

# TECHNICAL NOTES

## **WATER REQUIRMENTS BEEF CATTLE**

### **SUMMARY**

This information is provided to supplement the NRCS 614 practice standard, Watering Facility, used to design cattle watering facilities.

Beef cattle water requirements vary during the year based on a number of factors including: animal weight, stage of growth, ambient air temperatures, and amount of moisture in the feed stock. Studies have been written to estimate the volume of water cattle need per day based on the above data. This technical note has been written to summarize that data and provide guidance on the design of watering facilities for beef cattle.

Most of the work on stock water systems in Washington State is based on water volume needed, which is determined for different species, class, age, and size of animals. A number of references were utilized to determine variations in water use by beef cattle. The classes of cattle used in this technical note are:

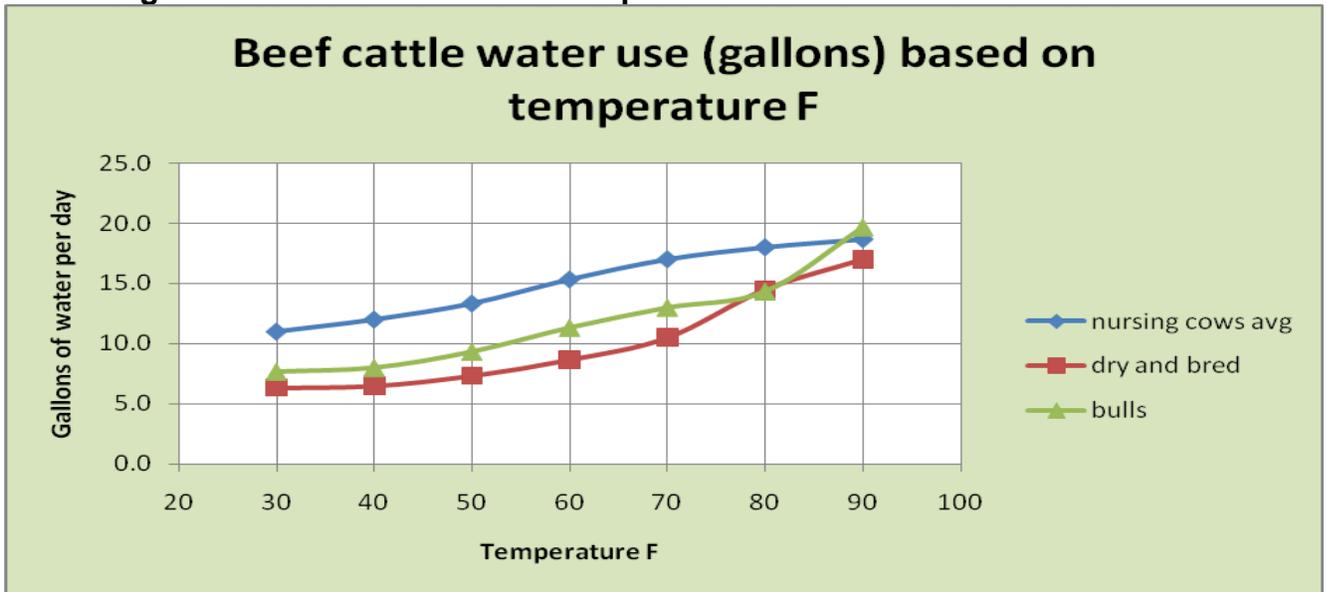
- Mature Cattle
  - Cows, nursing
  - Cows, dry and bred
  - Bulls
- Immature Cattle
  - Growing and finishing, 400 to 1000 lbs

Each of these four groups has different water volume needs. However, for most designs, the first three have been grouped into one water use category.

### **WATER USE – MATURE CATTLE**

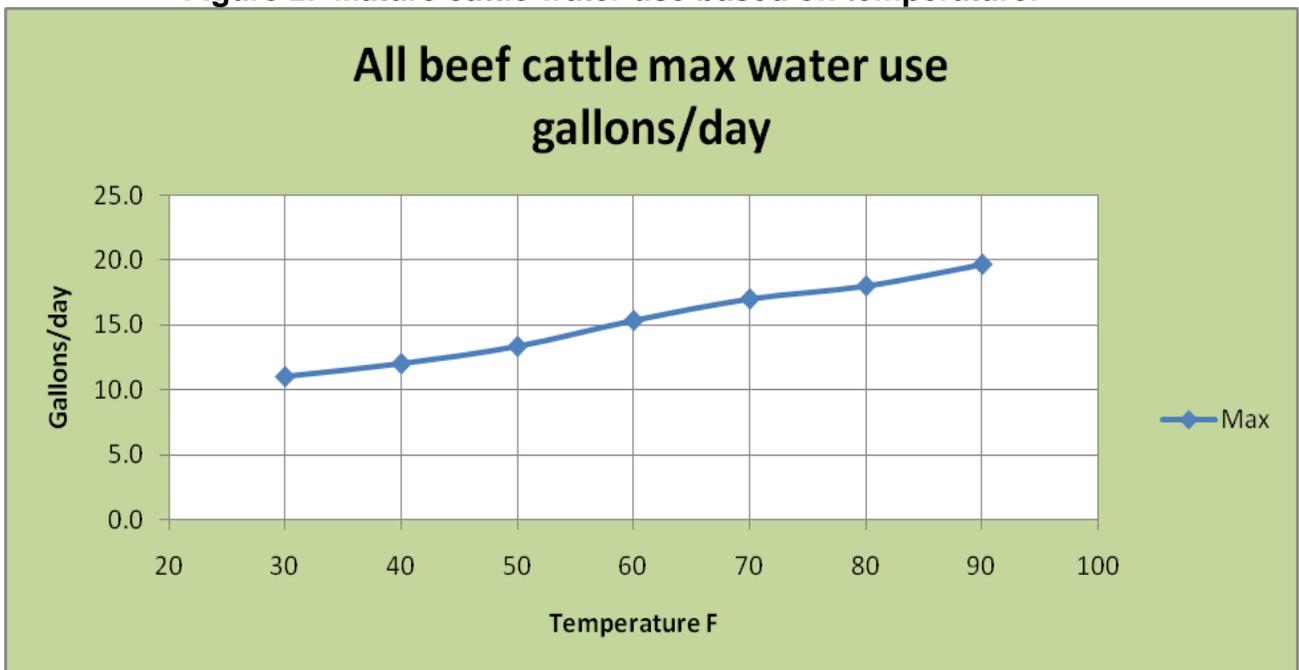
The water requirement for the mature cattle class is based on temperature as shown in the following graph, Figure 1.

Figure 1. Water use based on temperature and class of beef cattle.



The next chart, Figure 2 was developed by using the maximum value from the Figure 1 chart. Figure 2, shows the normal design volume to be used for the majority of our mature cattle needs. Other options could be used where conditions are warranted. For example, a bull pasture used only in the spring could use Figure 1. The temperature at the local location will determine the accurate volume for that design.

Figure 2. Mature cattle water use based on temperature.



At most temperatures, nursing cows have the highest water requirements of the three categories. Since most of the stock water systems are designed for cow/calf pairs on

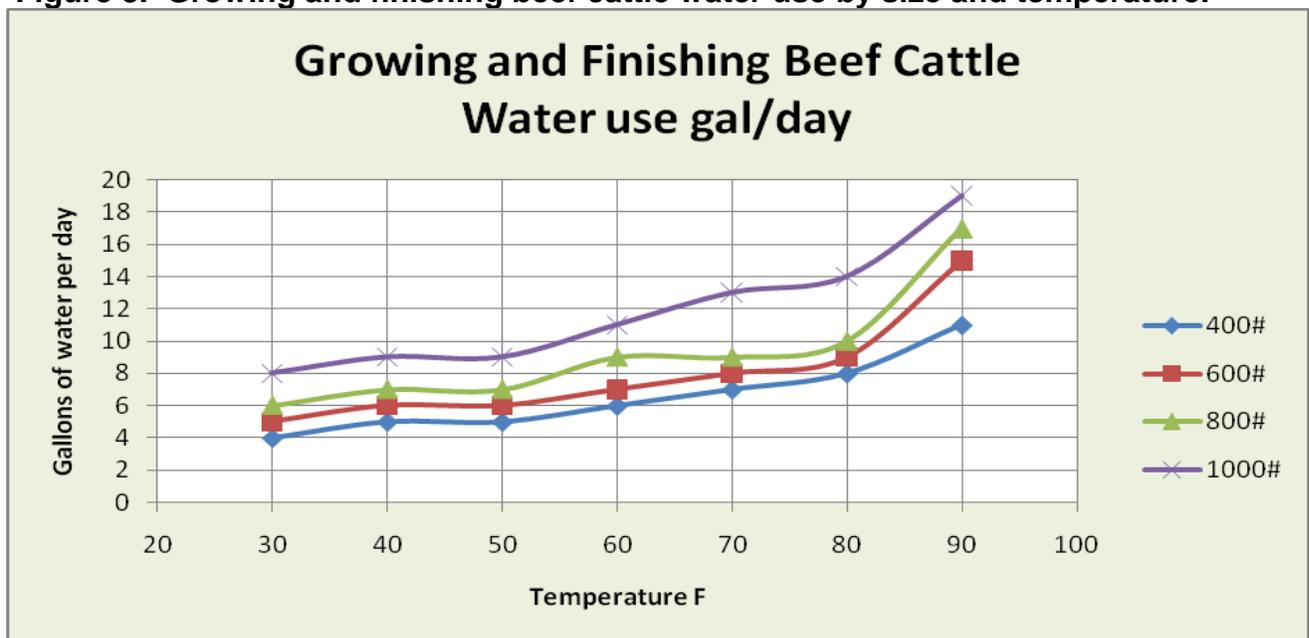
range conditions, the nursing cow volumes are used in most designs. If no nursing cows are utilizing the water, lower volumes could be used.

### **WATER USE – IMMATURE CATTLE**

Water use for growing and finishing beef cattle is determined by both the size of the animal and the temperature. The Figure 3 chart shows the water needed for 400 to 1000 pound animals at various temperatures. These values would be used when a landowner is using pasture or a feed lot for weaned animals. Water use for nursing calves is fairly low, usually less than 2 gallons per day. So, it is included in the mature cattle water volume.

The expected temperatures during the period of use can be used to adjust the volume of water provided and stored at a site, based on the size of the animals.

**Figure 3. Growing and finishing beef cattle water use by size and temperature.**



### **FORAGE**

Moisture content in feed stock provides some water to the animals. The amount of water in hay and grain, at 10% moisture, provides less than 1/3 of a gallon of water per day. If the animals are on silage or irrigated pasture feed, at 60-75% moisture, they can get 1 to 3 gallons of their daily water required from the feed stock.

### **TEMPERATURE**

Washington state maximum average temperature is shown on the map in Figure 4. This provides a fairly general guide to show variations across the state. Local data can be used to determine specific water design volumes for beef cattle at various times of the year.

Since cattle have lower water needs in cooler temperatures, systems used in the spring and fall could be designed at reduced volumes. Figure 5 map shows the average maximum temperatures for May/Oct in Washington. Again, local data for your site temperatures can be used where appropriate.

Water use is fairly constant at temperatures below 40°F. Therefore, systems designed to be used when temperatures will be below 40°F, use the 40°F amount.

**Figure 4. Washington Average Maximum Temperature**

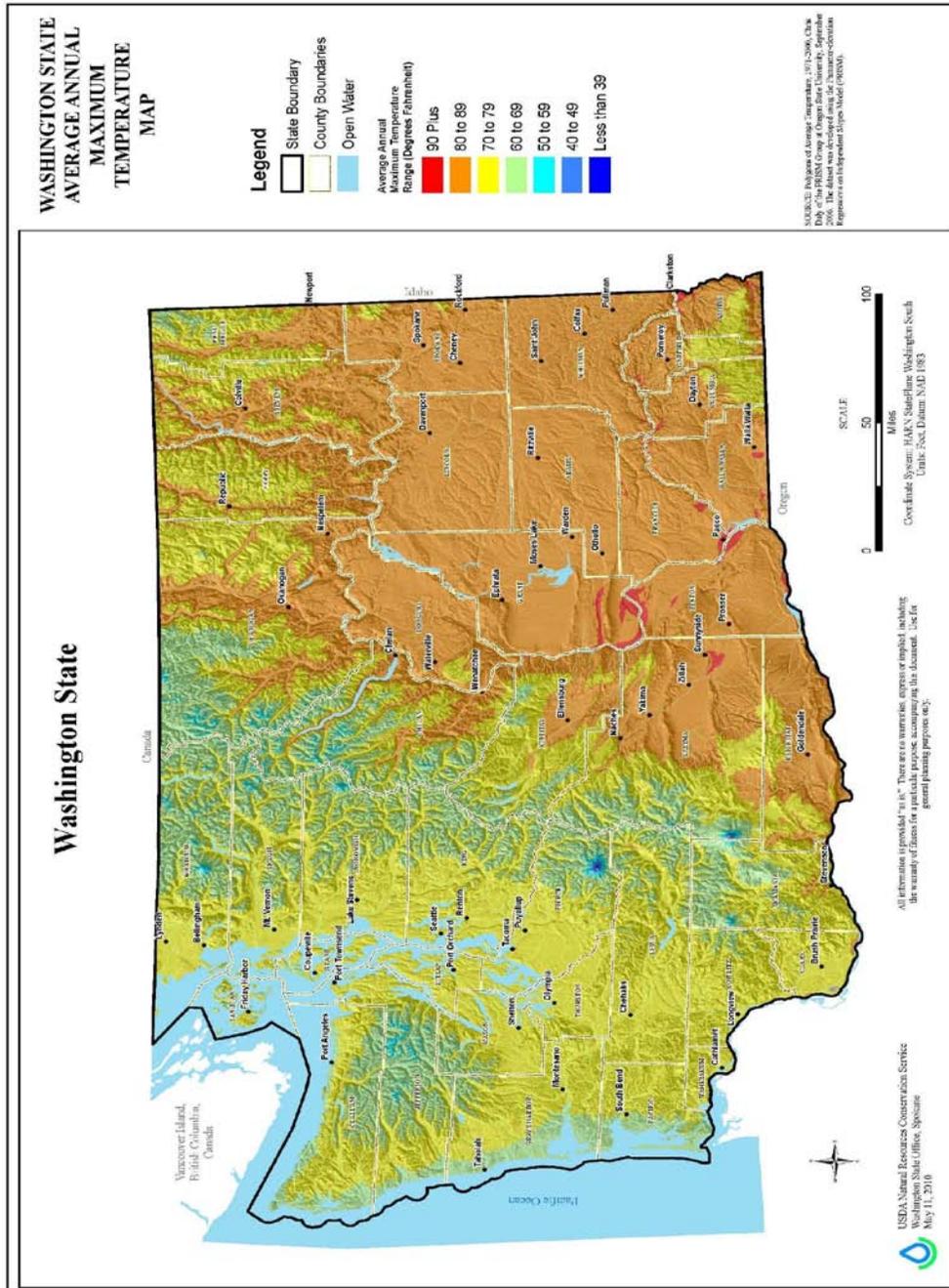
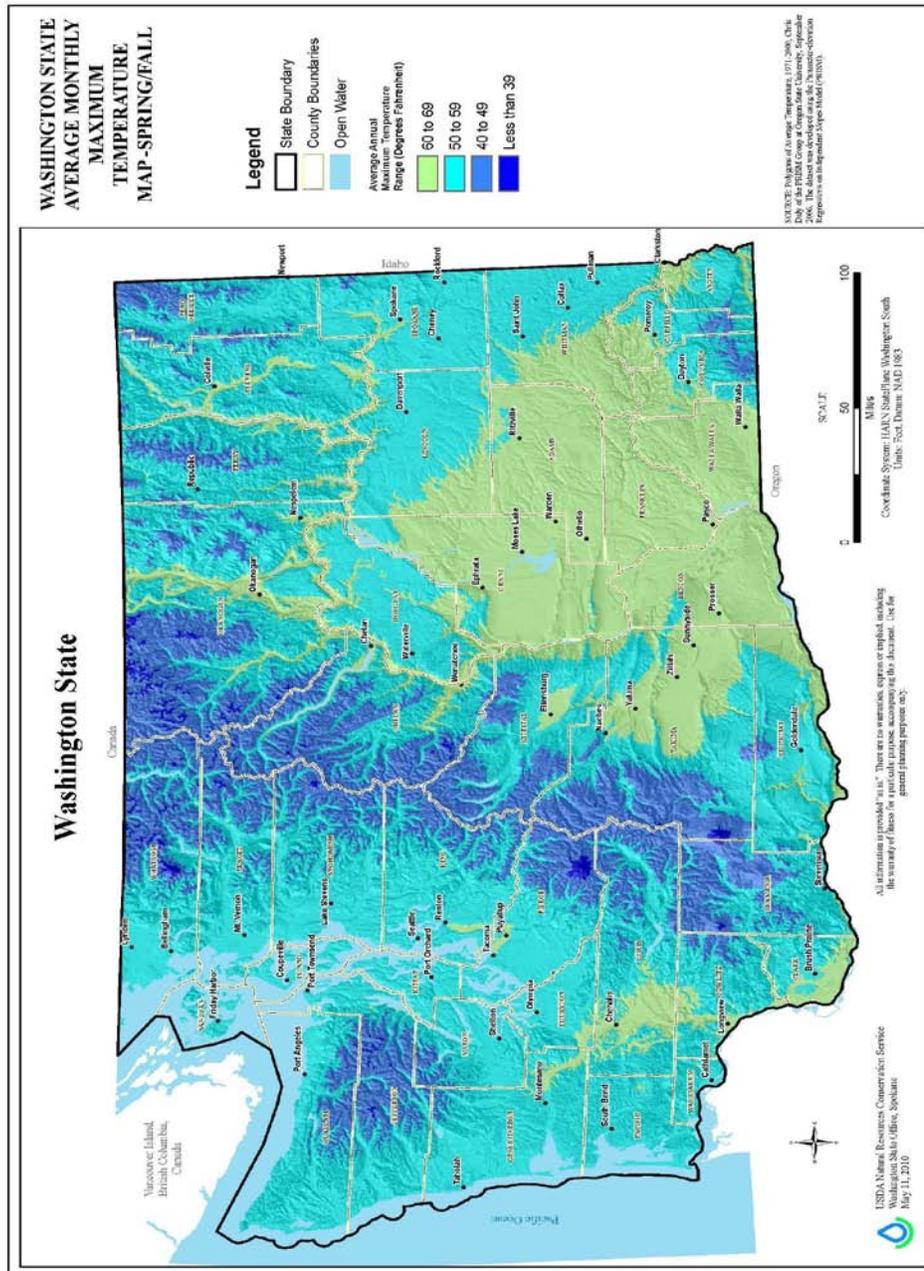


Figure 5. Washington Spring/Fall Average Maximum Temperature



## CONCLUSIONS

The cattle category, size, forage, along with temperature information can be used to determine water use requirements for beef cattle. The nursing cow water volume is recommended as the design amount unless other specific types of animals are the only known users. Other volumes are provided where different information is needed, such as season of use (spring/fall only) or different classes (bull pasture). For planning purposes 20 gal/day for the east side of Washington and 17 gal/day for the west side of Washington is a good starting point.

The temperatures shown here and the water use amounts are based on average monthly maximum values. The peak daily temperatures and corresponding water use could be greater than the amounts shown here. Use the information provided in this note as a minimum for design and work with the landowner and local range conservationists for specific design data.

## **REFERENCES, LITERATURE**

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