USDA United States Department of Agriculture

Natural Resources Conservation Service

Soil and Plant Science Division

Soil Survey Region 5

Buffalo, Wyoming MLRA Soil Survey Office

The Minnow Pond Investigation Report

Purpose

Mr. B's pond level has been lowering over a period of years. Campbell County District Conservationist Tim Kellogg and Area Engineer Steve Cahoon asked the Buffalo Field Office to do an onsite soils/engineering investigation for this failing minnow pond. This constructed minnow breeding pond is currently the only local source of minnows for fishing. Locally-sourced minnows help to protect the area lakes from unwanted exotic species and diseases and are an important source of revenue for the community. This investigation and possible funding through the EQIP Program exemplify the NRCS's commitment to support aquaculture and the protection of the flora and fauna of local lakes.

As shown in photos on the following page, the dam around the minnow pond amounts to a berm that appears to have been created by bulldozing the existing raw shale into place. A PVC liner did not last and was replaced with a layer of bentonite clay by the current owner. This berm is currently overgrown with cottonwood and tamarisk. Looking at the orthophotos, seeps are clearly visible across the road below the dam, likely forming from the pond water seeping on and along the shale paralithic contact. The size of the seeps has increased with time, and the water that once produced minnows for fishing is now growing pasture grass.

Key Outcomes

We made *visual observations* of plant responses to an expanding water source. We tested for *gypsum* by checking white concentrations with a diluted hydrogen chloride (HCl). If acid is dropped onto calcium carbonate (CaC03), it produces bubbles of carbon dioxide. *Electrical conductivity (EC)* also was tested. Gypsum is more soluble than CaC03 and this is evidenced by a higher EC.

In MLRA 58B, the pedogenic accumulations of salt primarily consist of calcium carbonate or gypsum. The soils in this area were mapped Cromack-Fairburn-Ucross. We also found Sabatka, a similar soil formed in non-acidic shale. If the berm can be made legally and physically viable again, we recommend the trees be removed and to install a PVC liner thick enough to support the weight and resist the sharpness of the deer hooves that penetrated the original liner.

The current condition of the minnow pond at the Wyoming ranch.

Pedogenic gypsum: note the blue arrows. This raw, chippy shale parent material is found at a depth of 20-40" in the soil just north of the pond.