Orinda take Castro Ranch Road east approximately 1 1/2 miles to Firegate 63-11. The Gate is just past Country View Drive on the south side. If you get to the corrals or Alhamba Valley Road you have gone too far.

Topics include:
- Plant ID
- Goatgrass and other invasive species management
- Grazing Strategics

Presentation by:
- Dr. James Bartolome, UCB
- UCB Range Ecology Graduate Students
- Sheila Barry, UCCE

No cost however space is limited.
RSVP to Sue Conde (408) 282-3119

Herbaceous Plant Measurements

Residual Dry Matter (RDM)

The amount of old plant material left on the ground at the beginning of a new growing season, residual dry matter (RDM), indicates the previous season's use and can be used to describe the health or condition of annual rangelands. An RDM evaluation is made before the first effective fall rains, usually in late September or in early October.

RDM estimates are obtained by direct clipping and weighing, comparative yield, or visual comparison with photo standards or the following descriptions (Clawson, McDougald, and Duncan 1982):

- *Light grazing leaves little or no patchy appearance. Unused plant matter averages 3 or more inches in height and small objects are masked.*
- *Moderate grazing leaves an average of 2 inches of unused plant matter, a patchy appearance, and little bare soil. Small objects will not show at a distance of 20 feet or more.*
- *Heavy grazing leaves less than 2 inches of unused plant matter. Small objects and areas of bare soil are visible at 20 feet or more.*

Mapping of RDM provides a means of recording the total amount of herbage remaining, as well as its distribution (Frost, McDougald, and Clawson 1988).

Clipped Plot: A straightforward method for measuring standing crop or residual dry matter is to clip and weigh the herbaceous material. Different species may be separated if desired. Samples may be taken, dried, and weighed for moisture correction or the whole sample may be taken in and dried before weighing.

Clipping plots are time consuming and the variability of rangeland vegetation often requires a large sample size (about 15 to 20 plots per pasture) for reasonable precision. A large number of samples may require days or weeks to collect, and may introduce error into the sampling process as vegetation matures or disappears over the sampling period. In these cases, one way of increasing efficiency is to decrease the time spent per sampling unit, even if at the expense of some precision on each observation. To increase the sample size possible for a given amount of time and money, the following technique is recommended.

Comparative yield: The comparative yield method (*Haydock and Shaw 1975)* is a variation on the clipped plot estimate. In comparative yield, five standard plots, generally square-foot plots in annual vegetation, are set up representing the range of weight likely to be encountered in the sample area.

The initial step is to walk through the unit noting the range of residual dry matter or standing crop present. Once this reconnaissance is completed, five standards are constructed by semi-permanent placement of square-foot frames. Standard 1 is set up to represent the least amount of biomass present on the area, standard 5to represent the largest amount of biomass. Standards 2, 3, and 4 are set up in a stepwise progression between standards 1 and 5. When setting up each standard plot, a similar plot is clipped and weighed to ensure that the standard plots selected represent the proper amount of standing crop or residual dry matter.

With the standards established, observers inspect them one last time. Actual sampling then begins. Sample plots are located according to a desired sampling scheme. Each sample plot is simply ranked, as it corresponds to the five standards (1-5). If a plot does not appear to fit one of the five standards, an intermediate ranking (i.e., 2.5) is given. Once observers begin ranking plots, they never go back to check the five standards

When sampling is completed, an additional 15 plots are ranked and clipped.

For example:

On a walk through Range Unit 31 of the San Joaquin Experimental Range standards 1 and 5 were selected.

A plot identical to standard 1 was clipped and weighed. The weight of the vegetation was 5 g.

A plot identical to standard 5 was clipped and weighed. The weight of the vegetation was 105 g.

Standard 3 is the middle standard which should contain vegetation weighing approximately

55g = (5 + 105) /2.

Standard 4 should contain vegetation whose weight falls in the middle of standards 3 and 5, approximately 80 g = (55 + 105) / 2

These standards will be used to rank plots in the sample area.

This sample of 15 plots should represent the range of biomass present in the sample area. These clipped samples are dried and weighed. Clipped sample weights, with their associated rankings, are used to calculate a linear regression equation with a separate regression equation calculated for each observer.

Cover

Vegetation and ground cover are often monitored. Vegetation cover indicates the ecological importance of a species in a community. Ground cover provides a good measure of site protection. Measuring cover is relatively easy and can be done consistently.

Step-point: The step-point method (*Evans and Love 1957*) provides an objective way to determine species composition and total ground cover. The method records bare soil, rock, gravel, litter, and plant species encountered under certain points selected by pacing a range site. The technique has been used to monitor the effects of grazing treatments, prescribed burns, fertilizer, and seeding projects, etc. The method allows large areas to be sampled quickly for analysis of range practices.

The procedure involves selecting a random transect through a representative part of a range site. (Note: The range site should be defined by your measurable objective. For example if you are interested in measuring effect of management practices to native grass species or invasive species, a specific range site with those species should be defined rather than a larger site which may include many range sites). A transect often consists of 100 paces, resulting in 100 points sampled. The observer establishes a step-point by lowering a sampling pin to the ground, guided by a definite notch in the toe of the boot. At each step-point the observer places the boot at a 30^0 angle to the ground to avoid disturbing plants in the immediate area and lowers the pin perpendicularly to the sole of the boot until it either hits a herbaceous plant or the ground. The first plant hit by the point of the pin near the ground is recorded.

If no plant is hit, the pin is pushed to the ground and a hit on bare soil, rock, gravel, or litter is recorded. In addition, if no plant is hit, the nearest plant to the pin is recorded. Nearest plants are determined in a forward direction (180^0 arc) going from left to right.

Total plant cover, species composition, percentage bare soil, rock, gravel, and litter are determined by dividing the number of hits on each by the total number of points sampled. Relative species composition can also be calculated from this information. For relative species composition the number of hits plus the number of nearest plant occurrence for a particular species or species group are divided by the total number of points sampled.

Source: Monitoring California's Annual Rangeland Vegetation

Monitoring Woody Vegetation

Monitoring the canopy cover of woody vegetation will enable the land manager to determine if the amount and extent of influence of brush is increasing or decreasing, providing information to assess if management objectives are being met. Recording the age class of each plant encountered will provide a measure of the overall "health" of the brush stand. A mixture of seedlings, young and mature plants,

The Line Intercept Method

In the line intercept method described by Canfield (1941) a tape is stretched between two points. Linear measurements are taken of all plants intercepted by a vertical plane running through the tape. The line has one dimension, length. Basal or canopy intercept measurements can be made. The technique is most suitable for measuring cover of shrubs and trees in mountain meadows, chaparral, and hardwood rangeland.

The procedure involves establishing a randomly located transect through a representative part of the range site. Transects are usually 100 feet to 200 feet long. Sampling begins at the zero end of the tape stretched along the transect line. The observer measures canopy from the right side or downhill side of the tape. The horizontal linear length of the plant intercepts along the line are recorded in inches by species. For shrubs and trees, measure the vertical projection of the foliar cover intercepting the tape.

The percent cover of each plant species is calculated by totaling the intercept measurements for all individuals of that species along the transect line and converting this total to a percentage by dividing by the total length of the line. Total cover measured on the transect is calculated by adding the cover percentages of all the species. This total could exceed 100 percent if the intercepts of overlapping canopies are recorded. With this method, relative species composition is based on the percent cover of the various species. Relative composition is calculated by dividing the percent cover for each species by the total cover of all plant species.

Extensions of the method involving additional measurements include sampling the degree of grazing use and the forage production. In addition, woody shrubs intercepted along the line can be classified by age and form class. Oak trees intercepted can be measured for volume and rated for mast production.

Drawbacks to the line intercept method are the lengthy amount of time required to conduct sampling; the difficulty in stretching a tape between two points in tall, dense vegetation; and measuring dense stands of single-stem herbaceous species.

The line intercept method is an acceptable technique for monitoring the effects of grazing prescriptions, prescribed burns, and wildlife habitat projects over time. The method can be used in large and small areas, and can be readily extended to include additional monitoring information for evaluation. A sample data sheet is provided at the end of this report.

Age and form classification

At the same time the line intercept method is being conducted, the age and form classification can be used to evaluate present condition by age structure, availability of browse, degree of past browsing pressure, and abundance of dead plants. The age of browse plants are classified as seedlings, young plants, mature plants, or decadent plants. Factors used to determine the age of browse include size, growth rings, branching, and bark. Simply recording the age and form class of each plant encountered will provide this valuable information.

The age classes of browse plants are characterized as follows:

Form classes of browse include a composite rating of both availability of forage and degree of hedging resulting from cropping. When shrubs are not browsed or are only lightly browsed, they will assume their natural growth form or shape. As intensity of browsing increases, the departure from normal shape becomes more striking. Continued heavy browsing year after year results in closely hedged or highlined and dead or partly dead browse plants. Degree of hedging is classed into (1) little or no hedging, (2) moderately hedged, and (3) heavily hedged. Hedging, a product of past use, should not be confused with current use.

Aerial Photos

Use of aerial photos is another popular means of assessing canopy cover of woody vegetation. By utilizing methodology similar to line intercept or dot grids, canopy cover of brush species present may be estimated. Advantages include the ability to evaluate large areas quickly and, through the use of old photos, to evaluate the stand as it existed in the past. Disadvantages of using aerial photos include the increased chance of identifying species incorrectly, errors caused by camera angle or distortion, difficulty in seeing and identifying small plants such as seedlings, and inability to assess age and form class of plants present.

Source: Monitoring California's Annual Rangeland Vegetation, UCDANR Leaflet 21486, Dec. 1990.

Guidelines for Managing

California's Hardwood Rangelands

Workshop for Owners and Managers

Sponsored by:
The Integrated Hardwood Range Management Program and the UC Berkeley Center for Forestry

General Program Objectives:
California's hardwood rangelands cover almost 10 million acres and have the highest biological diversity of any broad habitat in the state. Over 80% of these lands are privately owned, providing economic livelihood for a large number of landowners. Hardwood rangelands, also known as oak woodlands, are composed of tree overstory of various oak species, and an understory of annual and perennial grass species. This one day program is designed for owners and managers of hardwood rangelands, as well as the general public and policy makers with an interest in conservation of hardwood rangelands. The program will focus on the current state of knowledge about economic, ecological, and managerial relationships on hardwood rangelands, focusing particularly on the UC handbook, "Guidelines for Managing California's Hardwood Rangelands." All registrants will receive a copy of this handbook. The program will also discuss local and statewide hardwood rangeland conservation policy issues, and methods to develop management plans for hardwood rangeland parcels.

Thursday June 2, 2005
8:30 AM to 2:30 PM
Martinelli Conference Center
3585 Greenville Road, Livermore, CA 94550

Register on the website: http://nature.berkeley.edu/forestry/guidelines/registration.php
Registration fee: $45.00 (Early registration due before May 21, 2005); $55.00 (Received 21 or later)

8:30 -Registration
9:00 -Introduction to Guidelines for Managing California's Hardwood Rangeland
-Landscape Scale Issues in Oak Woodland Management
-Oaks and Habitats of Hardwood Rangeland
-Sustaining Oak Woodlands
- Fire Relationships
- Erosion

12:30 -Break for lunch and travel to field site
-Field Site – San Francisco Watershed Property, Ranch Road
-Field Presentations
- Regeneration
- Hardwood Rangeland & Livestock Interactions
- Wildlife Ecology and Habitats

Presentations by:

Doug McCreary, IHRMP
Greg Guisti, IHRMP
Tom Scott, IHRMP
James Bartolome, UCB
Sheila Barry, UCCE

For more information call Sheila Barry (408) 282-3106

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Measurable Objectives

(continued from page 1)

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- *How much do I have now?*
- *How much do I want or need?*
- *How much will mother nature allow me to have? In other words, is it within the ecological potential of the site or corridor to have more of what you want or have you already reached the site's potential for canopy cover?*

Repeat these questions for each enhancement that you wish to accomplish. Once these objectives are clearly stated with measurable criteria for completion we can move on to the selection of appropriate practices for achieving objectives and we can decide what and how to monitor.

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The initial step is to walk through the unit noting the range of residual dry matter or standing crop present. Once this reconnaissance is completed, five standards are constructed by semi-permanent placement of square-foot frames. Standard 1 is set up to represent the least amount of biomass present on the area, standard 5to represent the largest amount of biomass. Standards 2, 3, and 4 are set up in a stepwise progression between standards 1 and 5. When setting up each standard plot, a similar plot is clipped and weighed to ensure that the standard plots selected represent the proper amount of standing crop or residual dry matter.

With the standards established, observers inspect them one last time. Actual sampling then begins. Sample plots are located according to a desired sampling scheme. Each sample plot is simply ranked, as it corresponds to the five standards (1-5). If a plot does not appear to fit one of the five standards, an intermediate ranking (i.e., 2.5) is given. Once observers begin ranking plots, they never go back to check the five standards

When sampling is completed, an additional 15 plots are ranked and clipped.

For example:

On a walk through Range Unit 31 of the San Joaquin Experimental Range standards 1 and 5 were selected.

A plot identical to standard 1 was clipped and weighed. The weight of the vegetation was 5 g.

A plot identical to standard 5 was clipped and weighed. The weight of the vegetation was 105 g.

Standard 3 is the middle standard which should contain vegetation weighing approximately

55g = (5 + 105) /2.

Standard 4 should contain vegetation whose weight falls in the middle of standards 3 and 5, approximately 80 g = (55 + 105) / 2

These standards will be used to rank plots in the sample area.

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Cover

Vegetation and ground cover are often monitored. Vegetation cover indicates the ecological importance of a species in a community. Ground cover provides a good measure of site protection. Measuring cover is relatively easy and can be done consistently.

Step-point: The step-point method (*Evans and Love 1957*) provides an objective way to determine species composition and total ground cover. The method records bare soil, rock, gravel, litter, and plant species encountered under certain points selected by pacing a range site. The technique has been used to monitor the effects of grazing treatments, prescribed burns, fertilizer, and seeding projects, etc. The method allows large areas to be sampled quickly for analysis of range practices.

The procedure involves selecting a random transect through a representative part of a range site. (Note: The range site should be defined by your measurable objective. For example if you are interested in measuring effect of management practices to native grass species or invasive species, a specific range site with those species should be defined rather than a larger site which may include many range sites). A transect often consists of 100 paces, resulting in 100 points sampled. The observer establishes a step-point by lowering a sampling pin to the ground, guided by a definite notch in the toe of the boot. At each step-point the observer places the boot at a 30^0 angle to the ground to avoid disturbing plants in the immediate area and lowers the pin perpendicularly to the sole of the boot until it either hits a herbaceous plant or the ground. The first plant hit by the point of the pin near the ground is recorded.

If no plant is hit, the pin is pushed to the ground and a hit on bare soil, rock, gravel, or litter is recorded. In addition, if no plant is hit, the nearest plant to the pin is recorded. Nearest plants are determined in a forward direction (180^0 arc) going from left to right.

Total plant cover, species composition, percentage bare soil, rock, gravel, and litter are determined by dividing the number of hits on each by the total number of points sampled. Relative species composition can also be calculated from this information. For relative species composition the number of hits plus the number of nearest plant occurrence for a particular species or species group are divided by the total number of points sampled.

Source: Monitoring California's Annual Rangeland Vegetation

Monitoring Woody Vegetation

Monitoring the canopy cover of woody vegetation will enable the land manager to determine if the amount and extent of influence of brush is increasing or decreasing, providing information to assess if management objectives are being met. Recording the age class of each plant encountered will provide a measure of the overall "health" of the brush stand. A mixture of seedlings, young and mature plants,

The Line Intercept Method

In the line intercept method described by Canfield (1941) a tape is stretched between two points. Linear measurements are taken of all plants intercepted by a vertical plane running through the tape. The line has one dimension, length. Basal or canopy intercept measurements can be made. The technique is most suitable for measuring cover of shrubs and trees in mountain meadows, chaparral, and hardwood rangeland.

The procedure involves establishing a randomly located transect through a representative part of the range site. Transects are usually 100 feet to 200 feet long. Sampling begins at the zero end of the tape stretched along the transect line. The observer measures canopy from the right side or downhill side of the tape. The horizontal linear length of the plant intercepts along the line are recorded in inches by species. For shrubs and trees, measure the vertical projection of the foliar cover intercepting the tape.

The percent cover of each plant species is calculated by totaling the intercept measurements for all individuals of that species along the transect line and converting this total to a percentage by dividing by the total length of the line. Total cover measured on the transect is calculated by adding the cover percentages of all the species. This total could exceed 100 percent if the intercepts of overlapping canopies are recorded. With this method, relative species composition is based on the percent cover of the various species. Relative composition is calculated by dividing the percent cover for each species by the total cover of all plant species.

Extensions of the method involving additional measurements include sampling the degree of grazing use and the forage production. In addition, woody shrubs intercepted along the line can be classified by age and form class. Oak trees intercepted can be measured for volume and rated for mast production.

Drawbacks to the line intercept method are the lengthy amount of time required to conduct sampling; the difficulty in stretching a tape between two points in tall, dense vegetation; and measuring dense stands of single-stem herbaceous species.

The line intercept method is an acceptable technique for monitoring the effects of grazing prescriptions, prescribed burns, and wildlife habitat projects over time. The method can be used in large and small areas, and can be readily extended to include additional monitoring information for evaluation. A sample data sheet is provided at the end of this report.

Age and form classification

At the same time the line intercept method is being conducted, the age and form classification can be used to evaluate present condition by age structure, availability of browse, degree of past browsing pressure, and abundance of dead plants. The age of browse plants are classified as seedlings, young plants, mature plants, or decadent plants. Factors used to determine the age of browse include size, growth rings, branching, and bark. Simply recording the age and form class of each plant encountered will provide this valuable information.

The age classes of browse plants are characterized as follows:

Form classes of browse include a composite rating of both availability of forage and degree of hedging resulting from cropping. When shrubs are not browsed or are only lightly browsed, they will assume their natural growth form or shape. As intensity of browsing increases, the departure from normal shape becomes more striking. Continued heavy browsing year after year results in closely hedged or highlined and dead or partly dead browse plants. Degree of hedging is classed into (1) little or no hedging, (2) moderately hedged, and (3) heavily hedged. Hedging, a product of past use, should not be confused with current use.

Aerial Photos

Use of aerial photos is another popular means of assessing canopy cover of woody vegetation. By utilizing methodology similar to line intercept or dot grids, canopy cover of brush species present may be estimated. Advantages include the ability to evaluate large areas quickly and, through the use of old photos, to evaluate the stand as it existed in the past. Disadvantages of using aerial photos include the increased chance of identifying species incorrectly, errors caused by camera angle or distortion, difficulty in seeing and identifying small plants such as seedlings, and inability to assess age and form class of plants present.

Source: Monitoring California's Annual Rangeland Vegetation, UCDANR Leaflet 21486, Dec. 1990.

Guidelines for Managing

California's Hardwood Rangelands

Workshop for Owners and Managers

Sponsored by:
The Integrated Hardwood Range Management Program and the UC Berkeley Center for Forestry

General Program Objectives:
California's hardwood rangelands cover almost 10 million acres and have the highest biological diversity of any broad habitat in the state. Over 80% of these lands are privately owned, providing economic livelihood for a large number of landowners. Hardwood rangelands, also known as oak woodlands, are composed of tree overstory of various oak species, and an understory of annual and perennial grass species. This one day program is designed for owners and managers of hardwood rangelands, as well as the general public and policy makers with an interest in conservation of hardwood rangelands. The program will focus on the current state of knowledge about economic, ecological, and managerial relationships on hardwood rangelands, focusing particularly on the UC handbook, "Guidelines for Managing California's Hardwood Rangelands." All registrants will receive a copy of this handbook. The program will also discuss local and statewide hardwood rangeland conservation policy issues, and methods to develop management plans for hardwood rangeland parcels.

Thursday June 2, 2005
8:30 AM to 2:30 PM
Martinelli Conference Center
3585 Greenville Road, Livermore, CA 94550

Register on the website: http://nature.berkeley.edu/forestry/guidelines/registration.php
Registration fee: $45.00 (Early registration due before May 21, 2005); $55.00 (Received 21 or later)

8:30 -Registration
9:00 -Introduction to Guidelines for Managing California's Hardwood Rangeland
-Landscape Scale Issues in Oak Woodland Management
-Oaks and Habitats of Hardwood Rangeland
-Sustaining Oak Woodlands
- Fire Relationships
- Erosion

12:30 -Break for lunch and travel to field site
-Field Site – San Francisco Watershed Property, Ranch Road
-Field Presentations
- Regeneration
- Hardwood Rangeland & Livestock Interactions
- Wildlife Ecology and Habitats

Presentations by:

Doug McCreary, IHRMP
Greg Guisti, IHRMP
Tom Scott, IHRMP
James Bartolome, UCB
Sheila Barry, UCCE

For more information call Sheila Barry (408) 282-3106

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