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UNDERSTANDING WORKING RANGELANDS

Cows Need Water, Too: Water Sources, Wetlands, and Riparian Areas

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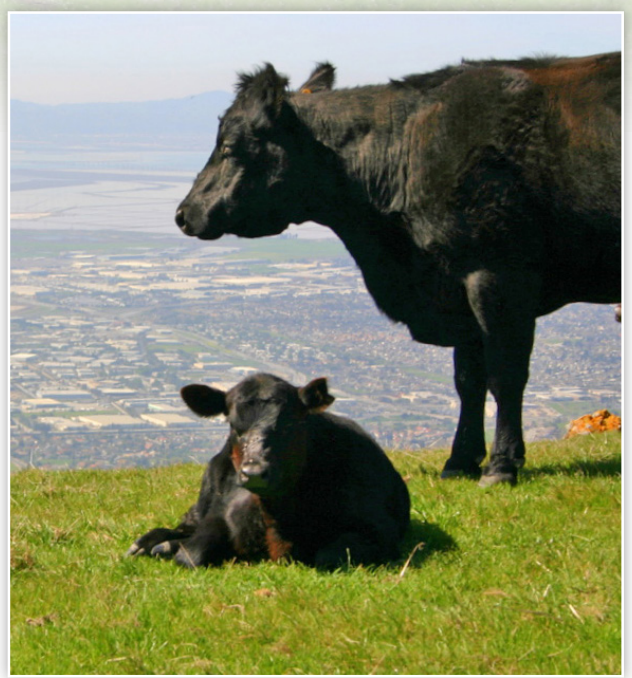
Water is essential to all living things and is the single most important nutrient for both humans and livestock, making up about 65 percent of a cow's body weight (Rastogi 2007). It's no wonder, then, that water quantity and quality is at the forefront of the minds of ranchers, regulatory agencies, and environmentalists. We all have a stake in making sure that adequate clean water is available for all beings and uses.

To ranchers and their livestock, drinking water is more important than forage, because inadequate quantity or quality of water can quickly lead to a decline in livestock health and because forage consumption depends on the availability of clean drinking water. The average cow and calf combined drink about 15 gallons of water per day, and stocker cattle (weaned calves grazing pasture or rangeland or being fed forage) drink about 5 to 10 gallons per day, although water consumption varies with temperature and other factors (Weitkamp 2006). The more cattle drink, the more they can eat. Maximizing forage consumption is especially important for growing animals like calves or



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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.

stocker cattle, since ranchers are paid per pound when they sell the animals.

Increasingly, changes in land use, impacts of drought, and predictions of future climate change mean that drinking water for livestock must be planned for and developed. Urban development, change in ownership, and land use conversion can fragment working rangelands, leaving water sources such as springs, wells, creeks, and ponds separated from pasture. In addition, water sources that have traditionally provided livestock with water have dried up during recent droughts. Those water sources and others may no longer provide water in the drier and hotter climate, as predicted by climate change models (Chaplin-Kramer and George 2013). Livestock ponds may fill but dry sooner. Productive springs that provide water to troughs and creeks may become unreliable or stop flowing. Working rangelands without water for livestock cannot be effectively managed with grazing. They may become weedy and overgrown with hazardous levels of fire fuel, and forage becomes unavailable for livestock grazing. Unmanaged, the habitat value of these rangelands is degraded for wildlife, including several special-status species (see *The Benefits of Grazing* in the UC ANR "Understanding Working Rangeland" series). Forage that is not available to livestock because of lack of livestock water impacts ranch economics and the sustainability of ranching operations (see *Ranch Economics* in the UC ANR "Understanding Working Rangeland" series).

Types of Livestock Water Sources

Ranchers are creative in finding ways to provide clean water for their livestock. They often develop springs to capture water and install miles of pipe to distribute the water to troughs. San Francisco Bay Area ranchers have not only developed thousands of springs but also have created over eight thousand ponds to capture runoff for watering their cattle on their ranches (Bay Area Open Space Council 2011). Although springs and ponds are developed by ranchers primarily for livestock drinking water, they also provide drinking water and crucial habitat for numerous kinds of wildlife, including rare species that coexist easily with livestock water use. On sites without spring water or stock ponds, creeks may be essential for watering livestock.

Besides providing drinking water and wildlife habitat, springs and the edges of ponds and creeks also produce nutritious forage. In the summer and early fall, this vegetation often remains green and is still nutritious well after most other forage is dead, brown, and has lost most nutrients. When cattle are able to graze some of this nutritious green forage along with access to water, they are more able to digest the dry, brown forage on the surrounding uplands.

Livestock Manage Non-native Plants in Wetlands

Grazing in some types of wetlands is one of the best options for managing problematic non-native plants found in those habitats. In California's Central Valley, cattle grazing controls non-native annual species such as Italian ryegrass *(Festuca perennis)* and medusahead

(Elymus caput-medusae), allowing native wildflowers such as meadowfoam (*Limnanthes* spp.), woolly-marbles (*Psilocarphus* spp.), goldfields (*Lasthenia* spp.) and tidy-tips *(Layia platyglossa)* to flourish in ephemeral wetlands or vernal pools. Cattle grazing around vernal pools also support habitat quality for vernal pool fauna such as fairy shrimp and tadpole shrimp (Marty 2005).

Grazing Helps Threatened and Endangered Amphibians

Federally listed and threatened California red-legged frogs *(Rana draytonii)* and the federally listed, endangered, or threatened California tiger salamander *(Ambystoma californiense)* benefit from grazing around stock ponds and spring habitats. The California tiger salamander Sonoma County distinct population segment (DPS) is listed as federally endangered and is listed as federally threatened in the Santa Barbara DPS and Central California DPS. The U.S. Fish and Wildlife Service (FWS) recognizes that managed livestock grazing around stock ponds can maintain a mix of open-water habitat and emergent vegetation ideal for California red-legged frogs and California tiger salamanders. California tiger salamanders actually prefer little to no vegetation around their pond habitats (Ford et al. 2013). California red-legged frog breeding habitat includes ponds or still pools in creeks, with a mix of open and vegetated areas and deep and shallow sections. Without livestock grazing, some stock ponds have quickly filled with sedges, rushes, and other plants that grow in shallow water, resulting in habitat loss. Fences built to keep livestock out of ponds are now being removed or modified to improve habitat for California red-legged frogs and California tiger salamanders in some locations (FWS 2006).

The scientists at the Fish and Wildlife Service also believe that grazing is compatible with grassland habitat of the California tiger salamander because grazing can maintain low grass height, which makes areas more suitable for California ground squirrels *(Otospermophilus beecheyi)*, whose burrows are needed by some populations of California tiger salamanders (FWS 2003). They generally approve of continuing the "existing routine ranching activities" of landowners and ranchers as potentially beneficial to California red-legged frogs (FWS 2006).

Livestock Grazing and Creeks

Livestock must have water to drink in every pasture and will not walk more than about 1 mile to drink, so more than one water source may be needed in large pastures. A distance of ½ mile between water sources is recommended for optimal range use (Weitkamp 2006). Most pastures have spring-fed troughs or stock ponds, but in some, a creek is the only place for livestock to drink.

Fencing creeks off from cattle has become a common practice to prevent heavy grazing of riparian vegetation, bank trampling, and high nutrient levels in creek water, but this "protection" method can cause serious conservation problems. Without grazing, so much dead grass can build up inside the fence that the fenced area hardly turns green when it rains and the thick mat of dead grass chokes out native plants. Weeds such as poison hemlock *(Conium maculatum),* thistles (*Cirsium* and *Carduus* spp.) and Himalayan blackberries *(Rubus armeniacus)* can also thrive in these ungrazed areas. Ungrazed dense vegetation may allow pathogens such as *E. coli* to flourish (Tate et al. 2006) and can also decay, increasing nutrients in nearby surface water (Allen-Diaz et al. 2004). Fenced-out creeks not only create weed management problems for ranchers but also cut off livestock from the best summer pasture. Fences also add a significant cost to ranching and rangeland management (see *Ranch Economics* in the UC ANR "Understanding Working Rangelands" series). They are very expensive to construct and require monitoring and regular repair and maintenance. The useful life of a fence is about 40 years. This varies with climate, and their life span can be significantly shorter in or near a riparian area where moisture deteriorates the metal, flooding deposits debris, or a tree falls on the fence. Fences along public roads are vulnerable to vehicular accidents.

Create Riparian Pastures Instead of Fencing

Riparian pastures are an alternative to building fences to exclude livestock from creeks and streams. A riparian pasture is a larger unit than just the creek or stream with a little setback. It includes a large grassy area as well as the riparian area, and rather than fencing out livestock entirely, the pasture is grazed only at certain times of year.

For a riparian pasture to work well, someone has to have the time and ability to move livestock in or out of it, and the pastures outside of the riparian area must have alternative watering sources.

On many sites, especially those with seasonal or ephemeral riparian areas, livestock can be carefully rotated through riparian pastures, with off-stream watering troughs or stock ponds providing an alternative to drinking out of the creek. By designing pastures this way, the livestock can graze the most productive pasture while keeping the riparian system healthy. Because fencing is expensive and may impact other rangeland uses, and an alternative water source is required, objectives should be clearly defined before riparian fencing is installed or a riparian pasture is created. Livestock impacts in riparian areas can be significantly reduced with off-site water development, seasonal use, or other grazing management strategies (George et al. 2011).

Rules of Thumb for Riparian Grazing

- Provide off-stream watering so livestock don't have to enter the stream to drink. If this isn't possible, provide controlled stream access points to encourage animals to drink in specific, managed locations.
- Strategically place supplements such as salt and minerals away from riparian areas to encourage grazing in upland areas.
- Don't use areas near streams to concentrate livestock. Don't locate corrals, paddocks, and feed racks near or within stream channels. Assure an adequate vegetated buffer to protect water quality.
- Keep livestock off saturated pastures near streams. Grazing on saturated stream banks can accelerate soil erosion.
- Timing of grazing should depend on seasonal weather patterns and grazing objectives. In general, avoid seasons when the streamside vegetation is the only green feed in the pasture and target the early growth stages of the undesirable grasses and weeds.
- Where ground- and shrub-nesting bird protection is a riparian pasture management objective, grazing should be closely managed during nesting season (March to July) to prevent trampling of nests, maximize the understory habitat value, and minimize foraging habitat for cowbirds (*Molothrus* spp.). The Riparian Habitat Joint Venture (2004) suggests establishing wide riparian pastures and moving cattle often to avoid the impacts of year-round grazing on nesting birds.

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