

Land Prioritization Mapping for Protecting Drinking Water Quality

Eight drinking water suppliers collaborated to rank land parcels to protect drinking water quality. Participating utilities included (in order from upstream to downstream) Berkeley County Public Service Water District, Frederick County Division of Water and Sewer Utilities, the Town of Leesburg Department of Utilities, Loudoun Water, Fairfax Water, Washington Suburban Sanitary Commission (WSSC Water), Washington Aqueduct, and DC Water.

The project area encompassed the non-tidal Potomac basin above the DC metro drinking water supply intakes. Within the study area, agricultural and forested lands, as well as riparian areas protected by county ordinance, were considered “opportunity areas” for prioritization.¹ Land parcels were prioritized using seven metrics. Six metrics were equally weighted, while the seventh metric, karst transmissivity, received half the weight of the other metrics.

METRICS AND RATIONALES:

Distance from Waterways

Areas closer to the waterway are more likely to impact downstream drinking water quality.

Distance from Surface Water Intake Weighted by 24-Hour Travel Time

Areas closer to intake locations throughout the basin are more likely to impact drinking water quality. In addition, areas closer to the DC metro utilities may potentially impact larger populations in a shorter amount of time.

Distance from Urban Areas

Areas closer to urban areas are more likely to be impacted by urban land use activities like winter salt applications and are at greater risk of spills at road-stream crossings.

Karst Transmissivity

Areas with higher transmissivity are higher priority as they convey contaminants more readily.

Future Land Use (Year 2025)

Protecting lands expected to be forested or agricultural in 2025 are given priority to minimize the impacts of future urbanization.

Preserving Existing High-Quality Streams

Areas close to high-quality streams are given priority to protect these resources.

Buffer Regulations

Riparian areas in counties without stream buffer regulations are prioritized as there is not an existing regulatory effort for protection, leaving them more vulnerable to activities that may impact downstream drinking water quality.

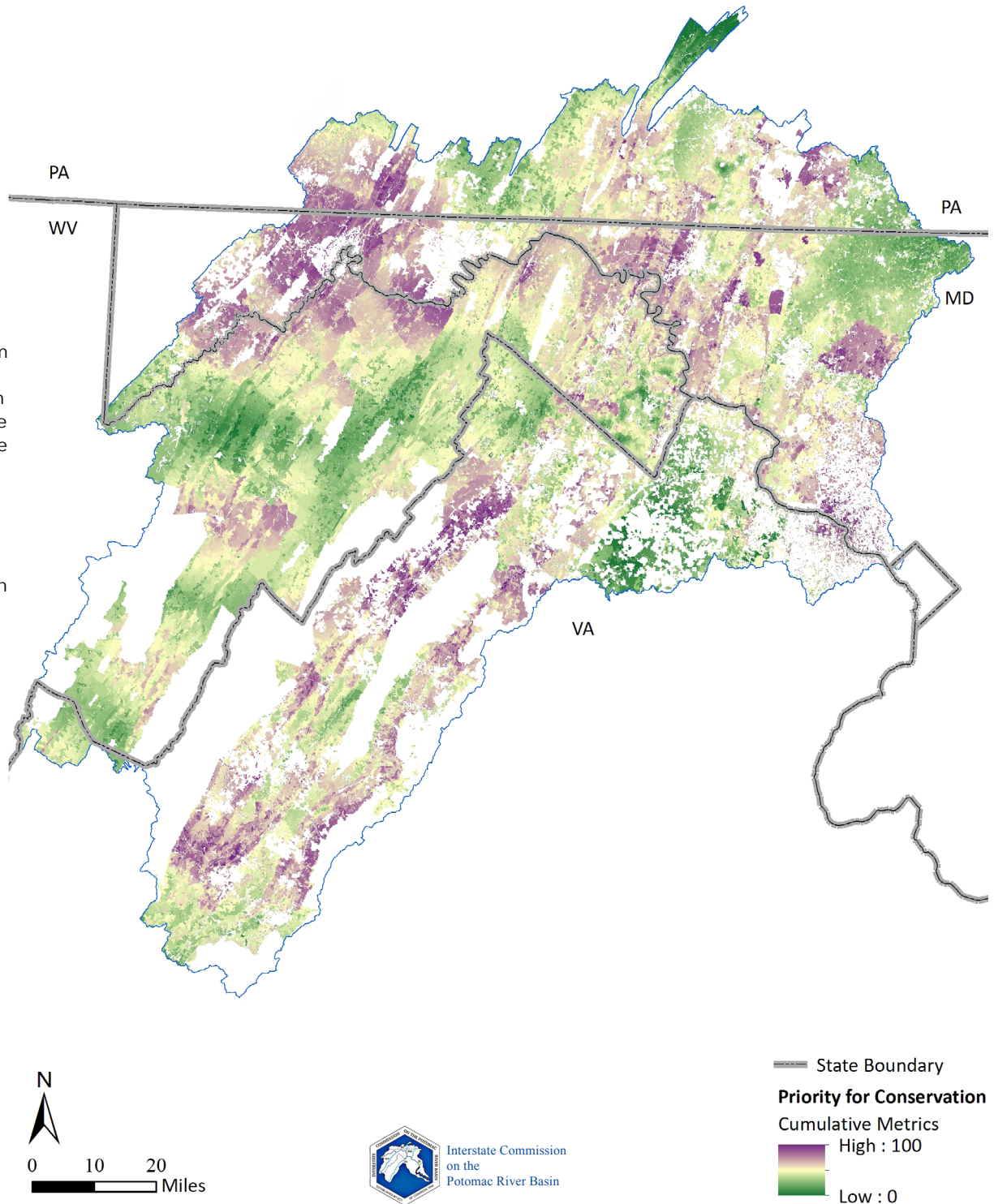
¹ Already protected lands like easements and government-owned lands in the study area were excluded from the opportunity areas.

PRIORITY PARCELS FOR CONSERVATION

The analysis indicates that there are a total of 621 parcels comprising 3,737 acres of high-priority² land in the study area (**Figure 1**). **Table 1** provides the distribution of the high-priority forested and agricultural lands by basin jurisdiction. High-priority land makes up 0.05 percent of the study area and 0.08 percent of the opportunity area.

FIGURE 1

Priorities for land conservation from a drinking water source protection perspective at the parcel scale in the Potomac basin. Higher-priority parcels are shown in purple. Lower-priority parcels are shown in green.



² For the purposes of this summary, "high priority" is considered a cumulative value of greater than or equal to 75. However, the cumulative values range from 0-100, and users may want to evaluate their own threshold for action. Users are encouraged to obtain the GIS layers and identify local high-priority areas based on their own threshold of interest.

TABLE 1
High-Priority Forested and Agricultural Lands in the Potomac Basin by Jurisdiction

Jurisdiction	# Counties	High-Priority Forest		High-Priority Agriculture		High-Priority TOTAL	
		# Parcels	Acres	# Parcels	Acres	# Parcels*	Acres
Maryland	4	60	213	22	27	61	240
Pennsylvania	3	12	139	41	15	41	154
Virginia	9	443	2,683	258	499	445	3,181
West Virginia	8	73	150	21	11	74	161
TOTAL	24	588	3,185	342	552	621	3,737

**The total number of high-priority parcels may not equal the number of high-priority forest parcels plus the number of high-priority agricultural parcels because some parcels include both high-priority forest and high-priority agriculture.*

TO LEARN MORE

Products of this study, including the geospatial files, a technical memo, and this project flier, are available. Visit the [ICPRB website](#), [DWSPP website](#), or [contact us](#) for more information.

ACKNOWLEDGMENTS

Stakeholder engagement was essential in developing the land prioritization scheme to ensure that the final products reflect the source water protection priorities of the participating water utilities and are readily available for implementation by land conservation groups, Potomac basin jurisdictions, and other interested parties. ICPRB staff would like to thank all those that have contributed to this effort.

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