5. Planning Regions and Regional Assessment Locations

5.1 Background

The BRRWD has established locations within the District called *regional assessment locations* (RALs). The BRRWD has identified these locations within the District to be locations which can be used to monitor and assess project and program effectiveness essentially acting as "report cards". RALs will also be useful in identifying trends resulting from the activities of the District and others within the BRRWD. Regional assessment locations are intended to represent real locations within the BRRWD for establishing quantifiable goals representing some desired future condition. Regional assessment locations are expected to be used to evaluate and quantify progress toward accomplishing quantifiable goals and ensure measurable outcomes.

Twenty-five RALs have been identified by the BRRWD and are shown on **Figure 5.1** and are summarized below in **Table 5.1**. At least one RAL has been identified for each of the seven planning regions. Some planning regions have multiple RALs due to the number of tributaries or sheer size of the contributing area of the planning region. In general, RALs were located near the outlet of various planning regions. An attempt was made to place RALs at road crossings as access to the RAL site under varying conditions is necessary and changing land ownership can sometimes lead to trespass issues.

A RAL may be established for a single purpose or multiple purposes. **Table 5.2** shows what will be monitored at each RAL and who will complete the monitoring. A RAL may be located in an area with only flooding problems and used to assess the effectiveness of projects and programs in reducing the peak rate of discharge or the flood elevation. Alternatively, a RAL may be located in an area where sedimentation is a problem and used solely to evaluate and assess the success of upstream agricultural conservation measures. Most RALs were established for a combination of purposes; i.e., flood damage reduction, water quality, geomorphology and biotic integrity.

The RAL have been established at the locations listed in the table and shown on the map, however, they are subject to change. As time passes, it may be determined that it is advantageous to relocate some of the RALs to more suitable locations. For example in some cases, bridges have been removed which make some sites unsafe and difficult for sampling during higher flow conditions. In these cases, the RAL was relocated to other nearby locations. **Table 5.2** also lists RAL as being primary or secondary monitoring locations. Should funding be inadequate to complete the sampling at all locations, the primary sites have been identified to prioritize where funds are spent monitoring.

Table 5.1. Regional Assessment Locations in the BRRWD.

RAL ID	General Location	RAL Planning Region	Planning Region(s) upstream of RAL	Planning Region(s) downstream of RAL	Detailed Location Description
BUF-1	Mouth of Buffalo River (main branch) (upstream of confluence with the Red River)	Northern	Mainstem, Lakes, Central, and Southern	None	The BR-1 site is the furthest downstream monitoring site on the Buffalo River. The site is located at the County Road No. 108 crossing over the Buffalo River near Georgetown, MN.
BR-2 / BUFCLAY94	Buffalo River at the Dilworth USGS Gage	Northern	Mainstem, Lakes, Central, and Southern	None	The BR-2 site is locate at Clay County Road No. 94 crossing of the Buffalo River at the USGS Gaging Station 05062000 (Buffalo River Near Dilworth, MN)
BR-3 / BUFCR18	Buffalo River (Downstream from South Branch)	Northern	Mainstem, Lakes, Central, and Southern	None	The BR-3 site is locate at Clay CSAH No. 18 crossing of the Buffalo River approximately 3 miles northwest of Glyndon. This site represents the combination of the Buffalo River and South Branch River as the confluence of these two rivers is a short distance upstream.
BR-4 / BUFCR68	Outlet of Mainstem Region (Buffalo River Upstream of South Branch)	Mainstem	Lakes	Northern	The BR-4 site is locate at Clay County Road No. 68 crossing of the Buffalo River approximately 2 miles northwest of Glyndon. This site represents the Buffalo River upstream of its confluence with the South Branch River as the confluence of these two rivers is a short distance downstream.
BR-5 / HAW31	Buffalo River at the Hawley USGS Gage	Mainstem	Lakes	Northern	The BR-5 site is locate at Clay CSAH No. 31 crossing of the Buffalo River just south of Hawley. This site is located just upstream of USGS Gaging Station 05061000 Buffalo River at Hawley.

RAL ID	General Location	RAL Planning Region	Planning Region(s) upstream of RAL	Planning Region(s) downstream of RAL	Detailed Location Description
BR-6 / ManJct	Buffalo River upstream of Hay Creek (North)	Mainstem	Lakes	Northern	The BR-6 site is locate at the 28th Avenue North crossing of the Buffalo River approximately 4 miles northeast of Hawley. This site is located about 4000 feet upstream of the confluence of Hay Creek and the Buffalo River.
BUF9 / 09RD005	Buffalo River downstream of Becker County Ditch No. 15	Mainstem	Lakes	Northern	The BUF9 site is locate at Becker CSAH No. 9 crossing of the Buffalo River approximately 5 miles north of Lake Park. Becker County Ditch No. 9 enters the Buffalo River approximately 2,000 feet downstream.
HC-1 / 09RD003	Outlet of Hay Creek (North)	Mainstem	None	Northern	The HC-1 site is located at the 265th Street crossing of Hay Creek approximately 3.5 miles NE of Hawley. This site represents the essentially all of the Hay Creek (North) contribution to the Buffalo River as the confluence of these two waterways is about 1,100 feet downstream.
BCD-15 / 09RD004 / HAMDEN1	Outlet of Becker County Ditch No. 15	Mainstem	None	Northern	The BCD-15 site is located at the 170th Avenue crossing of Becker County Ditch No. 15 approximately 5 miles NNE of Lake Park. This site represents the essentially all of the Becker County Ditch No. 15 contribution to the Buffalo River as the confluence of these two waterways is approximately 1 mile downstream.
BUF14	Buffalo River near Callaway	Lakes	None	Mainstem, Northern	The BUF14 site is located near the Becker CSAH No. 14 crossing of the Buffalo River just east of Callaway.
BL-1	Outlet of Buffalo Lake	Lakes	None	Mainstem, Northern	The BL-1 site is located near the Becker CSAH No. 34 crossing of the Buffalo River just east of the Village of Richwood. This site represents the Headwates of the Buffalo River.
SB-5 / BUFSB79	Outlet of Central Region	Central	Southern	Northern	The SB-5 site is located at Clay County Road No. 79 crossing of the South Branch of the Buffalo River approximately 2 miles south of US Highway 10. This site represents the South Branch of the Buffalo River upstream of its confluence with the Buffalo River as the confluence of these two rivers is about 6.5 miles downstream.

RAL ID	General Location	RAL Planning Region	Planning Region(s) upstream of RAL	Planning Region(s) downstream of RAL	Detailed Location Description
BUFSB67	South Branch of the Buffalo River at the USGS Gage at Sabin	Central	Southern	Northern	The BUFSB67 site is located at the Clay County Road No. 67 crossing of the South Branch of the Buffalo River approximately 0.3 miles downstream of Stony Creek. This site represents the South Branch of the Buffalo River downstream of its confluence with Stony Creek.
SC-1 / STONY68	Mouth of Stony Creek	Central	None	Northern	The SC-1 site is located at Clay County Road No. 68 crossing of the Stony Creek approximately 2 miles east of Sabin. This site represents the essentially all of the Stony Creek contribution to the South Branch of the Buffalo River as the confluence of these twowaterways is a approximately 1.3 miles downstream.
SB-4 / BUFSB63	South Branch upstream of Stony Creek junction	Central	Southern	Northern	The SB-4 site is located at Clay County Road No. 63 (80th Street) crossing of the South Branch of the Buffalo River approximately 1 mile southeast of Sabin, MN. This site represents the South Branch of the Buffalo River upstream of its confluence with Stony Creek as the confluence of these two waterways is about 0.8 mile downstream.
WC-1 / 09RD008	Outlet of Whisky Creek	Central	Southern	Northern	The WC-1 site is located at the 80th Street crossing of Whisky Creek between Sections 9 and 10, T137N, R47W (Alliance Township), Clay County. This site represents the essentially all of the Whisky Creek contribution to the South Branch. The site is located just upstream of its confluence with the South Branch of the Buffalo River as the confluence of these two waterways is about 900 feet downstream.
BUFSB60	South Branch downstream of the Whisky Creek junction	Central	Southern	Northern	The BUFSB60 site is located at the township road (130th Avenue South) crossing of the South Branch of the Buffalo River approximately 5 miles south of Sabin, MN. This site represents the South Branch of the Buffalo River downstream of its confluence with Whisky Creek as the confluence of these two waterways is about 2.3 river miles upstream.

RAL ID	General Location	RAL Planning Region	Planning Region(s) upstream of RAL	Planning Region(s) downstream of RAL	Detailed Location Description
SB-3 / (BUFSB60-09RD008)	Outlet of Southern Region	Southern / Central	None	Central, Northern	The SB-3 site is located on the South Branch of the Buffalo River just upstream of Whisky Creek at Clay County Road No. 57. This site represents the outlet of the Southern Planning Region. Discharge and Water Quality parameters will be determine by the difference between the data collected for BUFSB60 and 09RD008. The BUFSB60 site is located downstream of Whisky Creek at the 130th Avenue South crossing of the South Branch, and 09RD008 is located at 90th Street near the outlet of Whisky Creek.
SB-2 / BufUp	South Branch Buffalo River Upstream of Deerhorn Creek	Southern	None	Central, Northern	The SB-2 site is located on the South Branch of the Buffalo River just upstream of Deerhorn Creek at the township road crossing located between Sections 20 and 29, T136N, R46W (Atherton Township), Wilkin County approximately 2 miles west of MN Highway No. 9. This site represents the essentially all of the South Branch upstream of Deerhorn Creek as the confluence of these two waterways is less than a mile downstream.
DC-1 / DeerHW	Outlet of Deerhorn Creek	Southern	None	Central Northern	The DC-1 site is located on Deerhorn Creek just upstream of the South Branch of the Buffalo River at the township road crossing located between Sections 20 and 21, T136N, R46W (Atherton Township), Wilkin County approximately 1 mile west of MN Highway No. 9. This site represents the essentially all of the Deerhorn Creek contribution to the South Branch as the confluence of these two waterways is approximately a mile downstream.

RAL ID	General Location	RAL Planning Region	Planning Region(s) upstream of RAL	Planning Region(s) downstream of RAL	Detailed Location Description
WoVC-1	Mouth of Wolverton Creek	Western	None	Moorhead, Northern	The WoVC-1 site is located on Deerhorn Creek just upstream of the South Branch of the Buffalo River at the township road crossing located between Sections 5 and 6, T137N, R48W (Holy Cross Township), Clay County approximately 1 mile west of US Highway No. 75 on County Road No. 59. This site represents the essentially all of the Wolverton Creek contribution to the Red River as the confluence of these two waterways is approximately a 3000 feet downstream.
RR-1	Red River near south extent of the Western Planning Region	Western	None	Moorhead, Northern	The RR-1 site is located on Red River at the Wilkin CSAH No. 30 crossing approximately 1 mile northwest of Wolverton. This site represents all of the contributing area of the Red River upstream of the BRRWD. The site does include a very small portion of the BRRWD for drainage as the political boundary of the BRRWD is approximately 2 miles south of this location.
RR-2	Red River near the Western Region Outlet Into Moorhead Region	Western	Western	Moorhead, Northern	The RR-2 site is located on Red River at the Clay CSAH No. 12 (Convent Road) crossing approximately 1.4 mile west of US Highway No. 75.
RR-3	Red River near the north border of the Moorhead Planning Region	Moorhead	Western, Moorhead	Northern	The RR-3 site is located on Red River at the Clay CSAH No. 26 crossing approximately 3.5 miles west of US Highway No. 75.
RR-4	Outlet of Northern Region (downstream on Red River after confluence with the Buffalo River)	Northern	Northern, Moorhead, and Western	None	The RR-4 site is located on Red River at the Clay CSAH No. 36 crossing approximately 1 mile northwest of Georgetown.

Table 5.2 Parameters Evaluated at Regional Assessment Locations.

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
BUF-1	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MN Department of Ag
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BR-2 / BUFCLAY94	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous	USGS
		Discharge	Long Term Discharge monitoring station - Measurements as needed to verify rating curve	USGS
		Geomorphology	Every 10 years	DNR
BR-3 / BUFCR18	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
BR-4 / BUFCR68	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BR-5 / HAW31	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous	USGS
		Discharge	Long Term Discharge monitoring station - Measurements as needed to verify rating curve	USGS
		Geomorphology	Every 10 years	DNR
BR-6 / ManJct	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
BUF9 / 09RD005	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
HC-1 / 09RD003	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
BCD-15 / 09RD004 / HAMDEN1	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BUF14	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BL-1	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Periodic during open water season	DNR Lake Gage Reader
		Geomorphology	Every 10 years	DNR
SB-5 / BUFSB79	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BUFSB67	Primary	Water Surface Elevation / Stage	Continuous	USGS
		Discharge	Long Term Discharge monitoring station - Measurements as needed to verify rating curve.	USGS
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season if sampling is not occuring at monitoring sites SC-1 and BUFSB63.	USGS, MPCA
SC-1 / STONY68	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first few years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
SB-4 / BUFSB63	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
WC-1 / 09RD008	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
BUFSB60	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
SB-3 / (BUFSB60-09RD008)	Secondary	None	---	---
SB-2 / BufUp	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
DC-1 / DeerHW	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season.	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
WoVC-1	Primary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Continuous during open water season	MPCA
		Discharge	Periodically through first two years to develop Rating Curve. Less frequent in later years to verify rating curve.	DNR
		Geomorphology	Every 10 years	DNR
RR-1	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
RR-2	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
RR-3	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR
RR-4	Secondary	Fish IBI	Every 10 years	MPCA/DNR
		Invertebrate IBI	Every 10 years	MPCA/DNR

RAL ID	Primary or Secondary RAL	Parameters Evaluated	Frequency of Sampling/Review	Parties Involved in Sampling
		Water Quality (Cl, DO, N, P, Temperature, pH, Turbidity, Sediment, E.coli)	Monthly During the open water season	BRRWD through Riverwatch, MPCA, MN Department of Ag
		Water Surface Elevation / Stage	Monthly During the open water season in conjunction with other monitoring.	MPCA
		Geomorphology	Every 10 years	DNR

The RALs have been used not only to assess changes in the landscape, but to establish quantifiable goals. Quantifiable goal setting has been completed either at a specific RAL or on a Planning Region basis or both, depending on the parameter being considered. The goals in some cases are quite specific and more general in other cases, depending upon the amount of available information. In reality, the condition at a RAL integrates the upstream landscape condition within the contributing drainage area.

The goals established by this plan should be interpreted as "desirable targets" of the desired future landscape condition. At this time, runoff volume reduction, wetland restoration, native prairie restoration, and vegetative buffer goals are set on a planning region basis, while water quality goals and peak discharge goals have been or are anticipated to be established for the RAL locations.

5.2 Existing and Desired Future Conditions

Some description of the existing landscape resource condition is necessary in order to establish a baseline for assessing trends and as a basis for evaluating "progress." Existing conditions as well as the goals reflecting the Desired Future Conditions (DFC) can be described either through the use of actual measured data collected through monitoring efforts, models used to forecast resource condition, or a combination of monitoring information and modeling. Although many local, state, and federal agencies have been active within the BRRWD, the amount and quality of information available to describe existing conditions depends upon the type of resource. For example, less information is available within the BRRWD to describe existing conditions for the geomorphic stability of streams, than for the peak rate of discharge that leads to flooding. Expectations are that as the BRRWD along with other local, state and federal agencies complete additional technical information, the quality of information and means and methods used to describe existing conditions (and the Desired Future Condition) may change.

Recognizing that the resource condition and therefore the existing conditions and the goals used to describe the DFC are interdependent is critical. For example, a goal to stabilize a portion of stream is dependent upon the goal to alter the peak rate or volume of runoff. Altering the amount of wetlands within an area, can affect the amount of sediment moving downstream and hydrology. As solutions are recommended and as project complexity increases, it may be of value to evaluate this interdependence at the RALs.

The existing conditions and DFC at the Regional Assessment Locations are defined in terms of water quality, water quantity, stream geomorphology, and upstream natural resource conditions affecting water resources. The existing conditions of a number of parameters may not be known in great detail at this time but, hopefully over time, greater detail may be provided as data become more readily available.

The goals corresponding to the DFC at the RALs are also important. Improving resources within the BRRWD requires establishing quantifiable (measurable) goals for flood damage reduction and enhancing natural resources in the future. This BRRWD had developed goals with the intent of providing a vision for the future (i.e., "Desired Future Conditions") within the BRRWD. The Desired Future Conditions generally reflects resource conditions, such as the:

- Distribution of wetlands by Planning Region;
- The quantity and locations of native prairie blocks within the District;
- Maximum rate of discharge or runoff volume at key locations;
- The contribution of the BRRWD to the peak discharge on the mainstem of the Red River;
- Water quality and attainment of standard; and
- General locations for establishing buffer strips.

The basis for these goals comes from multiple sources and certainly not the BRRWD alone. For example, the wetland and prairie restoration goals come from U.S. Fish and Wildlife Service planning documents. The BRRWD incorporated these goals based on input requested and received during the planning process, as recognition of their importance. Therefore, the goals are subject to change as more information becomes available.

The BRRWD also intends to use the DFCs and goals within this WMP, as means to focus funding and other requests for assistance, from a variety of sources. The BRRWD anticipates greater priority for expenditures in those areas that contribute progress toward a DFC.

The quantifiable, measurable goals corresponding to the DFCs, should not be construed as having any regulatory or legal meaning. The purpose is simply to establish

targets for the future for various resources within the District. The goals correspond to a DFC and are expected to be used to assess the potential adverse and beneficial effects of projects and programs as well as other purposes.

The existing and DFC for a variety of resources by planning region or location within the BRRWD are presented in **this section and Appendices A through G**. These tables are subject to revision based on additional studies and experiences gained by the District.

5.2.1 Hydrology

Flood damage reduction in the BRRWD is a major focus of District activities. In order to reduce flood damages, the BRRWD must have an understanding of existing hydrology. When addressing the hydrology of the BRRWD, both runoff volume and peak discharges were considered. Goals for flow volume reductions were established based on modeling. The runoff volume reduction goals were set, based on modeling, to achieve the desired peak discharge goals. Peak discharge goals have been set for the RALs.

Goals have been set for flow volume reductions on various streams within the BRRWD on a planning region and major subwatershed basis. Meeting these goals will require a strategic plan for runoff volume reduction. Runoff volume reduction can be accomplished in various ways including conversion of agricultural lands to grasslands, floodwater impoundment projects, wetland restorations, etc. Based on the hydrologic and hydraulic modeling completed for the District, goals have been set for the 10-year and 100-year flood.

The Buffalo-Red River Watershed District would like to provide 10-year protection to agricultural lands within the District per the goals of the Mediation Agreement. In order to provide this level of protection, there would need to be a 34 percent reduction in existing 10-year peak flows along the South Branch and Buffalo Rivers. This would reduce the existing 10-year flood to the current 5-year flood level.

The Buffalo-Red River Watershed District has adopted a goal to reduce the existing 100-year discharge on the Buffalo River to the existing 50-year flood discharge level. This would require a peak discharge reduction of about 22 percent.

100-year flood reduction goals were set utilizing both the information gained from the stacked hydrograph analysis and the Distributed Runoff Reduction (Storage) Analysis. Fifty percent of the overall storage goal was distributed within those subbasins with the greatest potential to contribute significantly to flood peaks on the lower Buffalo River and the remaining fifty percent of the runoff volume reduction was distributed based on the ratio of the subbasin drainage area to the contributing area of the Buffalo River.

Table 5.3 illustrates the goals for runoff volume reduction (or storage) within the BRRWD Planning Regions and major subbasins.

Table 5.3 Runoff Volume Reduction Goals

Planning Region/Major Subbasin	Runoff Volume Reduction (Acre-feet)			Runoff Volume Reduction (Inches)
Lakes Planning Region	**8,000**	**-**	**9,000**	**1.4 – 1.6**
Mainstem Planning Region	**33,000**	**-**	**34,000**	**2.0 – 2.1**
Becker County Ditch No. 15	11,000	-	12,000	
Hay Creek North	2,000	-	3,000	
Southern Planning Region	**23,000**	**-**	**24,000**	**2.5 – 2.6**
Deerhorn Creek	6,000	-	7,000	
Central Planning Region	**35,000**	**-**	**36,000**	**2.0 – 2.1**
Hay/Stony Creek	14,000	-	15,000	
Whisky Creek	8,000	-	9,000	
Northern Planning Region	**13,000**	**-**	**14,000**	**1.1 – 1.2**
Western Planning Region	**14,000**	**-**	**15,000**	**1.6 – 1.7**
Wolverton Creek	14,000	-	15,000	
Moorhead Planning Region	**No quantitative goal set – Maintain or reduced peak discharges**			

Note: Runoff Volume Reduction based on 100-year flood event.

The amount of runoff volume reduction (or storage) required within the BRRWD is highly dependent on the type, design, and location of future projects. Therefore, an estimate of required runoff reduction (or storage) is speculative and based on assumptions of what will be possible, practical, and acceptable. Based on engineering judgment, a preliminary runoff volume reduction (or storage) goal of 120,000 to 135,000 acre-feet has been adopted by the BRRWD Board of Managers. Runoff reduction goals should be updated with each new revised watershed management plan revision to reflect additional data and knowledge acquired since the previous management plan update. The runoff reduction goals proposed in this WMP are supportive of the goals set forth by the RRBC Basin Wide Flood Flow Reduction Strategy. The RRBC report contains a goal of 38,158 acre-feet for runoff volume reduction for the Buffalo River at Dilworth. The goals in **Table 5.3** exceed the RRBC's Flood Flow Reduction goals.

Peak Discharge rates for the existing and DFC were established for 10-year and 100-year discharge rates for 24-hour and 10-day rainfall events and are listed in **Table 5.4**

Table 5.4 Existing and Desired Future Conditions Peak Discharges

RAL ID	Indicator	Units	Rainfall Event			
			10-yr, 24-hr	100-yr, 24-hr	10-yr, 10-day	100-yr, 10-day
BR-1 / 09RD009	event peak discharge (cfs)	Existing	3,969	10,831	3,584	9,204
		DFC	2,620	8,448	2,365	7,179
BR-2 / BUFCLAY94	event peak discharge (cfs)	Existing	2,837	8,209	3,409	8,607
		DFC	1,872	6,403	2,250	6,713
BR-3 / BUFCR18	event peak discharge (cfs)	Existing	2,554	8,055	3,266	8,250
		DFC	1,686	6,283	2,156	6,435
BR-4 / BUFCR68	event peak discharge (cfs)	Existing	1,161	3,610	1,373	3,667
		DFC	766	2,816	906	2,860
BR-5 / HAW31	event peak discharge (cfs)	Existing	1,170	3,725	1,360	3,590
		DFC	772	2,906	898	2,800
HC-1 / 09RD003	event peak discharge (cfs)	Existing	184	499	133	343
		DFC	121	389	88	268
BCD-15 / 09RD004 / HAMDEN1	event peak discharge (cfs)	Existing	730	2,215	673	1,759
		DFC	482	1,728	444	1,372
BL-1	event peak discharge (cfs)	Existing	257	970	244	723
		DFC	170	757	161	564
SB-5 / BUFSB79	event peak discharge (cfs)	Existing	1,664	6,103	2,114	5,818
		DFC	1,098	4,760	1,395	4,538
SC-1 / STONY68	event peak discharge (cfs)	Existing	508	1,843	536	1,454
		DFC	335	1,438	354	1,134
SB-4 / BUFSB63	event peak discharge (cfs)	Existing	1,219	4,496	1,439	4,033
		DFC	805	3,507	950	3,146
WC-1 / 09RD008	event peak discharge (cfs)	Existing	692	1,863	595	1,461
		DFC	457	1,453	393	1,140
SB-3 / (BUFSB60-09RD008)	event peak discharge (cfs)	Existing	976	3,531	1,062	2,960
		DFC	644	2,754	701	2,309
SB-2 / BufUp	event peak discharge (cfs)	Existing	433	1,494	382	1,119
		DFC	286	1,165	252	873
DC-1 / DeerHW	event peak	Existing	702	2,458	550	1,675

	discharge (cfs)	DFC	463	1,917	363	1,307
WoVC-1	event peak discharge (cfs)	Existing	1,498	3,424	1,464	3,714
		DFC	989	2,671	966	2,897

Quantitative peak discharge rate reduction goals on the Red River have not been set. The BRRWD proposes to maintain or reduce their contribution to peak discharges on the Red River. The BRRWD has approximately 200 square miles of drainage area that contributes directly to the Red River. The remainder of the District enters the Red River via the Buffalo River. The District is supportive of the goals set forth by the Red River Basin Commission and the goals for the Red River and its tributaries as listed in the RRBC's Basin Wide Flood Flow Reduction Strategy.

5.2.2 Water Quality

The BRRWD focus relative to water quality includes the waterway systems of the District, the priority lakes (**Found in Section 4.2.9**), the quality of the fish populations, and biotic integrity at the RALs, and the sediment loads at the RALs. This focus is somewhat fluid because of the ongoing Total Maximum Daily Load (TMDL) efforts within the District and the District role in the completion and implementation of these TMDLs. When the ongoing TMDL is completed, the District plans to adopt the recommendations and goals from that study. The TMDL study and implementation plan for the Buffalo River is anticipated to be completed in the next 3 to 5 years.

Within this WMP, the District identifies priority lakes for management and restoration efforts. Establishing priority lakes is not intended to reflect a lack of concern for the other lakes within the District, but to bring attention to those lake resources with the greatest recreational use and to prioritize the District's lake management efforts. **Section 4.2.9** describes the existing conditions within District lakes. The DFCs for lakes are largely governed by water quality standards established by the MPCA. Although the water quality standards consist of narrative, nondegradation and numeric components, the numeric component is adopted as the goals and DFCs for the purposes of this WMP. The MPCA has established water quality standards for lakes, which vary by ecoregion and depend on whether a lake is defined as shallow or deep. **Table 5.5** shows the eutrophication water quality standards (and DFCs) for lakes within the BRRWD (**https://www.revisor.mn.gov/rules/?id=7050.0222**).

Table 5.5 Water Quality Standards for Lakes

Ecoregion / *Waterbody Type* **/** Parameter	**State Standard**
Northern Lakes and Forest Ecoregion	
Lakes, Shallow Lakes, and Reservoirs	
Phosporus, Total	30 ug/L
Chlorophyll-a	9 ug/L
Secchi Disk Tranparency	Not less than 2 meters
North Central Hardwood Forest Ecoregion	
Lakes and Reservoirs	
Phosporus, Total	40 ug/L
Chlorophyll-a	14 ug/L
Secchi Disk Tranparency	Not less than 1.4 meters
Shallow Lakes	
Phosporus, Total	60 ug/L
Chlorophyll-a	20 ug/L
Secchi Disk Tranparency	Not less than 1.0 meters

State standards may be challenging to achieve in practice depending of site specific watershed and lake conditions. The District may consider establishing alternative goals for its own management purposes, depending on a case-by-case basis. For example, District may consider establishing stringent goals when where a lake shows exceptional water quality and meets the state standard.

The goals and DFCs at stream and river locations include the numeric standards established by the MPCA (**https://www.revisor.mn.gov/rules/?id=7050.0220**). At the present time, the MPCA is in the process of consideration of differentiating water quality standards based on ecoregion or major river basin. If that change is made, the goals in this plan will change to reflect the new standards, if necessary. Numeric standards vary depending on the category class of the surface water. Many of the streams and rivers in the BRRWD are classified as either 2B or 2C waters. Standards for some parameters for Class 2B and 2C waters are listed in **Table 5.6**

Table 5.6 State Standards for Class 2B and 2C Waters

Parameter	State Standard
Turbidity	25 NTU
E. coli[#]	126 CFU per 100mL
pH	6.5 (minimum)/9.0 (maximum)
Dissolved Oxygen*	5.0 mg/L as daily minimum

[#]Note: *Escherichia (E.) coli* bacteria shall not exceed 126 organisms per 100 milliliters as a geometric mean of not less than five samples representative of conditions within any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters. The standard applies only between April 1 and October 31.

*Note: The dissolved oxygen standard may be modified on a site-specific basis according to MN Rules part 7050.0220, subpart 7, except that no site-specific standard shall be less than 5 mg/L as a daily average and 4 mg/L as a daily minimum. Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the $7Q_{10}$. This standard applies to all Class 2B waters

Consideration of the results of the Buffalo River Watershed Pilot Project (TMDL study) currently underway in the District will also likely result in changes to the water quality goals of this section. As a result, the water quality goals influencing decisions made by the BRRWD Board of Managers may change before the next plan update. As better information regarding water quality is developed, the District intends to use it.

With regard to ecological condition, the Index of Biotic Integrity (IBI) is an important parameter for describing existing conditions and DFCs. The MPCA conducted "intensive" monitoring in 2009 within the Buffalo River. This intensive monitoring included both fish and invertebrate surveys at several locations (more than 50 locations) within the Buffalo River watershed. The MPCA is presently pursuing the use of Tiered Aquatic Life Uses (TALU) for streams and rivers. This approach is likely to establish goals based on the IBI, which vary by stream classification. (This approach does not apply to drainage systems not considered public waters). Expectations are that final IBI will be established following the current intensive monitoring being completed within the BRRWD by the MPCA. However, some past work shows that an IBI Score of 41-50 reflects "good" conditions within the Lake Agassiz Plain ecoregion (http://www.pca.state.mn.us/water/biomonitoring/sf-ibi-lake-agassiz.pdf). Therefore, the District considers this as the minimum value for the IBI for natural streams and rivers.

The MN Department of Natural Resources conducted a stream survey on the Buffalo River and its tributaries in July and August of 2001 to assess the current condition of the fishery at that time. A copy of the Stream Survey Report published in 2003 is shown in **Appendix L**. Fish communities were sampled at 22 sites as part of that survey. In addition, stream

invertebrates were sampled in three locations . A geomorphic assessment including channel cross-sections, longitudinal elevations, and substrate pebble counts was also completed to arrive at the Rosgen classification for nine reaches within the Buffalo River watershed. Georeferenced benchmarks were left at each of these nine sites for future monitoring. Thirty-nine (39) fish species were survey in the Buffalo River watershed. In general, the biotic integrity at the sample locations was generally fair to "poor". One site on Whisky Creek with an IBI of 20 fell into the "very poor" category . An IBI of 12 to 20 is considered very poor for the Red River Basin. Eight stations had IBI values falling in the range of 21 to 30 in the "poor" category. Only two sample locations had IBI values in the greater than 40 "good" range. The remaining stations fell into the "fair" range with values of 31 to 40.

Total suspended solids and sediment loads and yields are the final parameters used by the BRRWD to describe existing water quality conditions and establish the DFCs within this WMP. Only select RALs are used for this criteria. Recent modeling completed by the BRRWD using the Soil and Water Assessment Tool (SWAT) model established existing loads and yields at select RALs (as well as loads and yields throughout the District). **Table 5.7** shows the existing total suspended solids loads and compares them to various scenarios to reduce loads. The amounts of permanent cover and wetland restoration established by this plan are reflected in the scenarios modeled. Therefore, the scenarios represent potential DFCs for total suspended sediment.

Table 5.7 Total Annual Sediment Load (U.S. Tons)

	Regional Assessment Location						
Management Scenario	**BR-1**	**BR-3**	**BR-5**	**SB-3**	**SB-5**	**SC-1**	**WC-1**
Existing Conditions	34,286	1,697	1,856	1,253	7,249	488	923
Baseline[#]	25,354	994	884	652	4,833	305	440
Filter Strips (5m)	28,373	1,305	1,365	877	5,442	322	557
Filter Strips (10m)	25,091	1,119	1,180	719	4,678	260	431
Wetlands (1%)	34,097	1,641	1,746	1,248	7,231	487	920
Wetlands (5%)	33,663	1,421	1,480	1,230	7,207	481	894
Wetlands (10%)	32,612	1,193	1,192	1,163	6,958	476	809
Permanent Cover (2%)	34,543	1,597	1,673	1,236	7,229	486	909
Permanent Cover (6%)	34,453	1,536	1,604	1,209	7,252	481	880
Permanent Cover (10%)	34,036	1,152	1,074	1,122	7,136	446	809

[#]Note: *Baseline conditions correspond to the year 1970. See Buffalo River Watershed Sediment Modeling for BMP Implementation. 2009, for more details on the SWAT modeling project.*

5.2.3 Stream Stability and Geomorphology

The existing condition of streams, rivers, drainage systems, lakes and wetlands is affected by the amount of sediment leaving fields and entering the watercourses. Recent work completed by Dr. Andrew Simon establishes reference conditions for stable streams, including a portion of the BRRWD (*Analysis of Bank Stability and Streambank Loadings along the South Branch Buffalo River, MN*, USDA-ARS, July 2009). The range of sediment yields reflecting "stable" conditions are adopted as the DFCs for stream stability and geomorphology. A comparison of alternatives and existing conditions based on the BRRWD's SWAT modeling effort are shown in **Table 5.8.** Stable conditions correspond to an annual yield of 0.0147 tons per acre.

Table 5.8 Total Annual Sediment Yield (U.S. Tons per Acre)

	Regional Assessment Location						
Management Scenario	**BR-1**	**BR-3**	**BR-5**	**SB-3**	**SB-5**	**SC-1**	**WC-1**
Existing Conditions	0.0525	0.0074	0.0098	0.0119	0.0248	0.0054	0.0189
Baseline	0.0388	0.0044	0.0047	0.0062	0.0166	0.0034	0.0090
Filter Strips (5m)	0.0434	0.0057	0.0072	0.0084	0.0187	0.0036	0.0114
Filter Strips (10m)	0.0384	0.0049	0.0062	0.0069	0.0160	0.0029	0.0088
Wetlands (1%)	0.0522	0.0072	0.0092	0.0119	0.0248	0.0054	0.0189
Wetlands (5%)	0.0515	0.0062	0.0078	0.0117	0.0247	0.0053	0.0183
Wetlands (10%)	0.0499	0.0052	0.0063	0.0111	0.0238	0.0053	0.0166
Permanent Cover (2%)	0.0528	0.0070	0.0088	0.0118	0.0248	0.0054	0.0186
Permanent Cover (6%)	0.0527	0.0067	0.0084	0.0115	0.0249	0.0053	0.0180
Permanent Cover (10%)	0.0521	0.0051	0.0057	0.0107	0.0245	0.0049	0.0166

[#]Note: *Baseline conditions correspond to the year 1970. See Buffalo River Watershed Sediment Modeling for BMP Implementation. 2009, for more details on the SWAT modeling project.*

5.2.4 Wetland, Forest, and Prairie

Permanent cover including wetland, forest, and prairie goals for the DFC were established by planning region, using information from Comprehensive Conservation Plan documents provided by the U.S. Fish and Wildlife Service. The established goals are based on the portion of the USFWS Wetland Management District within the boundary of the BRRWD. The acreage goals are focused geographically within the beach ridge portions of the BRRWD and are shown in **Table 5.9**. The existing acreages are also shown with **Table 5.9**

Table 5.9 Existing and Desired Future Condition for Permanent Cover

	Existing Condition		Desired Future Condition		Change
	acres	percent	acres	percent	acres
Western Planning Region					
Total acres in the Western Planning Region	105,331	100			
Cultivated Land	99,495	94.5	99,285	94.3	-210
Permanent / Planted Cover	4,248	4	4,458	4.2	210
All Wetlands	155	0.1	194	0.2	39
Grassland & Grassland Shrub	1,105	1	1,125	1.1	20
Wooded Riparian Corridor & Deciduous Forest	2,678	2.5	2,809	2.7	131
Conservation Reserve Program	799	0.8	799	0.8	0
New Ditch System Buffer Strips (5.0 miles)					20
Lakes Planning Region					
Total acres in the Lakes Planning Region	67,894	100			
Cultivated Land	15,183	22.4	15,078	22.2	-105
Permanent / Planted Cover	51,361	75.6	51,466	75.8	105
All Wetlands	6,338	9.3	6,377	9.4	39
Grassland & Grassland Shrub	6,679	9.8	6,741	9.9	62
Wooded Riparian Corridor & Deciduous Forest	29,409	43.3	29,409	43.3	0
Conservation Reserve Program	1,655	2.4	1,655	2.4	0
New Ditch System Buffer Strips (1.0 miles)					4
Moorhead Planning Region					
Total acres in the Moorhead Planning Region	39,998	100			
Cultivated Land	29,761	74.4	29,656	74.1	-105
Permanent / Planted Cover	2,579	6.4	2,684	6.7	105
All Wetlands	53	0.1	53	0.1	0
Grassland & Grassland Shrub	788	2	788	2	0
Wooded Riparian Corridor & Deciduous Forest	1,548	3.9	1,653	4.1	105
Conservation Reserve Program	6	0	6	0	0
New Ditch System Buffer Strips[(1)]					0
Northern Planning Region					
Total acres in the Northern Planning Region	144,224	100			
Cultivated Land	126,319	87.6	125,585	87.1	-734
Permanent / Planted Cover	15,120	10.5	15,854	11	734
All Wetlands	1,215	0.8	1,530	1.1	315
Grassland & Grassland Shrub	7,305	5.1	7,565	5.2	260
Wooded Riparian Corridor & Deciduous Forest	5,379	3.7	5,510	3.8	131
Conservation Reserve Program	5,693	3.9	5,693	3.9	0
New Ditch System Buffer Strips (7.0 miles)					28

	Existing Condition		Desired Future Condition		Change
	acres	percent	acres	percent	acres
Southern Planning Region					
Total acres in the Southern Planning Region	112,301	100			
Cultivated Land	97,366	86.7	96,317	85.8	-1,049
Permanent / Planted Cover	12,744	11.3	13,793	12.3	1,049
All Wetlands	1,911	1.7	2,305	2.1	394
Grassland & Grassland Shrub	7,693	6.9	8,348	7.4	655
Wooded Riparian Corridor & Deciduous Forest	2,534	2.3	2,534	2.3	0
Conservation Reserve Program	11,287	10.1	11,287	10.1	0
New Ditch System Buffer Strips (8.0 miles)					32
Central Planning Region					
Total acres in the Central Planning Region	209,252	100			
Cultivated Land	158,898	75.9	158,059	75.5	-839
Permanent / Planted Cover	39,551	18.9	40,390	19.3	839
All Wetlands	5,859	2.8	6,253	3	394
Grassland & Grassland Shrub	17,263	8.2	17,668	8.4	405
Wooded Riparian Corridor & Deciduous Forest	12,547	6	12,547	6	0
Conservation Reserve Program	25,432	12.2	25,432	12.2	0
New Ditch System Buffer Strips (10.0 miles)					40
Mainstem Planning Region					
Total acres in the Mainstem Planning Region	195,123	100			
Cultivated Land	136,025	69.7	135,500	69.4	-525
Permanent / Planted Cover	47,253	24.2	47,778	24.5	525
All Wetlands	7,119	3.6	7,434	3.8	315
Grassland & Grassland Shrub	19,943	10.2	20,117	10.3	174
Wooded Riparian Corridor & Deciduous Forest	12,607	6.5	12,607	6.5	0
Conservation Reserve Program	6,832	3.5	6,832	3.5	0
New Ditch System Buffer Strips (9.0 miles)					36

(1) All legal ditch systems in the Moorhead Planning Region currently have the state mandated one-rod grassed buffer strip.