



Bondurant, Iowa

Stream Buffer Mapping

Completed by ICIGO at the University of Iowa as part of the Iowa Initiative for Sustainable Communities (IISC) 2023-24 partnership with the City of Bondurant.

May 2024

Introduction

The stream buffer maps created were in reference to Chapter 167 in Bondurant’s city code. Buffers were added to stream and flood data from USGS and FEMA to the specifications listed in section 167.04.

Data

The flood mapping data was from FEMA. In their database, FEMA provides 100-year and 500-year floodplains for the entire US. It was last updated on September 27, 2023. This data was obtained from Arc GIS’s Living Atlas. The unedited data can be found at this site:

https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/USA_Flood_Hazard_Reduced_Set_gdb/FeatureServer

The stream and wetland data are from the National Hydrologic Dataset (NHD), which is run by USGS. It was last updated on May 8, 2023. This data set is updated more regularly than USGS’s 7.5-minute maps requested in the code. The City of Bondurant provided Bondurant’s city boundaries. The unedited version of this data can be found at this site:

<https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/NHDPlusV21/FeatureServer>

Methods

First, the city code was examined to determine what data and data manipulation was needed. Most decisions came from Table I and II found in section 167.04, listed below. The colors added to the tables correspond with the colors on each stream buffer map in the figures section.

Table I. Required Minimum Stream Buffer Width

Type	Buffer Width
Where Floodway Exists	Floodway plus 50 feet
No Floodway	DNR Method
All others	30 feet

Table II. Maintenance Access Distances

Stream Type	Additional Width of Buffer	Sides of Buffer
Type I	20 feet	Both
Type II	20 feet	Both
Type III	15-20 feet	One Side

Along with these tables, section 167.02.5 was referenced for the 'Iowa DNR Method' where no floodway existed. Here, it stated it was a "50-foot-wide undisturbed buffer on each side of the near-stream zone (the stream's belt width)."

After this, the data was found and manipulated to fit Bondurant's code requirements. FEMA's flood map contained multiple flood types for the entire United States. The span of the NHD map was also country wide. Each of these datasets was clipped to an area slightly larger than Bondurant using ArcGIS Pro's (Arc) select-by-location tool. After this, the necessary attributes within the data were isolated. In the FEMA flood map, all polygons outside the 0.2% annual flood chance (500-year flood) were grouped as a 100-year flood map using Arc's select by attribute tool. In the NHD map, each water body was grouped following Bondurant's code using the same tool. The 'all-others' group included all wetlands and Type 4 streams and smaller.

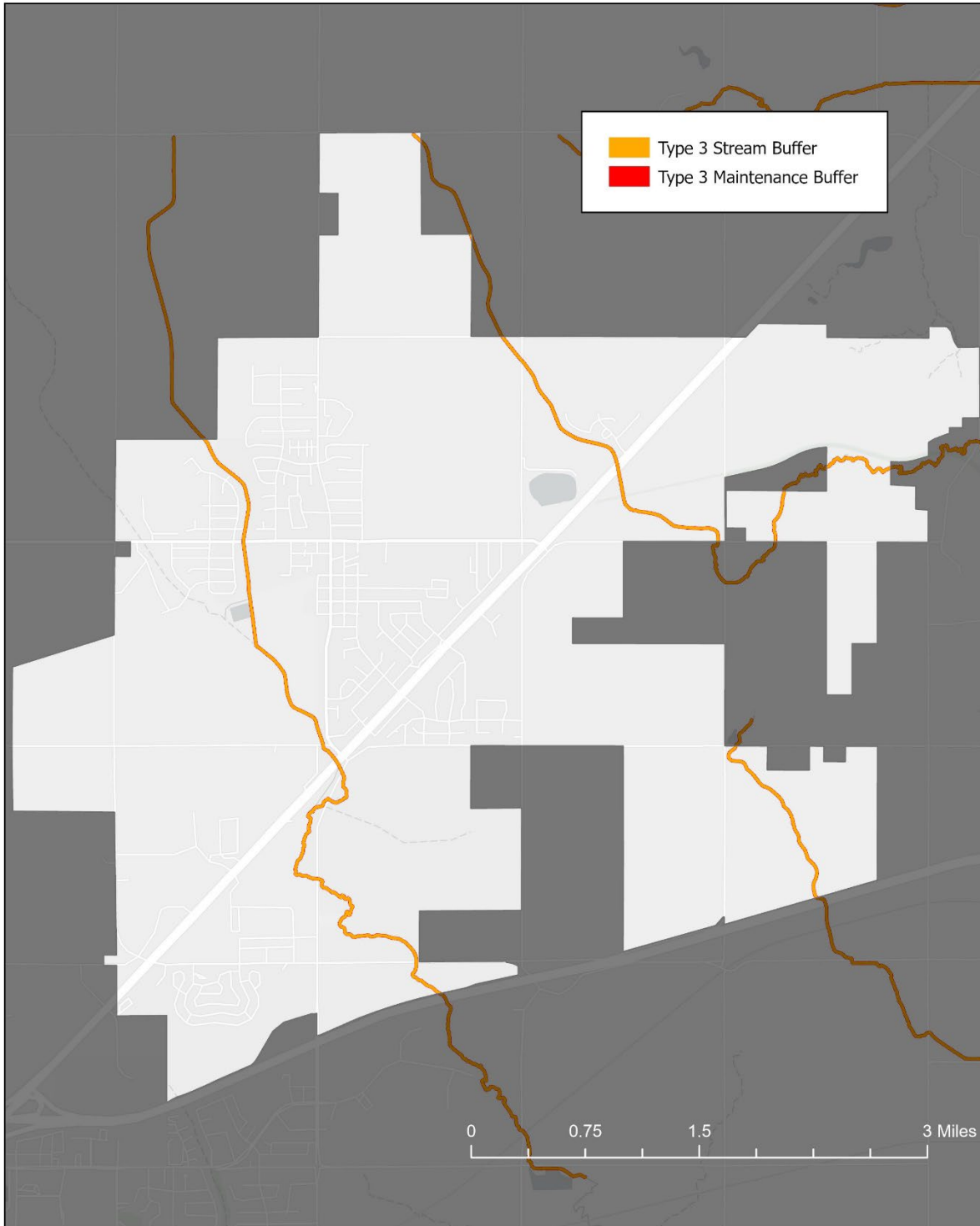
Once the data was extracted from the initial primary sources, the buffers were added onto each layer as specified in the code with one exception, Type III streams. A buffer was added to both sides of these streams. Bondurant officials should ultimately decide what side of the streams the buffer should lie on.

Deliverable

The entire dataset is split between three cartographic maps for simplification. One map shows the floodplain and wetlands buffers within Bondurant's corporate limits. A second map shows the stream buffers within the same area. The third map shows all buffers within Bondurant's future planning boundary. All data can be found on Arc Online at the following link.

<https://uiowa.maps.arcgis.com/home/item.html?id=745957329d3e405b92e65a55a10b14da>

Stream and Maintenance Buffer to Code, Bondurant



Stream and Maintenance Buffer to Code, Greater Bondurant

