



OFFSTREAM WATERING To Reduce Livestock Use of Watercourses and Riparian Areas

These four projects were installed between 1998 and 2000. While circumstances vary, each involves the installation of a waterer to reduce livestock use of watercourses that are not fenced. Three projects are on private land and one project is on Crown land. Funding was from the Ministry of Environment, Kamloops Stock Association (with matched funding from the Beef Cattle Industry Development Fund) and the landowners. Project planning and installation assistance was from the landowners, the Ministries of Agriculture (author) & Environment (Barb John), and from Ducks Unlimited (Ken Johnson).

Why Offstream Watering ?

Two reasons for considering offstream livestock watering are:

- To provide water that is reliable, of good quality, and easily accessible
 - for winter, this is a frost-free waterer, properly sited, with good footing
 - for summer, this is a waterer, properly sited, with good footing
- To reduce the impact (or risk of impact) that livestock may cause by having direct access to a watercourse
 - impacts (or risks of) are moved from the watercourse to the more desirable and manageable location chosen for the waterer

Impact concerns will relate to the type of watercourse, the presence of fish, the downstream use of the water, and the livestock use (livestock density, duration and timing of use). For instance, winter feeding sites may have more risk of impacts to a watercourse than a grazing area on rangeland.

While the first thought in water quality and riparian protection may be to fence the watercourse from livestock, this may not be a necessary nor appropriate solution. In some cases fencing may not be practical. Instead, choose an appropriate offstream water system, properly site and install it. After using it for some time, a decision can be made if the site and conditions warrant fencing. A temporary barrier to the watercourse may also be an option.

What was the Goal of These Projects ?

These projects were initiated to document locally the success offstream livestock watering could have in reducing livestock use of watercourses that were not fenced.

Site #1: South Thompson River

- Summer Grazing and Winter Feeding Site
- Propane-Heated Waterer



Wolf Ranch. This site is a post-calving area for approximately 150 cow-calf pairs and is used from late-February to late-April. Summer grazing may also occur. Livestock have easy access to the South Thompson River for water in two or three locations which all have good footing. The rest of the riverbank is too steep for livestock to use as river access.

The waterer was installed about 400 feet back from the river on an existing trail to the river. It is a 'typical' waterer-on-concrete-pad installation of a Ritchie Model #5 cattle waterer. A water line was trenched approximately 1,000 feet from the ranch water system to the waterer. Electrical power was also this distance away so the propane-heated option was chosen to provide frost protection. The system was installed in November 1998 with the assistance of Wolf Ranch.

The feeding locations are 200 to 600 feet back from the waterer (600 to 1200 feet from the river). By mid-April the grass 'greens up' and livestock are attracted towards the river as shown below. Before 'green up' use of the waterer is approximately 95% but is reduced to 65% as livestock graze near the river.

With the installation of the waterer, overall livestock use of the river is estimated to be reduced by 80%.

Wolf Ranch Site along the South Thompson River



This picture was taken in Mid-April after morning feeding when approximately 65% continue to use the waterer. Note some livestock are grazing on the lower bench and watering at the river.

Site #2: North Thompson River

- Fall Grazing and Winter Feeding Site
- “Earth-Heated” Waterer

Puhallo Ranch. This site is a fall grazing and winter feeding area for approximately 175 cows. The area was already fenced from the river with gates used to allow river access. Due to its riparian importance, and to observe livestock response, this site was chosen to demonstrate a unique, ‘earth-heated’ waterer. More information on this trough is on page 3 of Factsheet #590.308-3.

The waterer is installed between two fields, 850 feet back from the riparian fence. It is approximately 2000 feet to the main ranch site for the water and electricity. This distance could reasonably be trenched for the water line; it is too far to run electricity. The system was installed in November 1999 with the assistance of the Puhallo Ranch.



The waterer consists of three, 8 foot long connected tanks set 6 feet in the ground using ‘earth-heat’ for frost protection. The water supply is connected to the centre tank; the two outside tanks are drinkers, rated for up to 200 cows. No concrete pad is used around the waterer; some sites may require ground reinforcement. The waterer goes by the trade name “*Thermo-Sink*” and is manufactured in Alberta. A one-drinker version is also available for 100 cows.

In the first winter of use, some surface icing on the drinking bowls occurred but was easily managed.

Puhallo Ranch Site along the North Thompson River



Forage fields are grazed in fall and winter feeding occurs in the lower field.
Note the vegetated riparian area.
A Kamloops City domestic water intake is downstream of this site.

Site #3: Campbell Creek

- Fall Grazing and Winter Feeding Site
- “Flow-Thru-Heated” Waterer



Frolek Cattle Co. This site is a fall grazing and winter feeding area for approximately 250 cows along Campbell Creek (south of Kamloops). Access for watering is by a few low-bank areas; the remainder of the creek is mainly high-bank. Although there was a possibility of gravity flow to a waterer, it was more reliable to pump from a shallow well. Electricity was available approximately 180 feet away and groundwater was within 4 to 6 feet.

A Ritchie WaterMaster 90 waterer (with flow-through) was installed on a concrete-pad. Instead of using an electrical heat element for frost protection, water is continuously pumped through the waterer with flow back to a rock pit near the well. Heat loss from the waterer is balanced with heat gain from the circulating water. The well pump is wired with a timer that is set for 8am on and 5pm off. The trough was installed so it would self-drain when the pump is shut off. The pumped flow rate was selected considering the waterer insulation and dimensions and local climate norms (refer to Factsheet 590.305-6).

The feeding area runs long and narrow along the creek. The waterer is located approximately 1/3 the distance from one end of the site and is approximately 250 feet from the creek, centered between the creek and the upper side of the field.

The system was installed in Oct 2000 with the assistance of Frolek Cattle Co. Initial use indicated the flow-through exit point of the trough requires modification to screen floating material such as waste feed, etc.

Frolek Cattle Co. Site along Campbell Creek



Forage fields are grazed in the fall and also used as a winter feeding area. Campbell Creek is along the vegetated strip at top of photo. Note the rail-fenced well head.

Site #4: Laurie Guichon Memorial Grasslands Interpretive Site

- Spring and Fall Grazing Area
- Gravity Energy "Pumps" Water



Crown land. This site is a grazing area in Lundbom Lake Commonage, south of Merritt, where a public Grasslands Interpretive Site, named in honour of Laurie Guichon, is being developed. A pond and wetland area on this site is the water source for the grazing livestock of Chutter Ranch Ltd. It was decided to make a 'typical' gravity-fed livestock watering system part of the public education information at this site. Initially the pond will not be fenced off from the livestock. Approximately 250 cows may use the site in a spring /fall grazing rotation.

The technical challenge of this site is the small elevation difference between the pond and a good waterer location. The best site (greatest head) would be too wet in the spring; most uplands sites were too high for gravity flow. The site chosen is 400 feet from the pond with a 1.5 foot elevation between 'average' low pond level and full waterer level.

To ensure water flow at this low 'head', 4 inch diameter PVC pipe is used that has an very low friction loss at the flow rate required. A 'typical' culvert-on-end is used for the intake. A screened inlet, shutoff valve and air inlet stand pipe are inside the culvert, which has openings along its side for water entry and is back filled with drain rock. A modified steel waterer (courtesy of Forest Service) is used.

The system was installed in November 2000 with the assistance of Ducks Unlimited and with equipment donated by Sanders & Co. of Merritt, BC.

The Laurie Guichon Memorial Grasslands Interpretive Site - Water Supply Pond / Wetland



This grazing area water source is gravity fed to a livestock waterer 400 feet away. Note the culvert intake with lid.

Project Funding Partners

These four projects grew out of funding for a demonstration project from the Ministry of Environment, Water Quality Section (Non-Point Source Pollution). This funded the first project at the Wolf Ranch in 1998.

Additional Ministry funding became available, along with funds from the Kamloops Stock Association (from the Beef Cattle Industry Development Fund), in-kind assistance from the landowners and, for one project, equipment from Sanders & Co, Merritt. Together with planning and installation assistance from the Ministry of Agriculture (author), the Ministry of Environment (Barb John), as well as Ducks Unlimited (Ken Johnson), three more projects were installed in 1999 and 2000. Total funding was \$16,000. With in-kind contributions estimated at \$6,000, each installation cost an average of \$5,500.

What Has Been Learned ?

To date, observations have been made at the Wolf Ranch, site #1, on the behavior of the cows, as noted. Limited observations have been made on sites #2 and #3. No livestock have used site #4 as of this writing date (spring 2001).

Observations and livestock tendencies noted so far include:

- Cows seem to be opportunistic, using the most readily available water
 - however, a water source close at hand but with poor access or footing may not be initially chosen
- Drinking patterns (i.e., time of day, herd instinct) may affect whether cows will 'wait-their-turn' at a waterer or walk away from it to drink at a somewhat distant, but uncrowded water source
 - winter waterers generally have small drinker openings to reduce the heat loss and this requires cows to be patient
 - this is not usually a concern once cows know that the waterer is reliable and they can drink whenever they want during the day
 - however, if an alternate water source (i.e., an unfenced watercourse) is easily accessible it may reduce their use of the waterer

What Is Next ?

Agriculture and AgriFood Canada, Kamloops Research Station, is collecting watering behaviour information on the Wolf Ranch, site #1, to more accurately assess livestock choice of either the waterer or the river.

These project sites are representative of many ranch situations that have established watercourse access. A temporary barrier, such as an electric fence, wooden debris, etc., may allow natural vegetation to re-grow, creating a permanent barrier at access points. A temporary barrier would allow a 'transition' period that may be necessary to change livestock watering behaviour.

Offstream systems, while potentially reducing watercourse and riparian impacts, (up to 80% reduced use by livestock on site #1 is estimated) come at a cost that can be significant:

- Livestock benefits need to be documented
- Riparian/water quality benefits need to be documented

Costs may need to be shared between landowners and others who benefit.