

Decision support tool for selecting alternative management practices in compliance with the Minnesota Buffer Law

Quick Start Guide

Step 1: Selecting Baseline Site Conditions There are 6 variables within the tool that can be altered with drop-down lists to identify baseline site conditions. These variables, highlighted in yellow in the tool, will determine the expected sediment and phosphorus export and also the effectiveness of a prescribed buffer in a field or parcel in question.

1. **Agroecoregion** – there are 30 agroecoregions to select from in the state. These regions represent spatial units with similar soil, climatic, and landscape characteristics that affect sediment and phosphorus export. A map index was disseminated along with the decision support tool. This index allows you to first find the region of the state you are in, then locate the parcel in question and determine which agroecoregion boundary it is within based on the map legend on the final page of the index. If the map index boundaries are too coarse to accurately determine your agroecoregion, a GIS shapefile can be obtained online at: <https://gisdata.mn.gov/dataset/agri-agroecoregions>. If you are within 1000 feet of multiple agroecoregions or a parcel crosses more than one region, either agroecoregion can be selected.
2. **Current management condition** – this variable is comprised of 6 different categories of management practices: tillage method and orientation, fertilizer rate, fertilizer and manure incorporation method, and amount of residue cover. Each category has three different management levels: “Poor”, “Average”, and “Best” along with management practice examples that correspond to each category and each level. A table of these practice examples can be found on the “Management Condition Ex.” tab within the excel tool. To qualify for best management condition, all practice examples being employed on the site in question must match the best category. To qualify for the average management condition, all practices employed on the field in question must be in the average or best category. Finally if any of the poor management practice examples are being employed on the site in question, the poor management category must be selected. In other words, the management condition selected must match the poorest practice example that is being employed on the field in question.
3. **Riparian Berms** – this option shall only be selected where water is prevented from entering surface waters via overland flow because it is interrupted by a riparian berm. Berms must be present on all surface waters for the field in question to be considered for this option. When riparian berms are not in place, uniform overland sheet flow is assumed.
4. **Buffer width required** – this variable differentiates what type of surface water feature flows through the field in question. The Minnesota DNR has delineated the state’s surface waters into “Public Waters” and “Public Ditches”. The map for this delineation can be found online at: <http://arcgis.dnr.state.mn.us/gis/buffersviewer/>.
5. **Average field slope** – this variable refers to the average field slope of the entire field in question. It can be determined by an on-site analysis, or with spatial elevation data. Elevation

data can be acquired for the entire state online at:

<http://www.mngeo.state.mn.us/chouse/elevation/raster.html>

6. **Soil Texture** – this variable must be determined at one of three levels: fine (clay loam, silty clay loam, silt), medium (loam, very fine sandy loam, silt loam), or coarse (sandy loam, sandy clay loam). An on-site analysis can be used to determine the average soil texture or soil data is available statewide online via the web soil survey:

<https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MN>.

Step 2: Alternative BMP Choices There are 12 best management practices offered as potential alternatives to a buffer. Let it first be understood that this tool does not recommend removing buffers altogether. The tool cannot yield a satisfactory result unless a reduced width buffer is selected and a width is chosen from the drop down menu.

To experiment with different BMP choices, use the yellow check boxes to check a box near a particular BMP or leave it unchecked. A checked box implies that particular BMP will be installed, and the site specific sediment and phosphorus reductions will be added to the total at the bottom of the tool. When a reduction is not listed in a certain row, it is implied that the BMP is not recommended or is not effective in the Agroecoregion selected in Step 1. When a total reduction equal or greater than that of a buffer is achieved, the “Acceptable BMP combination” dialog box will turn green and output a “YES” or satisfactory result. Both sediment and phosphorus reductions must be deemed acceptable by this tool to yield an acceptable combination of practices.

BMPs that are not installed on the entire field are differentiated by the tool as “Trapping and Controlling” practices. These practices require manual input of a percentage of field runoff affected by the particular practice in question. For example, if a Water and Sediment Control Basin is installed in the upland portion of a field in question, yet it only collects and treats 25% of the runoff generated by the field, 25 should be manually entered in the yellow dialog box in the Water and Sediment Control Basin row. It is assumed in this example that 75% of the field runoff is not intercepted or does not flow into the Water and Sediment Control Basin. This refers to only the parcel in question, not upland areas that cross landowner boundaries.