

# Outdoor Hog Production

Best Practices for Resource Conservation in the San Francisco Bay Area



## Multi-Species Grazing Systems

By Morgan Doran

Multi-species grazing is a practice of grazing multiple types of livestock or wild herbivores on the same range or pasture either at the same time or different times of the same year.

The main advantages of multi-species grazing are:

- improved forage utilization
- higher carrying capacity and
- grazing impacts that can enhance plant diversity.

Rangelands in the greater Bay Area are dominated by exotic annual grasses and forbs that have been intentionally and accidentally introduced over the past three centuries. Spanish missionaries introduced many of these annual species along with livestock knowing they were good forages and adapted to a Mediterranean environment. The annual grasses and forbs are well adapted to grazing and thrive under moderate grazing impacts. Appropriate grazing regimes on annual rangelands maintain appropriate vegetative cover, while reducing fire loads (Russell and McBride, 2003), preserving fragile habitat and species (Bartolome et al., 2014; Ford et al., 2013; Marty, 2005) and

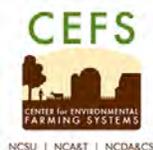
maximizing forage production and species richness (Bartolome and Betts, 2005). Grazing is an important factor in maintaining productive and diverse rangelands that support multiple species of grazing animals.



Cattle and hogs on pasture. Photo courtesy of Rob Purvis.

### Dietary Preferences in Multi-Species Grazing

Multi-species grazing can work very well when there is little dietary overlap between the different livestock species. Dietary overlap occurs when animals of the same or different species compete for the same types of vegetation. The many species of hoofed animals have a wide range of dietary preferences which are typically separated into one of three classes (Frost and Mosley, 2015): grazers, browsers or intermediate feeders.



Funding provided by the Natural Resources Conservation Service Conservation Innovation Grant  
# 86-9104-3-179

1. Grazers: Herbivores that consume large quantities of relatively low quality forage and have a limited ability to select high quality forages due to a large mouth. Cattle and horses are considered grazers.
2. Browsers: Herbivores that have a small, narrow mouth with the ability to selectively consume plants (clover and other forbs) and plant parts (tree and shrub leaves) with greater nutritional value. Goats are the most common livestock species classified as a browser.
3. Intermediate feeders: Herbivores with a mouth small enough to selectively consume high quality plants and plant parts, but with a digestive anatomy that allows consumption of low quality forages. Sheep are a common intermediate feeder.

### Including Hogs in Multi-Species Grazing

Multi-species grazing systems that include hogs may be ideal systems to consider because of dietary limitations of the hog. As described in the [Rangeland and Pasture Management](#) factsheet, hogs have a monogastric digestive system which limits their ability to digest fiber. Since fiber is a primary nutrient in forage-based feeds, hogs are not able to utilize a large percentage of the forage nutrients in pastures and rangelands. Cattle and sheep are able to utilize fiber as a nutrient because microbes in their rumen digest this fiber into chemical compounds that are converted to glucose by the animal. The dietary limitation of hogs obligates them to consume, or graze, only the higher quality forages, such as clovers and young grass shoots, with highly digestible nutrients and leave much of the lower-quality forage. A pasture or range grazing system that only includes hogs will have poor forage utilization and will require frequent mowing to mechanically break down or remove mature plant material in order to return plants to a growth stage more suitable for consumption by hogs (see the [National Forage and Grassland Curriculum](#) for more information on growth stages). Rather than spending time and resources mowing excess forage, allowing cattle or sheep access to that same pasture or paddock will make better use of the forage

resource and diversify farm returns from livestock production. Combining species of grazing livestock may even increase total productivity, as demonstrated in a research study by Sehested et al. (2004) in which heifers and sows grazing together and in sequential time periods improved weight gains for both species and increased total forage intake per acre of land.

### Implementing Multi-Species Grazing

Multi-species grazing offers many potential benefits to a farming operation, but does increase overall complexity of the production system. Giving careful attention to specific details and being observant of grazing animal behavior and impacts will improve the successful implementation of grazing multiple species of livestock.

### *Infrastructure*

One of the first considerations in planning a multi-species grazing system is the infrastructure necessary to safely contain each species. Fences, corrals and pens built for hogs are often suitable for sheep which greatly reduces the cost of additional infrastructure in a combined grazing system. Combining hog and cattle grazing will require a significant investment in infrastructure specifically



Multi-species fencing. Photo courtesy of James T. Green

for handling cattle in alleys, corrals and chutes. Pasture and range fencing for hogs will be adequate for cattle as long as the fencing is built high enough for cattle (about 54 inches). Ensuring that watering resources are secure and cannot be used by hogs to create wallows is another critical consideration.

Partitioning large grazing units into smaller paddocks with cross fencing (See factsheet on [Conservation Practices](#)) will facilitate the movement and management of grazing hogs. In grazing units where hogs are grazed with other livestock species it may be necessary to construct supplemental feed access points that permit access by hogs and exclude other species.

### **Stocking Density**

Managing the grazing impact with respect to forage utilization and stocking density is important in any grazing system, and even more important in a multi-species system. The benefits of multi-species grazing (Sehested et al., 2004) can diminish as stocking densities increase (Ruyle and Bowns, 1985), most likely due to an increase in dietary overlap as competition increases. An added complexity in managing appropriate stocking densities is the variable forage growth rates throughout a growing season. The growing season on California rangelands is primarily January through April, and April through October on irrigated pasture. When planning a multi-species grazing system, it may work best to start with lower stocking densities, especially near the beginning and end dates of the growing season, and adjust upward as forage resources allow. Refer to the [Rangeland and Pasture Management](#) factsheet for suggested hog stocking densities. Another strategy is to reserve much of the annual stocking capacity for young feeder hogs, lambs and cattle that can be bought and sold as needed rather than stocking heavily with breeding sows, ewes and cows



Interior polywire fence can be used for multi-species grazing. Photo courtesy of Silvana Pietrosevoli

that are always on the farm or ranch. This strategy requires that the farm maintain a lower number of year-round breeding animals, but a high number of feeder animals when forage resources are abundant. It will take a few grazing seasons to gain a good understanding of the grazing system and adaptive management will always be a necessity.



Hogs and chickens on pasture. Photo courtesy of Sugar Mountain Farm

### **Comingled and Sequential Grazing**

Multi-species grazing can be managed in different ways to best accommodate compatibility between species, animal handling practices and forage utilization. Livestock of different species can be comingled to graze the same grazing unit together or species can be separated to graze the same grazing unit at sequential times. Since hogs and cattle have very little dietary overlap, comingling can be effective barring any logistical challenges. Sheep may have slightly more dietary overlap with hogs than cattle, but aggressive behavior may limit their compatibility. Feeder animals may provide more flexibility in adjusting stocking densities than breeding animals, but feeder animal weight gains should be closely monitored to ensure that comingled grazing does not compromise gains. If the grazing system is better suited for sequential grazing, hogs should be grazed at a time when forages are in an earlier growth stage and have younger, more succulent leaves and shoots which are high in nutritional quality. Cattle and sheep are well adapted to consume a lower quality diet than hogs and should graze forage in stage 2 of

the growth cycle (see the [National Forage and Grassland Curriculum](#)). A prescribed, rotational grazing system will work best for grazing multiple species together or sequentially to ensure forage resources are effectively utilized and not overgrazed. Keep in mind that this sequential grazing rotation only works when forage is actively growing and will not work at times when forage is dormant or senesced. Below is one example strategy for sequential multi-species grazing:

#### Example sequential grazing strategy:

1. First give hogs access in the early growth stages (late-stage 1 to early-stage 2)
2. Remove hogs and rest pasture or range until the forage is in stage 2 of growth
3. Graze cattle or sheep which returns forages back to stage 1 of growth
4. Remove cattle or sheep until forage is ready for hog grazing (step 1)

#### Literature Cited

- Bartolome, J.W. and A.D.K. Betts. 2005. Residual dry matter impacts on water quality and biomass production. Proceeding of the University of California Sierra Foothill Research and Extension Center field day, April 21, 2005.
- Bartolome, J., B. Allen-Diaz, S. Barry, L. Ford, M. Hammond, P. Hopkinson, F. Ratcliff, S. Spiegel and M. White. 2014. Grazing for biodiversity in Californian Mediterranean grasslands. *Rangelands*. 36(5):36-43.
- Ford, L.D., P.A. Van Hoorn, D.R. Rao, N.J. Scott, P.C. Trenham and J.W. Bartolome. 2013. Managing rangelands to benefit California red-legged frogs and California tiger salamanders. Alameda County Resources Conservation District, Livermore, California.
- Frost, R. and J. Mosley. 2015. Diet selection of grazing animals. eXtension online publication, [http://www.extension.org/pages/58109/diet-selection-of-grazing-animals#.VdzKw\\_RWJia](http://www.extension.org/pages/58109/diet-selection-of-grazing-animals#.VdzKw_RWJia).
- Marty, J. 2005. Effects of cattle grazing on diversity in ephemeral wetlands. *Conservation Biology* 19:1626-1632.
- Russell W. H., and J.R. McBride. 2003. Landscape scale vegetation-type conversion and fire hazard in the San Francisco bay area open spaces. *Landscape and Urban Planning*. 64: 201-208.
- Ruyle, G.B. and J.E. Bowns. 1985. Use by cattle and sheep grazing separately and together on summer range in Southwestern Utah. *Journal of Range Management* 38(4): 299-302.
- Sehested, J., K. Sjøgaard, V. Danielsen, A. Roepstorff and J. Monrad. 2004. Grazing with heifers and sows alone or mixed: herbage quality, sward structure and animal weight gain. *Livestock Production Science* 88: 223 –238.

Banner Photo credit: Hogs and goats on pasture. Photo courtesy of Silvana Pietrosevoli .