

UNITED STATES GOVERNMENT
MEMORANDUM

DATE: February 14, 2012

REPLY TO

ATTN OF: Project Leader, Fort Niobrara-Valentine NWR Complex (64520)

SUBJECT: 2011 Water Use Report and 2012 Water Management Plan – Fort Niobrara NWR

TO: Barbara Boyle, Refuge Program Supervisor CO/KS/NE

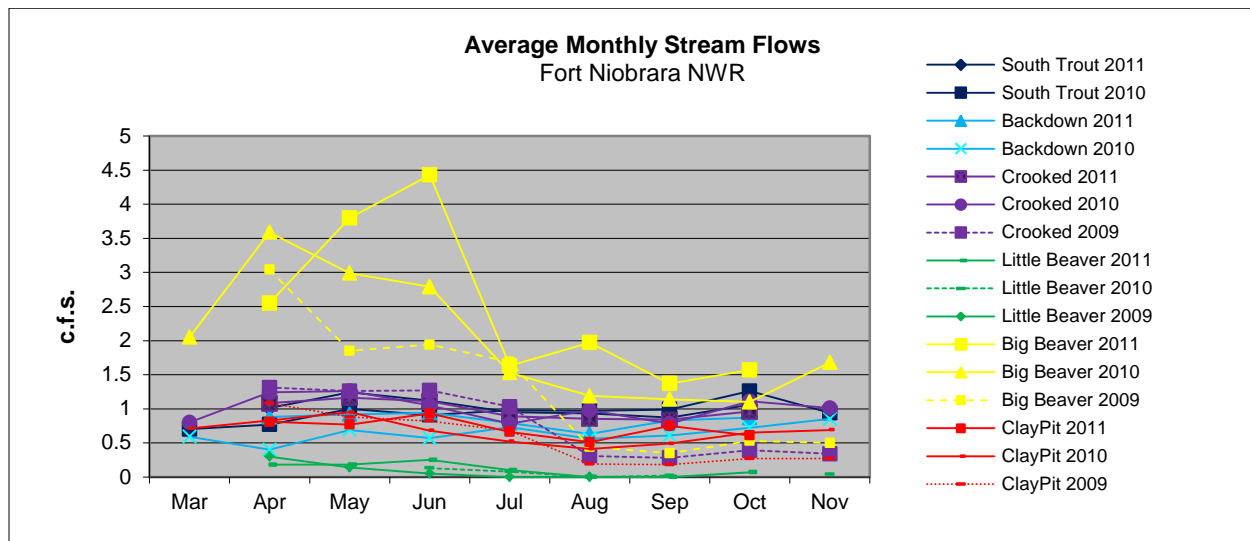
Approximately 375 acres of Fort Niobrara NWR are classified as open water / wetland and include ~9 miles of the Niobrara River, numerous feeder streams, and ponds. The Niobrara River is a geologically, ecologically, and economically significant resource of the Refuge and State of Nebraska. In recent years, several governmental and non-governmental agencies have recognized the need to better manage the surface and ground water resources of the Niobrara River so they are sustainable in the long term. Several scientific studies have been initiated by the USFWS, Nebraska Game and Parks Commission (NGPC), and others to help quantify an in-stream flow. Some of these studies are also looking at the impacts of man-made structures on the Niobrara River including the Cornell Dam located on Fort Niobrara NWR. Although the Cornell Dam is no longer operational as a hydroelectric plant, it does have potential influence on sediment transport, water temperature, fish communities, and riparian vegetation.

2011 Water Management:

Project Leader Steve Hicks, Refuge Supervisor Barbara Boyle, and Water Resources Chief Meg Estep met with National Park Service staff, FWS and NPS solicitors, and Department of Justice lawyers to examine what we need to do to move forward with a Federal reserved water right.

In conjunction with surface and ground water issues, monitoring of flows in several tributary streams of the Niobrara River on the refuge has been done since 2009. Streams on the refuge flow into the Niobrara River and are hydrologically connected to the surrounding area. Some of the streams may be negatively impacted by off-refuge activities (i.e. center pivot irrigation systems). Several streams are located within the Fort Niobrara Wilderness Area, thus altered flow levels could affect values associated with this special designation and management responsibility. Baseline data collected with a portable flow meter show the different flow rates of streams across the year with higher flows generally occurring after spring runoff/ground thaw in March and April, temporary increases in flow levels of larger creeks following several inches of rain during summer thunderstorms, steadily declining to lower flows in August and September, and then increasing slightly before winter freeze conditions (Figure 1.) With the assistance of R6 Water Resources staff, two flow modules programed to collect data every 15 minutes were placed in two smaller streams (Backdown, SouthTrout) on the south side of the Niobrara River in late summer. Flow module data show variation in flow rates across the day and even capture a temporary spike in stream flow at both sites following a .75 inch precipitation event.

Figure 1. Average monthly flow rates (cubic feet per second) of streams on Fort Niobrara NWR.



Active water management activities on the refuge historically, and in 2011 are limited and involve the manipulation of water levels within 13 spring-fed ponds (total surface acres ~ 9.13) located outside of the Fort Niobrara Wilderness Area. These artificial impoundments have been used by the NGPC (Fisheries Division) under cooperative agreement for fish rearing and maintenance of brood stock since the 1930s. Refuge uses, such as providing water for bison and elk or habitat for waterfowl and other wildlife species, guide management decisions for the ponds. Ponds are generally maintained at full capacity with periodic drawdowns accomplished for aquatic vegetation management (fish rearing), removal of fish, or structure repair (Table 1.)

Table 1. Summary of pond use for 2011.

Pond Name	Location	Water Impounded	Principle Use	Water Depth	Surface Acres	Comments
South Trout	H.U. 32	6/18/10-5/19/11; 7/11/11-?	Bison & Other Wildlife; Fish.	4'	.28	BLG & BBH (Over-wintering and production).
Middle Trout	H.U. 25	5/18/10-3/31/11; 7/11/11-9/14/11	Wildlife.	4'	.1	No fish.
North Trout	H.U. 25	4/26/10-4/15/11; 6/3/11-9/12/11	Wildlife; Fish.	4'	.31	BLG (Over-wintering and production).
Backdown	H.U. 16	4/26/10-4/25/11; 6/01/11-?	Bison, Elk & Other Wildlife; Fish.	6'	.55	LMB & SMB (production); RBT & BBH (forage).
Y Elk	H.U. 16	5/7/09-?	Bison, Elk & Other Wildlife; Fish.	6'	.36	BLG (Over-wintering and production).
West Elk	H.U. 16	5/19/10-?	Bison, Elk & Other Wildlife; Fish.	4'	.37	BLG (Over-wintering and production).
East Elk	H.U. 16	5/11/10-?	Bison, Elk & Other Wildlife; Fish.	5'	.31	BLG (Over-wintering and production).
Exhibition #1	H.U. 27	5/19/10-?	Bison & Other Wildlife; Fish.	4'	.29	BLG (Over-wintering and production).
Exhibition #2	H.U. 27	4/26/10-3/22/11; 3/31/11-?	Bison & Other Wildlife; Fish.	5'	1.3	LMB, BLG, & CCF (Over-wintering and/or production).
Exhibition #3	H.U. 27	4/26/10-3/21/11; 3/31/11-?	Bison & Other Wildlife; Fish.	5'	1.24	LMB, BLG, & CCF (Over-wintering and/or production).
Y Pond	H.U. 27	4/26/10-3/21/11; 4/28/11-?	Bison & Other Wildlife; Fish.	5'	2.0	LMB, BLG, & CCF (Over-wintering and/or production).

Corral	H.U. 27	4/19/11-9/12/11; 9/13/11-10/20/11	Bison & Other Wildlife; Fish	6'	1.01	LMB (production).
Fair	H.U. 13	5/12/11-6/21/11; 6/21/11-8/15/11; 9/14/11-10/3/11	Wildlife; Government Horses; Fish	8'	1.01	LMB (rearing); RBT (Kid's Fishing Day).

Twenty-five windmill systems are maintained to provide water for bison and elk and serve as a reloading source during wildfire suppression. An approximate 3.5 mile water pipeline system off an existing well provides water for bison in 4 habitat management units. None of the wells are metered.

There are solar powered pumps collocated with 6 of the stock watering windmills at Fort Niobrara. Some of these are in the same well as the windmill and some of them are in a well adjacent to the windmill well. The solar pumps help out when there isn't enough wind power to keep up with water demand.

Proposed 2012 Water Management:

Six ponds in habitat units 13 and 27 will be drawn down in the spring by the NGPC for vegetation management. Short term draw-downs for fish removal and structure maintenance will be scheduled in all ponds so as to not conflict with refuge management priorities including the use by bison, elk, and other wildlife.

Stream flow monitoring activities will continue in 2012 with support and guidance from Water Resources staff in Denver. Flow modules will be placed in Big Beaver, Crooked Creek, and two additional creeks; and the portable flow meter will be used to collect data on other creeks.

Refuge staff will continue to work with the Nebraska Department of Natural Resources, NGPC, and other entities to secure a State in-stream flow appropriation for the Niobrara River. We will support scientific studies that will provide information on water flow and volume required to support Refuge, Wilderness and Scenic River values. We will continue to work with R6 Water Resources staff to move forward with a Federal reserved water right.

Refuge staff will also continue to gather information needed to make a sound decision about Cornell Dam. Removing or leaving the dam is a contentious issue. This information gathering will be used in development of the next Comprehensive Conservation Plan and Environmental Assessment (tentatively scheduled 2014).

Submitted By: _____ Date: _____

Reviewed and
Approved By: _____ Date: _____

FORT NIOBRARA NWR

ANNUAL WATER MANAGEMENT PLAN
2011 WATER USE REPORT
2012 MANAGEMENT PLAN

Prepared by:_____

Date:_____

Submitted:_____

Date:_____

Project Leader

Approved:_____

Date:_____

Regional Refuge Supervisor

Concur: _____

Date:_____

Chief, Water Resources Division