

# Watering Systems for Cattle Ponds

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The availability of sufficient quantities of clean water is often overlooked on beef cattle farms; however, it is often the most critical nutrient. Water may be supplied from various sources such as rural water, water wells, ponds, etc. While rural water and water wells may be used for watering livestock, they are often limited by availability. However, most producers have ponds on their properties that can be used for livestock watering. This document describes two watering devices that can be used for either watering cattle directly from ponds or within close proximity.

direct manure deposits. High nutrient levels can result in increased algae and weed growth with the associated reduction in environmental and cattle drinking water quality.

Appropriate pond management helps prevent negative health effects and also negative environmental effects such as erosion of banks and sediment intake that could render the pond unusable in the long term. Prolonged, unlimited access to ponds by livestock can result in destruction of fish habitat, reduction of pond volume and reduced animal performance.

## General Considerations

Allowing cattle unlimited access to ponds is not ideal from an animal health and environmental perspective. Cattle may loaf in ponds and may transfer internal parasites as a result. Foot rot is a common problem of animals lingering in ponds. Softened hoofs are easily damaged and may become infected with *fusobacteria*. One of the more important diseases advanced through the microclimatic conditions around ponds is leptospirosis. Fever, anorexia and possible calf abortion are possible symptoms of leptospirosis. Coccidiosis, caused by a protozoan parasite, may cause acute diarrhea, weight loss and the death of animals. Pond water may also have increased nitrogen or phosphorus levels that may stem from runoff or

## Watering System Designs

For many producers, ponds are the only way to provide water for livestock, especially cattle. There are several ways to water livestock from ponds, some of which are described here. These pond-watering devices are cost-effective, relatively easy to install and low maintenance. In Arkansas many livestock producers, including those involved with the 300 Day Grazing Program, already use these methods to effectively water livestock.

### Limited Access Floating Fences:

Establishing access to a pond for livestock watering is usually done in conjunction with fencing the entire pond to avoid negative impacts on the structural integrity of the pond and fish habitat. Fencing around the pond

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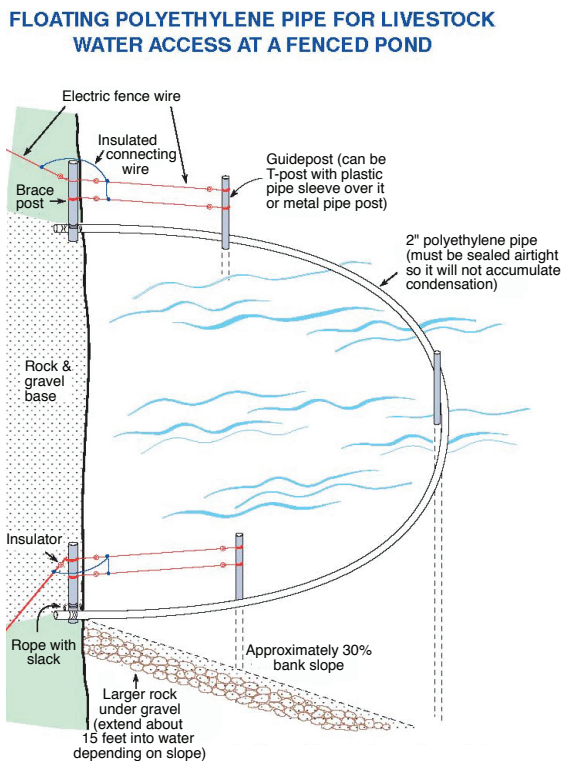
helps prevent bank and bottom damage due to cattle traffic. Since a pond is used to intercept runoff, effort should be made to avoid manure contamination through incoming waterways, spillways and shorelines. Ponds should be fenced, except the section assigned as cattle access for watering. An example for the watering access is depicted in Figure 1.

While the exclusion material used depends on what is available, utilizing electric fence wire is a cost-effective solution, given the durability of the material and ease of removal. The pond exclusion fence should be at least 12 feet away from the shoreline to provide for vehicle access in case of required vegetative control, pond maintenance or recreational activities. This buffer area also helps maintain vegetation that may filter occurring runoff and provide habitat for wildlife.

Two-inch polyvinyl chloride (PVC) pipe is commonly used to construct a floating fence. Plastic pipes are easy to cut to the desired length and connect to the required shape and length. The pipes should be sealed airtight so they don't accumulate water. Electric fence wire may be placed on top of the pipe approximately 20-30 inches above the water surface; 12.5 gauge high-tensile wire may be used to

obtain a high level of reliability and durability. The width of the floating fence will depend on the number of livestock watering from the access point. A floating fence width of 20-40 feet is sufficient for most situations. For a small herd of cattle, 20 feet appears to be appropriate, while 40 feet is considered sufficient for 200 cattle.

At the access point, the pond should have a slope of about 30 percent and should reach far enough into the pond so that a minimum water depth of 5 feet at the end of the slope is always maintained, even under normal conditions. A heavy use area should be created within and in front of the floating limited access area (Figure 2). To construct a heavy use area, install a 6- to 12-inch layer of rock and cover with gravel to maintain a firm base and to avoid development of runoff gullies. The gravel will also discourage livestock from standing for prolonged periods of time. The rock and gravel materials used for this purpose should feature angular shapes so they will interlock and provide a firm base. The gravel pad should be supported by an underlying geoweb or geotextile fabric that prevents sediment from seeping upwards through the pad. In general, the more solid the entire limited access floating fence construction, the longer it will last.



**Figure 1. Possible design of a floating fence.** (Source: M. D. Porter and C. K. Ly. 1997. Samuel Roberts Noble Foundation, Ardmore, Oklahoma)



**Figure 2. A heavy use area should be created within and in front of the floating limited access area.** Photo courtesy of John Jennings.

There are other examples of temporary low-cost setups similar to a limited access floating fence. In some instances, a single-strand polywire fence is sufficient to limit cattle access to ponds without the more expensive setup described above. An example of a temporary floating access across a pond using polywire is depicted in Figures 3 and 4. If the banks



**Figure 3. Temporary floating access across a pond using polywire.**

of the pond are not steep or cattle can reach the water without walking into the pond most of the time, then a simple fence might be feasible. The polywire must be raised to a height that will allow the animals to safely draw water. Overall bank stability and soil type surrounding the pond should also be taken into consideration. With more shallow and rockier soils in the northern part of the state, this setup might be workable, compared to other parts of the state where deeper soils may quickly lead to the disintegration of the pond banks.

**Drawing Water From Ponds:** Ponds are well suited for drawing water away to devices from which cattle are watered. Virtually any watering device can be connected to a pond outlet or modified so that reliable water delivery is achieved. The products on the market, such as stock tanks or automated waterers, can function just with gravity flow, for which a pond is ideal as it sits mostly on a slight slope and collects runoff from pastures located further up.

Some devices are more suitable than others, and there are a few things that should be considered when using a pond as a water source. In general, the pond water needs to meet the basic standards to serve as drinking water – free from chemical impurities that may affect cattle health and free of pathogens as much as possible. Ponds used for cattle watering away from the banks are usually clean, as cattle do not loaf in the bank vicinity and thus pathogen loads should be small. Ponds may serve multiple purposes, such as raising fish, watering livestock and offering recreational opportunities. Under these circumstances, care should be taken so



**Figure 4. Floating posts can be built from an old paint bucket that is filled with foam and weighted at the bottom to keep the post upright.**

that these different objectives do not conflict and compromise animal health. Maintaining a pond for fish may include controlling aquatic weeds and algae by adding chemicals that could affect animal health.

Gravity is used in most cases and is a reliable method of channeling water from the pond to the waterers. Since this happens at low pressure, larger pipes are needed to maintain the required volumes. A positive side effect is that low-pressure pipes are less expensive than high-pressure pipes. Care should be taken to maintain an adequate slope that keeps the water flowing and reduces air pockets that cannot be overcome just by back pressure from gravity. A pump may be used to redistribute water from a pond to water tanks (Figure 5). Gravity flow can also be used in conjunction with a pump, which can be reduced in size compared to pump-only systems.



**Figure 5. A pump is used to redistribute water from the pond to a water tank. Photo courtesy of John Jennings.**

Stock tanks, tire tanks, freeze-proof tanks and concrete tanks can all be supplied with water drawn from ponds. The optimal solution will depend on the topographic characteristics of the pasture or the farm. Normally, the distance between the pond and the watering device is relatively short, as the watering device is located just downslope of the pond. With large ponds located uphill, water can be piped across pastures to supply several paddocks or several devices. The installation of pipes is possible after the pond has been built, although it would be ideal to install pipes during pond construction. A good resource for building fences and laying drainage pipes and pipes that feed water devices is *Ponds – Planning, Design, Construction*, USDA-NRCS, Agriculture Handbook 590. This manual provides all the details for building ponds, inserting pipes into the pond walls (including how to seal them) and keeping debris from being collected at the water entry point.

It is appealing to consider a future expansion of the system if water is piped from ponds. If the change in altitude is substantial downhill, then pressure

reducers or safety valves should be considered to avoid damage to pipes, floats and other necessary equipment. If pipes are installed over long distances, feeding water from a pond with probably inconsistent water supply may not be the best option, as burying the pipe across differences in elevations requires a large construction effort.

For immediate delivery of pond water to a nearby watering device, it is important to build a heavy use area to cope with increased livestock traffic. These areas do not have to be overly complicated but should feature a layer of gravel that can absorb any water that may overflow or be splashed without creating muddy conditions around the waterer. Some sources suggest the gravel area be 4 to 6 inches deep and 6 feet around the device at the minimum. Depending on the soil type and general characteristics surrounding the waterer, the gravel pad may have to be supported by an underlying geoweb or geotextile fabric that prevents sediment from seeping upwards through the pad.

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FSA3128-PD-7-2015RV