

UNDERSTANDING WORKING RANGELANDS

Ranching Infrastructure: Tools for Healthy Grasslands, Livestock, and Ranchers

As they have been for over a century, ranchers in California are responsible for the safety of their livestock. Ranching infrastructure provides for the safety and well-being of livestock and also supports ranchers in managing their livestock in a way that benefits natural resources. This infrastructure includes ranch roads, fences, corrals and chutes for containing and handling livestock, and water systems to provide reliable, clean sources of drinking water for livestock. Some ranchers also have incidental infrastructure such as feed racks, supplement tubs, and foot baths.

Ranch roads, fencing, gates, water systems, corrals, and working scales play a key role in proper management of livestock and effective management of rangelands. Having the right infrastructure is crucial to maintain the health and safety of rancher as well as the environment.

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Photo: S. Barry.

Working rangelands are public or privately owned open space lands that are managed with livestock grazing and rancher stewardship. Their management contributes to the production of a variety of ecosystem services, including food, clean water, weed control, wildlife habitat, fire fuel reduction, carbon sequestration, pollination, aesthetic views, cultural heritage, recreational and educational opportunities, and open space conservation.

ROADS AND ACCESS

Roads are a critical component to a ranching operation, allowing ranchers to access their livestock and pastures, control livestock distribution, and manage resources. Roads range in size and condition from paved roadways to unpaved roads and trails (Barry 2012). Although ranchers often perform ranch work using horses or all-terrain vehicles (ATVs), roads are essential to access handling facilities and for feeding. Roads that provide access to handling facilities should accommodate a livestock truck or trailer and allow it to pull through or turn around from the handling area. Dirt or grassed roadways may be adequate in many locations, especially when only seasonal access is necessary. Roads should be gravel or paved where year-round vehicle access is necessary to care for livestock or to monitor and maintain resources.

FENCING

Before the invention of barbed wire in 1868, there was no effective, efficient method of fencing livestock. Wooden fences and stone walls were time-consuming to build. In addition, wood was difficult to find on western rangelands where few trees grew, and rocks for stone walls were also scarce on many rangelands. The first wire fences consisted of only one strand of smooth wire, which was often broken by the weight of cattle pressing or rubbing against it. Known as “thorny fence,” the first barbed wire fence was a double-strand design that included a sharp barb so cattle would keep their distance. Barbed wire proved to be cheaper, easier, quicker to use, and more reliable than any other fencing material. Barbed wire fencing changed the West from vast grazing lands to a land of farms and pastures, promoting widespread settlement (National Park Service n.d.).

Today on California’s rangelands, fencing is used to secure and manage livestock:

- boundary fencing secures the ranch perimeter, keeping animals on-site
- cross fencing defines pastures, distributes animals, and may be used to separate classes of animals within a herd
- exclusion fencing may be used to keep livestock away from sensitive resources



5-strand barbed wire fence. *Photo: S. Barry.*

Fencing can be permanent or temporary, and it should be appropriate for containing the species of livestock on a given site. Ranchers must comply with “lawful fence” standards as well as safety requirements for electrified fencing in the California Food and Agriculture Code.

Permanent fencing is generally constructed from steel or wood posts and wire, with the intention of maintaining the fence in place for many years. The most common type of permanent fencing is still constructed with barbed wire. Mature cattle can be contained with as few as three tightly stretched strands of barbed wire, but most barbed wire fences typically have five strands. Woven wire and field fence are used as permanent fencing to contain calves, sheep, and goats. Woven wire fencing may have barbed wire strung at the top and sometimes at the bottom to deter predators and discourage livestock from pushing on it. Barbed wire, woven wire, and field fences are typically stretched against T-posts and/or wooden posts. Fence wires must remain tight in order for a fence to be effective. Solid anchor braces or corner braces are key to ensuring that the wires remain tight and the fence stays strong. Building a livestock fence requires good materials for longevity, proper construction

suitable for grazing land, and common sense, because every fencing job is different.

Another type of permanent fence, high-tensile smooth wire, can be used for cattle, sheep, or goats, as long as the strands are appropriately spaced to contain the species. High-tensile fencing to contain beef cattle can have as few as one strand, while containing sheep requires five wires, and seven strands are needed to exclude predators such as coyotes. Most, though not all, high-tensile wires are designed to be electrified by an energizer. Electrified wire provides a small pulsing shock when livestock touch it, which deters them from touching or pushing on it. These fences should be well marked with signs that indicate the fence is electrified. Livestock are usually “fence trained” prior to their first exposure to an electric fence by confining them to a small area with electrified fencing. The animals are curious and will test the fence, experiencing a shock. Before training sheep, shear them, as their wool can insulate the shock. Animals quickly learn not to touch an electric fence, so even if the electricity is turned off, they will often still stay away from it (Nader and Drake 2006).

Temporary electrified fencing can be made of polypropylene wire, or tape or mesh with fine wires woven into it. It is typically electrified with a solar charger, and the wires are held up with fiberglass poles. The advantage of a temporary electric fence is that it is very portable and can be easily installed to achieve specific resource management goals in a given area.

Some landowners use “wildlife-friendly” fencing because of concerns for wildlife movement and safety. Wildlife-friendly fencing usually has smooth top and bottom wires that are set lower at the top and higher at the bottom to allow wildlife to pass over or under the fence without injury. Because wildlife-friendly fencing may not be completely secure for livestock, it is best used where complete containment of livestock is not critical, such as for cross-fencing or exclusionary fencing.

GATES

Most fences need a gate to provide for the movement of animals and people. Gates can be made of wire stretched from post to post, welded pipe, or prefabricated panels. Their location is not only important

for vehicle and pedestrian use but also for ease of moving livestock in and out of a pasture. For example, to assist with livestock movement, a gate placed in a corner is more effective than a gate in the middle of a long run of fence. Not all fence builders have knowledge of livestock and their movements, so working with a rancher experienced in fence design is important. Lack of gates and poorly placed gates can make working cattle difficult and stressful for the livestock and rancher. Even exclusionary fences should include gates in case animals jump into the excluded area and need to be removed. Cowboy etiquette dictates that a gate should always be left as it was found: if it’s open, leave it open, and if it’s closed, close it behind you.

CATTLE GUARDS

Cattle guards where fences cross a road function as a fence or gate to contain livestock, while creating a minimal barrier to people and/or vehicles. Typically, cattle guards are used to keep livestock from crossing roads, where opening and closing gates would be impractical. Cattle guards are usually made of steel, although other materials can be used. Bars laid in a depression perpendicular to the road are spaced at a distance that allows the animals’ legs to slip between them, but close enough so as not to interfere with vehicle movement. Most animals will not attempt to cross cattle guards.

WATER AND WATER SYSTEMS

Livestock need water daily. Drinking water requirements vary with animal size and species, and throughout the year it is based on air temperature and the water content of forage (Field and Taylor 2003). A reasonable rule is to supply 15 gallons of water per day for a cow and calf, 5 to 10 gallons per day for growing steers and heifers (Weitkamp 2006), 12 to 16 gallons per day for a horse, and 1 to 1.5 gallons per day for an ewe and lamb. More water is essential for all livestock in hot, dry weather.

Water can be provided by stock ponds, springs, or creeks. Livestock may drink directly from creeks and stock ponds, although distributing water from these sources to troughs is preferable in many cases. Springs should use a spring box to collect the water, which can then be piped to one or more troughs where livestock drink. Piping



Livestock water trough. *Photo: S. Barry.*

water to troughs provides a cleaner, healthier source of drinking water that maintains livestock performance and health (see the publication in this series *Cows Need Water, Too* (UC ANR Publication 8525 <http://anrcatalog.ucanr.edu/Details.aspx?itemNo=8525>).

When multiple pastures are developed on a single property, each pasture must have enough water available at any one time to support the number of head grazing in it. In fields with significant elevation differences, one water source may not be adequate, particularly if it is at the bottom of a slope. Livestock should not have to travel more than $\frac{1}{4}$ to $\frac{1}{2}$ mile to water in steep, rough terrain or more than 1 mile on level or gently rolling ground. Livestock may overuse a site rather than walk greater distances between water and abundant forage. Conversely, although a pasture may have forage, unless there is an adequate, reliable supply of drinking water, livestock grazing may not be feasible. The location and number of watering sources can also be used to improve livestock distribution.



Livestock working facilities with loading chute. *Photo: S. Barry.*

LIVESTOCK HANDLING FACILITIES

Livestock handling facilities are necessary for sorting, moving, and treating animals. If an animal gets sick, injured, or needs veterinary attention, ranchers need a way to safely catch and restrain individual animals. Certain herd health management practices also require animal handling (see the publication in this series *Caring for Cattle and Sheep to Provide Safe and Wholesome Meat* (UC ANR Publication 8530, <http://anrcatalog.ucanr.edu/Details.aspx?itemNo=8530>). The basic components of handling facilities include

- holding pens
- an alley between holding pens and the working area
- a crowding pen to encourage animals to move easily into the working area
- a working area, which includes a working alley and squeeze chute that restrains individual animals (fig. 1)

For transporting animals, the facilities (collectively referred to as a corral) include a loading chute, up which the animals walk from ground level into a truck.

Lick tank provides cattle with liquid supplement e.g. protein, energy or minerals. *Photo: S. Filley.*



HAY FEEDERS AND SUPPLEMENT TUBS

Some ranchers who provide supplemental feed or mineral supplementations to their animals choose to place the feed in a rack or feeder rather than putting it directly on the ground. Using a rack or feeder may reduce the waste of valuable feed from trampling, and it may also reduce the animals' risk of ingesting parasites. Supplement tubs are also used on working rangelands. These tubs contain minerals and sometimes other nutrients such as protein to supplement and improve the digestion of forage consumed. By strategically locating these supplemental feeding stations, ranchers can manipulate and improve the distribution of their cattle on the rangeland. Improved cattle distribution allows forage to be uniformly grazed, reducing over- or under-grazing of plant species and maintaining plant vigor, soil health, and animal performance.

WORKING SCALES

Cattle marketed commercially are typically sold by weight, either on the ranch or at auction. Some ranches may have working scales, which are certified by the local agriculture commissioner to ensure accuracy. Certified ranch scales allow for direct sales from the ranch, which can reduce the stress of handling cattle necessary to market

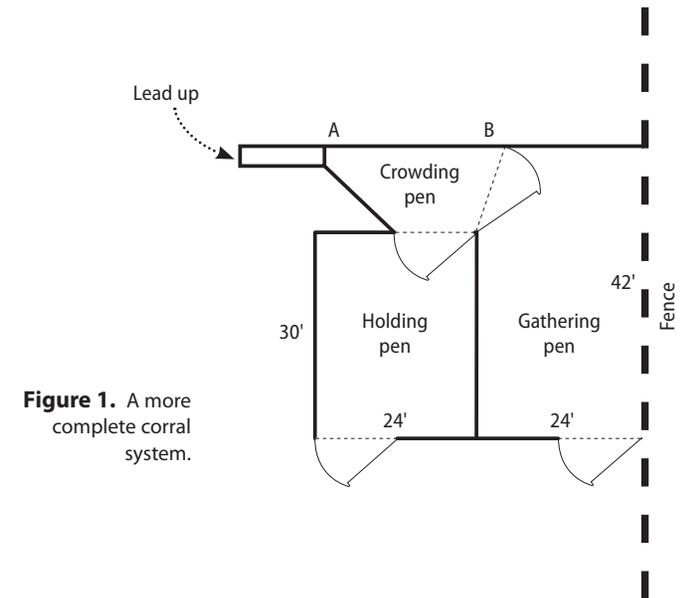


Figure 1. A more complete corral system.

them through an auction yard. Ranchers who manage someone else's cattle and get paid on the amount that the animals' gain also need access to scales. If ranch scales are not available, portable scales may be an option.

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