



Water Quality Enhancement Activity – *WQL01-Biological Suppression and Other Non-chemical Techniques to Manage Brush*

ATTACHMENT A – Montana Enhancement Activity Sheet Supplement

At this time there are no insects or pathogens that are available to manage brush in Montana.

There have been some studies from Montana State University (MSU) regarding use of goats and sheep on conifers, but there is no published data at this time. Research from Arizona (Severson and DeBano 1991) suggests goat stocking rates of 0.6 to 1.0 goats per acre for short duration grazing. That study used a herd of 600 goats. Goats were more effective when grazing was combined with a March – April treatment with a Marden brush crusher. These treatments reduced forage for deer.

Debaan et al. (1997) combined sheep and/or goat grazing with liming and P fertilization to reduce brush and increase grass and legume composition of pastures. They concluded that rotational grazing with variable stocking rates provided the best opportunity to manipulate botanical pasture composition. They found grazing early and removing most of the vegetation promoted grass growth.

Hanselka et al. provide a decision-support model for integrated brush management systems.

Any biological suppression and other non-chemical techniques will not include any of the sagebrush species.

Consideration of specific wildlife and brush species will be addressed prior to implementing this enhancement with browsing animals such as goats or sheep.

References:

Dabaan, M.E., A.M. Magadlela, W.B. Bryan, B.A. Arbogast, E.C. Prigge, G. Flores, and J.G. Skousen. 1997. Pasture development during brush clearing with sheep and goats. *J. Range Manage.* 50:217-221.

Hanselka, C. W., W.T Hamilton and J.R. Conner. Integrated brush management systems (IBMS): Strategies and economics. AgriLife Extension, Texas A&M System. E-407: 10 p.

Sevesson, K.E. and L.F. DeBano. 1999. Influence of Spanish goats on vegetation and soils in Arizona chaparral. *J. Range Manage.* 44(2): 111-117.