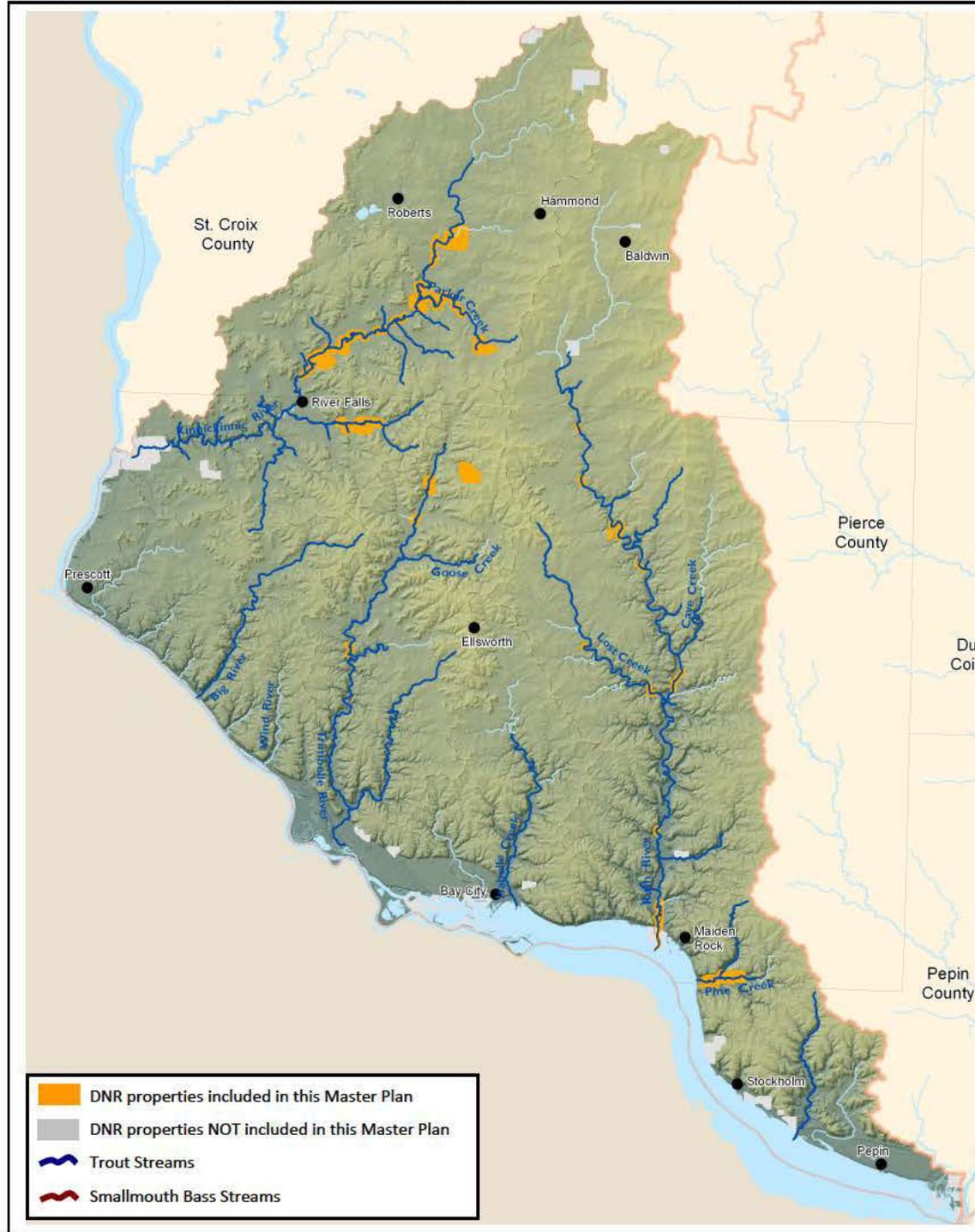


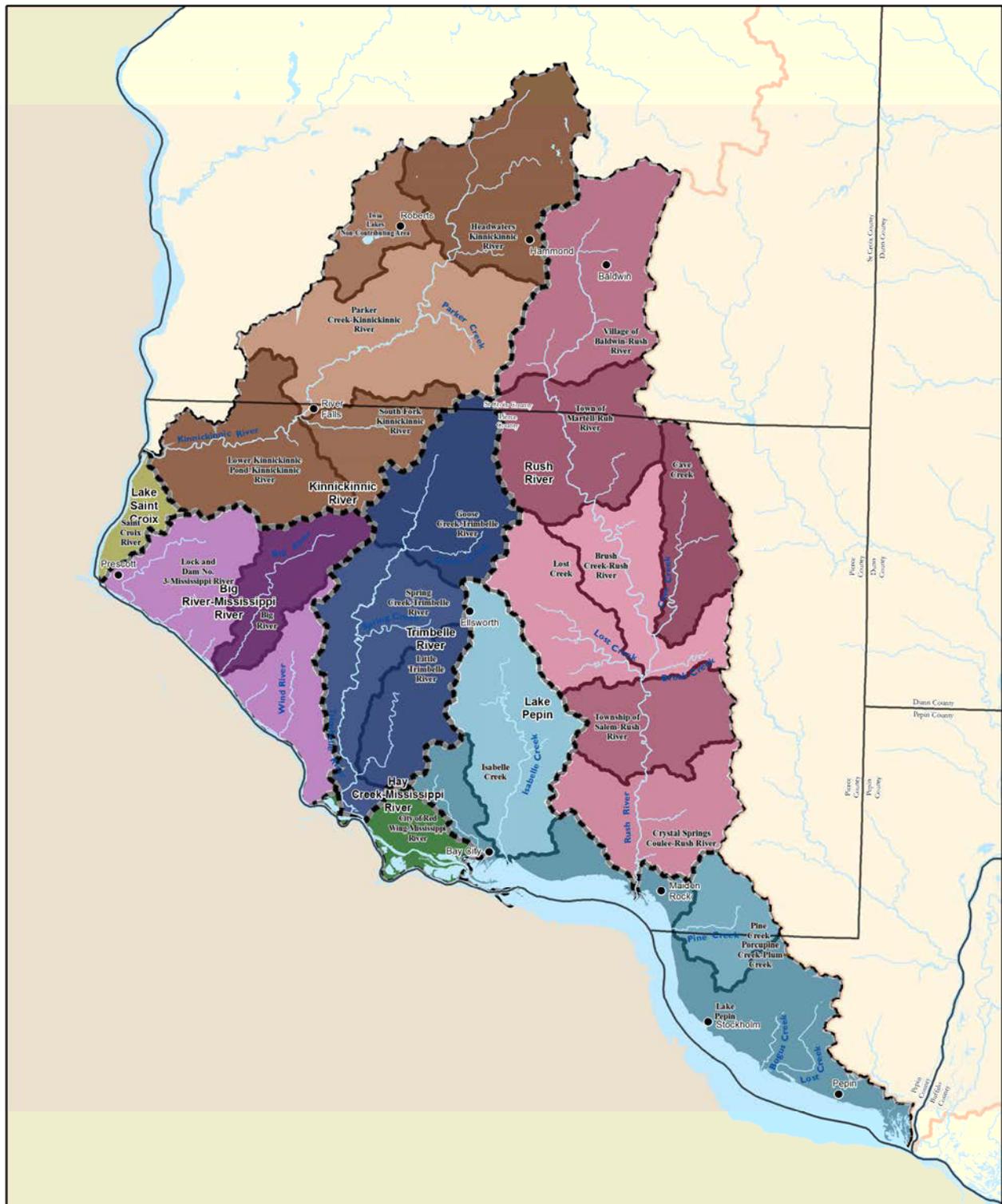
CHAPTER 3: KINNICKINNIC RIVER REGION

Figure 3.1: Map of DNR properties included in the master plan of the Kinnickinnic River Region.



Note: Most of the properties included in this master planning process are narrow strips along trout and smallmouth bass waters and cannot be seen at the scale of this map. To enable readers to see the properties, their boundaries have been significantly exaggerated.

Figure 3.2: Watersheds and Sub-Watersheds of the Kinnickinnic River Region.



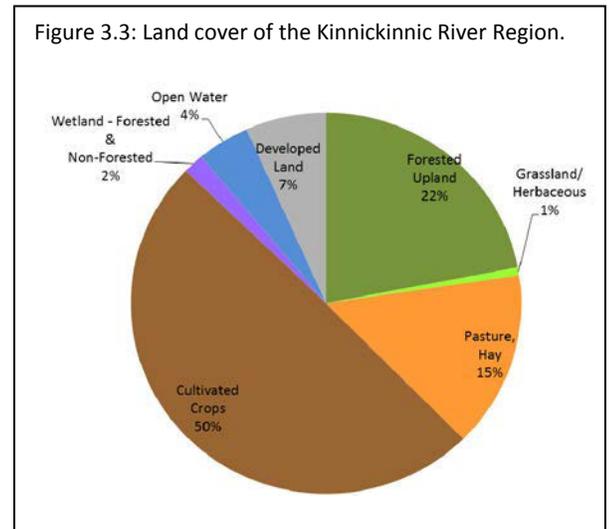
1. OVERVIEW

a) Physical Environment

Sitting at the northwestern edge of the Driftless Area, the “Kinni” Region exhibits both glaciated and unglaciated characteristics. The broad rolling plains of the northern portion (a function of previous glacial periods as well as the Wisconsin Glaciation) are cut by incised valleys carved by streams flowing to the St. Croix and Mississippi Rivers. Soils are predominantly formed in loamy till glacial deposits, while some are in outwash. A loess cap of wind-deposited silt is 6 to 48 inches thick over the surface. River bottoms are moderately well drained to poorly drained silty soils with a silt loam surface over calcareous and non-calcareous silty alluvium or loess.

b) Land Cover and Use

This Planning Region is primarily dominated by agriculture with the majority in row crops (Figure 3.3). Many of the streams in the southern portion of the region flow through partially or fully forested coulees. With the increasing price of corn and soybeans over the last decade, many pastures, hayfields, and lands that were enrolled in the Conservation Reserve Program (CRP) are being converted to row crops. This large conversion out of permanent vegetation to agricultural uses that expose open soil is also likely to have an adverse effect on water quality of streams in the region. In addition, over the last decade, residential development has increased dramatically in the western part of the Ecological Landscape along and near the St. Croix River. Many new residents commute to the Twin Cities for work.



The major forest types are maple-basswood and oak-hickory, with lesser amounts of lowland hardwoods. Native coniferous forests are rare, and are limited to a few tamarack swamps and small scattered stands of pine on steep rocky slopes.

c) Terrestrial Habitats

Grassland management at multiple scales is a major opportunity in the Western Prairie and will only benefit water quality in the watershed. Small, scattered remnants of native prairie exist here along with substantial areas of "surrogate grassland" that now provide increasingly critical habitat for many grassland species, especially birds. The largest grassland management project in this region is the Western Prairie Habitat Restoration Area in St. Croix and Polk counties. By managing at multiple scales, large blocks of surrogate grassland, unplowed prairie pastures, small native prairie remnants on bluffs or within rights-of-way and working agricultural lands can all play key roles in the conservation and restoration of the grassland ecosystem that historically covered most of this ecological landscape. Ponds and lakes border or are embedded within some of the areas with high grassland management potential; these add great value for species that nest near or over water and for migrants that use open wetlands and water.

Additional natural community types found in this region include southern dry, dry-mesic, and mesic forests, floodplain forest, emergent marsh, and dry cliff. Less common to rare natural communities include moist cliff, southern sedge meadow, dry prairie and oak opening. In addition to the dry prairie and surrogate grassland opportunities mentioned above, the region is also noteworthy for its' southern mesic forests and moist cliffs. High

quality natural communities of Driftless Area study stream properties can be found in Appendix C of the “Rapid Ecological Assessment for Driftless Area Streams” (Appendix 2).

d) Aquatic habitats

Despite the intensive nature of row crop agriculture, cold water fish communities throughout the watershed have shown steady improvement during the last two decades. Many streams in the past were dependent on stocking of trout to sustain sport fisheries. However, since records were first kept in the 1950s, self-sustaining brook and brown trout populations have expanded both in distribution and abundance. Today, this watershed boasts some of the highest densities of self-sustaining brook and brown trout streams in Wisconsin. In addition, many streams have shifted from warm/cool water fish assemblages to cool/cold water fish assemblages. Much of this is due to improvements in agricultural practices on the landscape, major decreases in grazing along streams, precipitation changes and DNR land acquisition and trout stream habitat improvement.

Currently, the Kinnickinnic River is listed as an Outstanding Resource Water under the Clean Water Act. The St. Croix, Big, and Trimbelle rivers, along with Rocky Run, are listed as Exceptional Resource Waters. The Lower St. Croix River is designated as a National Scenic Riverway and supports an exceptionally high diversity of aquatic organisms, including fish, mussels and other invertebrates. Many rare species have been documented there, and several of the mussels are globally rare. The river's floodplain contains good examples of emergent marsh, wet prairie and floodplain forest.

Note: Detailed descriptions of the sport fishery can be found in the next section. A more complete discussion of the aquatic features and water management goals can be found in the watershed basin reports developed by the DNR.¹

e) Endangered, Threatened, and Special Concern Species

As mentioned, the region's prairies and grasslands harbor important grassland bird populations, many of which are rare or declining. Maintaining these lands in permanent grass cover will benefit bird, insect, and other rare upland species. By reducing run-off, large grasslands will also help maintain high quality water flows and associated aquatic species.

To date, there are 26 known rare species that occur within the study stream properties of this region. Included within this list are 4 birds, 12 fish, 8 invertebrates, and 2 plants. Of these, 6 are state Endangered, 7 are state Threatened, and 13 are special concern. For a complete list of these species by property see in Appendix C of the “Rapid Ecological Assessment for Driftless Area Streams” (Appendix 2). For an explanation of the state and global ranks, as well as state status, see Appendix A of the “Rapid Ecological Assessment for Driftless Area Streams.”

f) Invasive Species and Other Species of Management Concern

Currently, reed canary grass, buckthorn and box elder dominate many previously grazed stream corridors within the region. Such invasions have limited stream accessibility and degraded stream banks. Control of these invasive plants will continue to present challenges to managing riparian habitat along trout streams well in into the future.

Although there is direct access from the St. Croix and Mississippi Rivers, there is limited concern over Asian Carp or other exotic species migrating up the smaller, cold water Kinnickinnic River Region watersheds.

¹ Watershed Basin Reports are posted on the DNR's web (dnr.wi.gov); search for “basins.”

g) Social and Recreation Issues

This Planning Region is easily accessible to residents of the Twin Cities and surrounding communities, and as a result the streams in the Kinni River Region with public access tend to receive heavy fishing pressure. In particular, the Kinnickinnic and Rush river systems receive exceptionally heavy fishing pressure.

h) Cultural Resources

Archaeological sites representing all of the recognized prehistoric culture periods are found throughout the region, from Paleo-Indian (10,000-8,000 BC), through Archaic (8,000-500 BC), Woodland (500 BC-1000 AD), and Oneota (1000-1650 AD). Associated sites include Native American camps, villages, burial mounds, rock art, shell middens, and more. Although present, the area evidences relatively few animal-shaped effigy mounds. Large Mississippian-era sites, some of the northernmost recorded, are found in Pierce County and surrounding areas.

Historic period archaeological sites (ca. 1650-present) include farmsteads, iron mines, dams, sawmills, cemeteries, and others. The area's river towns, villages, and rural roads are dotted with many historic homes, businesses, bridges, and other early structures, many used continuously to this day.

Whether populated by ancient Indian peoples or more recent arrivals, the area's numerous archaeological sites and historic structures reflect a lengthy record of settlement, as well as intensive utilization of the diverse water, mineral, plant, animal, and other resources characteristic of the region.

2. PUBLICLY ACCESSIBLE LANDS in the KINNICKINNIC RIVER REGION

The Kinnickinnic River Region has a variety of public and private conservation lands open to the public. The Kinnickinnic River Fishery Area, the Upper Kinnickinnic Streambank Protection Area, and the Western Prairie Habitat Restoration Area (WP HRA) lie in the headwaters of the Kinnickinnic River Watershed. The Kinnickinnic River Fishery Area contains 350 acres in fee and 155 acres in easements. The Stream Bank Protection Area includes 853 acres of fee title lands on the main stem of the Kinnickinnic River, Parker and the South Fork of the Kinnickinnic River. Further headwater protection is offered by the St. Croix County School Forest. The state fishery area connects to the northern edge of the City of River Falls. Within the City of River Falls is the White Kinnickinnic River Pathway. Downstream of River Falls within the canyon is Glen Park, River Falls School Forest, numerous parcels owned and eased by Kinnickinnic River Land Trust and, near the mouth, Kinnickinnic River State Park.

Public ownership in the Lake Pepin Watershed is limited to the Pine Creek Fishery Area. This property consists of several hundred acres of scattered fish habitat once owned by West Wisconsin Land Trust.

The DNR owns some parcels as part of the WP HRA in the headwaters of the Rush River. On the main stem of the Rush, West Wisconsin Land Trust owns several small parcels open to the public and the DNR owns about 41 acres under the Streambank Protection program or Fishing Path Initiative easements. Some of these easements are located on Lost Creek. Two individual parcels ½ to ¾ mile long are open to anglers and are owned by Eau Galle Rush River Sports Club and the Ellsworth Rod and Gun Club. The Town of Martell has several parking areas and a small park open to anglers on the Rush River. The Army Corp of Engineers recently purchased hundreds of acres on the lower end of the Rush River which is connected to the Rush River Delta Natural Area by DNR fisheries land.

The Trimbelle River watershed has several parcels in public ownership. The Army Corp of Engineers recently purchased a large tract of land in the headwaters which connects to DNR land, known locally as the Ray Morrison Wildlife Area. This is mostly wetland along the stream corridor. In addition, there is a DOT mitigation site just downstream of CTH W, a Town of Trimbelle Park near STH 10 and the DNR owns several Streambank Protection easements on the Trimbelle River main stem.

Less well-known is the amount of temporary (20-25 years) county conservation easements scattered throughout the region and open to the public for recreation.

a) DNR and other public and private conservation lands²

i) *By Watershed and sub-watershed (acres):*

Properties included in this Master Plan																
Fisheries Management Program											Wildlife Program	End. Resources Program	TOTAL for properties included in this Master Plan	Other DNR Lands	Other Public & Private Conservation Lands**	TOTAL
State Fishery Areas		Remnant Program		Streambank Protection		Scattered Habitat		Other*								
Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease							
Hay Creek - Miss. River																
0	0	0	0	0	0	0	0	0	0	0	0	0	0	752	2	754
City of Red Wing - Miss. River																
														752	2	
Kinnickinnic River																
350	155	0	0	853	0	0	7	0	0	0	0	0	1,364	594	730	2,688
South Fork Kinnickinnic River																
				267											1	
Lower Kinni. Pond - Kinni R																
														40	445	
Parker Creek - Kinni. River																
350	155			445			7								90	
Headwaters Kinni. River																
				141										554	194	
Lake Pepin																
0	0	5	0	0	0	234	0	0	0	0	0	0	239	1,769	0	2,008
Pine Creek																
		5				232										
Lake Pepin																
						3								1,721		
Isabelle Creek																
														48		
Lake Saint Croix																
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Saint Croix River																
														1		
Rush River																
0	0	0	0	0	41	38	0	0	0	0	0	0	80	280	31	391
Town of Martell - Rush River																
					4										5	
Brush Creek																
					30											
Lost Creek																
					7											
Crystal Springs Coulee - Rush R.																
						38								104		
Village of Baldwin - Rush River																
														176	26	
Trimbelle River																
0	0	0	0	0	17	0	0	123	0	91	0	231	62	0	293	
Goose Creek																
					6			123		91						
Spring Creek - Trimbelle River																
					11									62		
TOTAL																
350	155	5	0	853	58	272	7	123	0	91	0	1,914	3,458	763	6,135	

* Includes nonpoint easements, wetland mitigation sites, watershed management projects, public access sites, gift lands, and rearing stations.

** Includes conservation lands owned and eased by federal agencies, counties, private conservation groups and other similar organizations, as described in the Protected Areas Database housed in the Conservation Biology Institute (<http://databasin.org/protected-center/features/PAD-US-CBI>).

² Watersheds and sub-watersheds without any DNR lands are not listed.

ii) By DNR Property (acres):

	Fee	Easement	Total
Fish Management Program			1,823
State Fishery Areas			
KINNICKINNIC RIVER FISHERY AREA	350	155	505
Remnant Habitat Projects			
REM-PINE CREEK	5	-	5
Stream Bank Protection	853	58	911
Other*	396	7	402
Natural Areas Program			-
None			
Wildlife Management Program			91
Scattered Habitat, Statewide Habitat, Scattered Forest, and Extensive Habitat lands	91	-	91
Total	1,694	220	1,914

* Includes nonpoint easements, scattered habitat lands, wetland mitigation, watershed management projects, public access sites, gift lands, and rearing stations.

b) Habitat management of DNR lands.

i) In-stream management

In stream habitat work in this region follows the objectives and strategies described in Chapter 2.

ii) “Backland” habitat management

Given the scale limitations of available geospatial land cover data, it is not feasible to accurately describe the land cover in most of the Department’s land holdings that are small and narrow. As such, the following section simply lists the habitat types that are present on the properties in the Kinnickinnic River Region that are covered in this master plan and their approximate coverage, based on property managers’ estimates.

Habitats Present	Approx. Coverage
Prairies, grasslands, and oak opening (savanna) habitats	20%
Wetlands (inc. lowland forests)	70%
Forests (upland)	5%
Agricultural lands – row crops, pastures, hay fields	5%
	100%

These habitats are managed following the strategies described in Chapter 2, unless noted below.

iii) Description of any unique management strategies/techniques/goals used in this region.

Stream restoration activities are quite diverse across the region and range from vegetation manipulation to full-scale bank and channel modification. General practices follow standard stream restoration guidelines described in Chapter 2.

In this region there is a strong public commitment to protect and restore trout streams. Federal, state and local units of government have come together with other natural resource organizations and land trusts to raise funds, prioritize trout habitat improvement projects and coordinate implementation. There has been strong local community support within the City of River Falls, the University of Wisconsin River Falls and the local school district to promote education and protect the Kinnickinnic from storm water runoff. Such support led to the formation of the Kinnickinnic River Land Trust, a private non-profit organization dedicated to the protection, preservation and restoration of the cold water fish community and surrounding plant communities. The DNR Western Prairie Habitat Restoration Area and Kinnickinnic River Fishery Area share common goals of watershed protection and prairie restoration.

iv) Description of areas of special management interest in this region.

Primary Sites

These sites warrant high protection and/or restoration consideration during the development of the property master plan. See Appendix G of the “Rapid Ecological Assessment for Driftless Area Streams” (Appendix 2) for management considerations of the rare species and high-quality natural communities by Primary Site.

The Rush River Delta State Natural Area was identified in the Rapid Ecological Assessment as a Primary Site. To ensure that during the planning process the Department and public are able to evaluate all management options

for this high quality floodplain forest, the Department is deferring management actions at this 340 acre site until completion of the master plan.

State Natural Areas

The following State Natural Areas are part of this Master Plan:

Rush River Delta State Natural Area – Pierce County, 341 acres

Rush River Delta protects a floodplain forest on the alluvial plain at the mouth of the Rush River where it empties into the Mississippi River's Lake Pepin. The area supports stands of lowland hardwoods including silver maple, cottonwood, willow, American elm, and green ash. Large patches of wood nettle dominate the ground layer. Several open, wet depressions are vegetated with river bulrush and smartweed and provide excellent spawning habitat for northern pike and rearing areas for mallards and wood ducks. A sand spit extends into Lake Pepin at the Rush River mouth and provides nesting habitat for turtles and feeding and nesting areas for shorebirds. The surrounding woods support many rare breeding birds including red-shouldered hawk, Acadian flycatcher, and cerulean warbler, prothonotary warbler, and contain a small great blue heron rookery. Other woodland birds include yellow-throated vireo, warbling vireo, blue-gray gnatcatcher, American redstart, and northern oriole. Rush River Delta is owned by the DNR and was designated a State Natural Area in 1986.

Kinnickinnic Wet Prairie – St. Croix County, 43 acres.

Kinnickinnic Wet Prairie supports many native prairie plants that have persisted despite having been grazed in the past. Wet prairies were once common throughout this Ecological Landscape but none remain today. This site supports the most remnant species, and has the right soils and moisture content making it the best candidate for restoration. Active interseeding of grasses and other species will be needed in order to preserve this site and restore its species composition for future generations to enjoy. Numerous springs and seeps are also present. These provided a barrier to the cattle and may have served to protect the prairie. Sedge meadow and cattail marsh surround the prairie and contain less conservative species but are none-the-less high quality examples of these natural community types. Several seeps and springs flow into Parker Creek, a tributary of the Kinnickinnic River. Kinnickinnic Wet Prairie is owned by the DNR and was designated a State Natural Area in 2008.

c) Recreation facilities in this region.

See Appendix 3.

d) Other issues and challenges in this region.

Intensive agriculture and urban growth are the two primary issues that present the greatest challenge to this watershed. Both create high land values and limit the Department's ability to purchase significant tracts of land needed to protect sensitive resources. Urban growth creates impervious surface, reduces groundwater infiltration and, if unchecked, accelerated runoff. Such activity has the potential to impair trout streams in the western portion of the watershed. As grain prices rise, so do land values; in recent years this has led to the conversion of CRP, highly erodible fallow land, pine plantations, woodlots and other lands to cash crops. The potential for accelerated runoff, less infiltration and increased sedimentation from added crop land also can negatively impact base flow, damage habitat and cold water fish communities. Concentrations of factory farms in the headwaters of Parker Creek, the Rush River, and its tributaries raise the risk of nutrient enrichment, manure runoff and fish kills. As the farm economy reaps the benefits of high cash crop prices many farmers are investing in major infrastructure improvements, such as high capacity irrigation wells. This is most prevalent in the headwater regions of the Kinnickinnic River. The compatibility of all these actions and the management of cold water resources are not well understood at the local level and potentially present significant challenges to the protection and preservation of cold water fish communities.

3. Report card on Trout and Smallmouth Bass streams in the Kinnickinnic River Region

Figure 3.4: Overview report card of the Kinnickinnic River Region.

Grade methods are described in Chapter 2. Grades show each watershed's place in the distribution of all Driftless watersheds. An **A** means the value is in the upper quartile (75%-100%) or upper quintile (80%-100%) of the distribution, whereas an **F** means the value is zero or is in the lowest quintile (0-20%) of the distribution. Blank cells indicate "not applicable."

			Watersheds					
			Big River - Mississippi River	Hay Creek - Mississippi River	Kinnickinnic River	Lake Pepin	Rush River	Trimble River
Brook Trout	Stream Health and Habitat Quality	Natural Habitat Potential	B	B	A	B	B	B
		Land Use Stress	D	D	D	C	C	C
	Fishery Performance	Stock (5" up to 8")	F		B	A	B	F
		Quality (8" up to 12")	F		C	B	A	F
		Memorable (12" +)	F		F	F	F	F
Projected resilience to climate change		C		C	B	C	B	
Brown Trout	Stream Health and Habitat Quality	Natural Habitat Potential	B	D	D	B	B	B
		Land Use Stress	F	D	F	B	C	D
	Fishery Performance	Stock (6" up to 10")	A		A	D	A	A
		Quality (10" up to 15")	B		A	C	A	A
		Memorable (15" +)	D		C	F	A	C
Projected resilience to climate change		D		C	D	B	C	
Smallmouth Bass	Stream Health and Habitat Quality	Natural Habitat Potential			F	B	D	
		Land Use Stress			D	A	C	
	Fishery Performance	Stock (8" up to 14")			F		D	
		Memorable (14" +)			F		F	
Projected gain from climate change		D		B	D	C	C	
Trout Stream Habitat	Thermal resilience of trout streams		A	-	C	C	C	A
	Total miles of stream restoration		F	-	B	F	C	C
Recreation	Angling opportunities	Percent of trout stream miles with public access	F		A	C	D	D
		Percent of smallmouth bass stream miles with public access			A		C	
	Supply relative to demand	Miles of publicly-accessible trout and SMB streams per 100K people within a 1-hour drive	F	F	C	D	D	D

a) Brook Trout

i) Stream Health and Habitat Quality

Figure 3.5 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle), and probability of occurrence (bottom) for brook trout in the region.

Natural Habitat Potential

The Kinnickinnic region hosts a number of attributes (in particular precipitation and air temperatures) conducive for brook trout. Although base flows are somewhat limited in the southern part of the region, these are offset by the slopes in most sub-watersheds. As a result, the region generally has above average to exceptional natural habitat potential for brook trout.

Land Use Stress

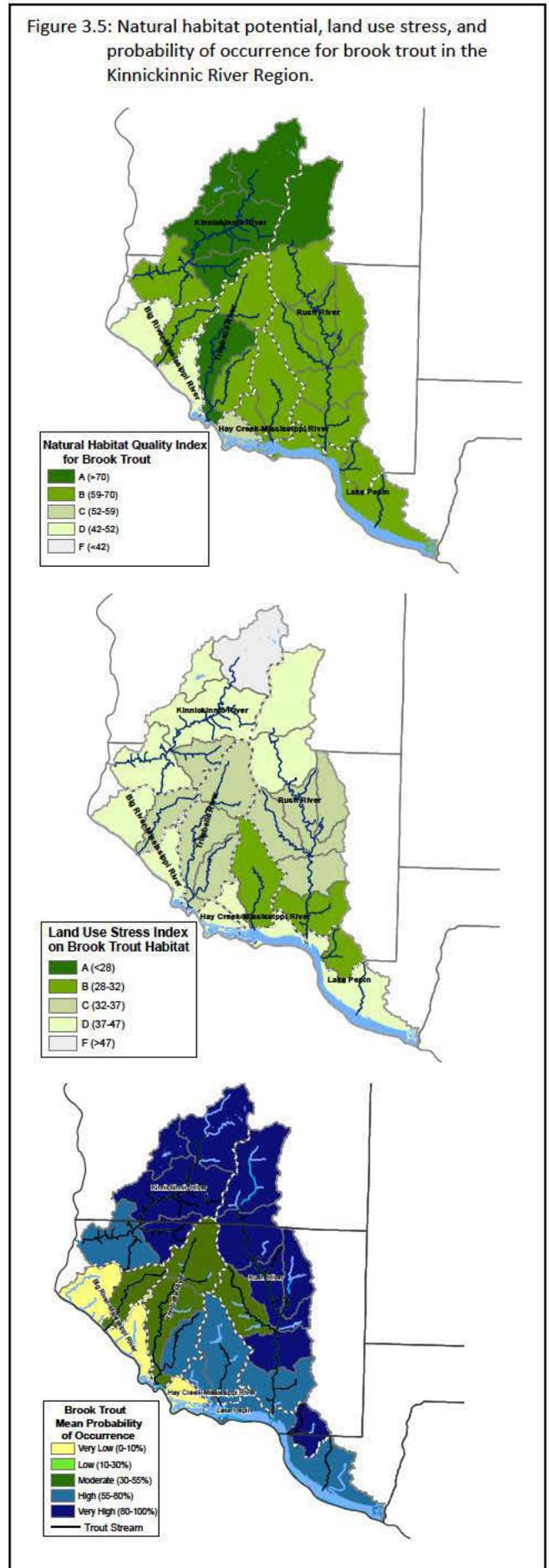
Land use stress is moderate to high for brook trout throughout the region, with the greatest stress found in the northern headwaters and western drainages. This is primarily due to the heavy influence of row cropping and large dairy operations and the lack of forest or permanent grasslands in the sub-watersheds. Center pivot irrigation is on the rise in intermittent areas of the Kinnickinnic River headwaters. Large-scale land application of liquid manure has been problematic in the headwaters of the Kinnickinnic River, Parker Creek and the Rush River. Urban growth and residential expansion from the Twin Cities (River Falls, Roberts, Hammond and Baldwin) adds impervious surfaces, which contribute to storm water issues in the north and western half of the region. Two hydropower dams located within the City of River Falls elevate water temperature in downstream portions of the Kinnickinnic River.

Pine Creek, Morgan Coulee, Isabelle and parts of the Rush River sub-watersheds are very heavily forested and therefore are impacted less by land use stress on brook trout populations, however flooding from headwater agricultural lands remain problematic.

Probability of Occurrence

Despite the moderate levels of land use stress (and the high levels in the northern section of the region), the region's high natural habitat quality lead to model outputs of a high to very

Figure 3.5: Natural habitat potential, land use stress, and probability of occurrence for brook trout in the Kinnickinnic River Region.



high expected probability of brook trout occurring in the future throughout much of the Kinnickinnic River Region. The discrepancy between where occurrence is projected but brook trout do not occur, specifically the Big River, Trimbelle River, and Isabelle Creek sub-watersheds, is likely explained by competition with brown trout (see the discussion on competition in Chapter 2).

Based on fish survey data, brook trout are most prevalent in the South Fork of the Kinnickinnic, where natural waterfalls prevent upstream migration of brown trout from the main stem, in isolated (by Lake Pepin) sub-watersheds such as Pine Creek and Bogus Creek where brown trout populations are reduced, or in the cold headwaters and small tributaries of larger brown trout streams (e.g., the Kinnickinnic, Rush River or Little Trimbelle Rivers).

ii) Sport Fishery Performance

Figure 3.6 shows the average relative abundance of stock, quality and memorable size brook and brown trout in each watershed measured using stream electrofishing catch per unit effort (fish per mile). The Kinnickinnic River Region contains a concentration of some of the best brook trout populations in the state. Brook trout are most prevalent in the tributaries or headwater streams of the Kinnickinnic, Lake Pepin and Rush River watersheds

While the graph depicts a median for each watershed, individual streams - such as Pine Creek, Bogus Creek and the South Fork of the Kinnickinnic - have abundant brook trout populations (Figure 3.7). Some streams or sub-watersheds have significant populations of both stock and quality sized brook trout, such as portions of the Rush River mainstem and its tributaries, Cave and Lost Creek, the headwaters of the Kinnickinnic River and Parker Creek, and the Little Trimbelle River. The South Fork, Pine Creek and parts of the Rush River are known to produce significant numbers of quality-sized brook trout. The best candidates in the region for memorable-size brook trout include the South Fork, Pine Creek and Cave Creek.

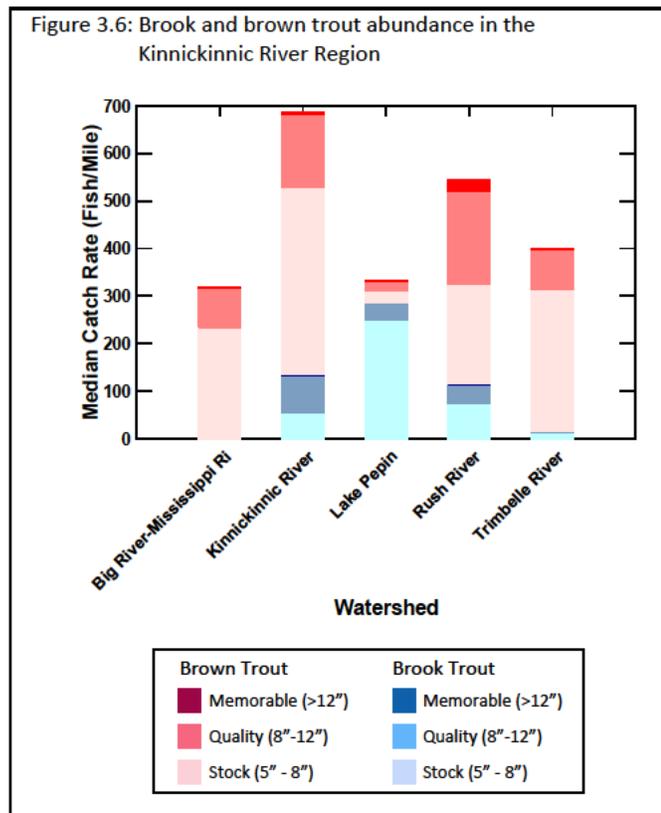
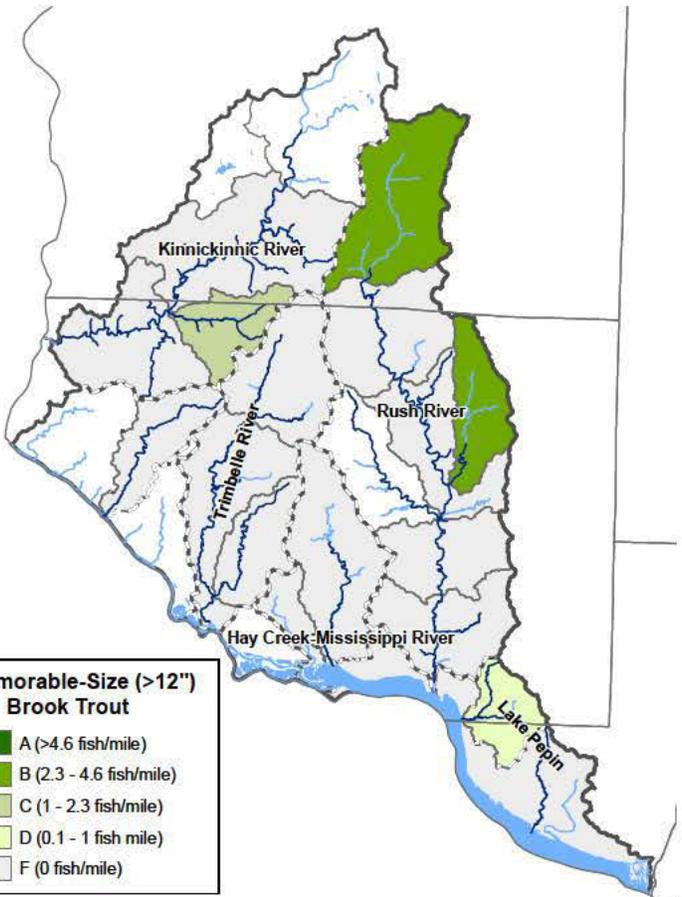
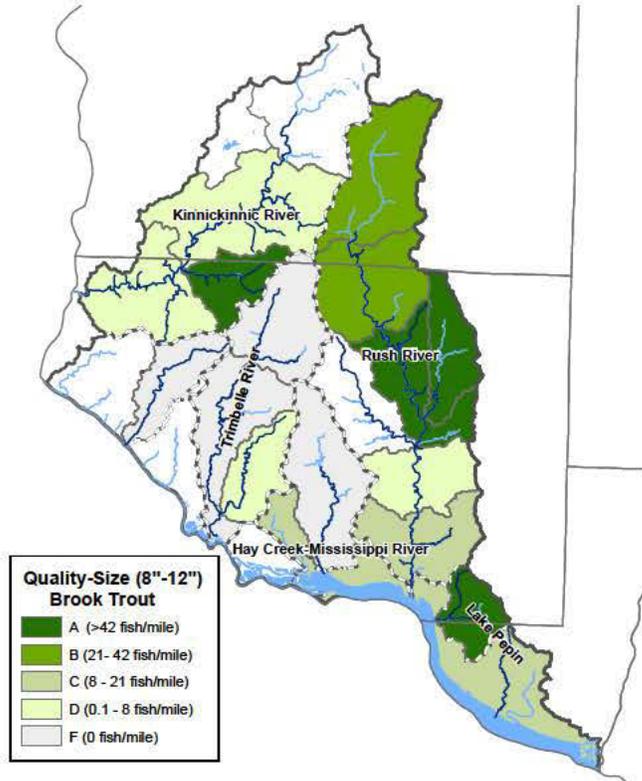
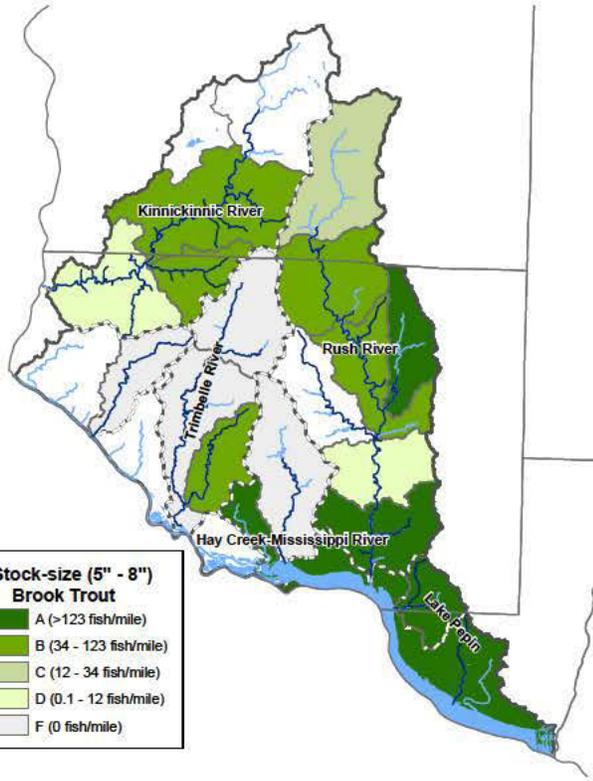


Figure 3.7 on the following page depicts the distribution of different sized brook trout. These maps use the same data as shown in the above bar chart.

Figure 3.7: Brook trout density in the Kinnickinnic River Region – stock, quality, and memorable fish.



iii) Projected Resilience of Brook Trout to Climate Change

Fish distribution models incorporating climate change impacts project serious declines for brook trout in the Kinnickinnic Region watersheds, most notably the Rush River system where over 80% of the occupied stream miles are projected to be lost (Figure 3.8). Projections of the amount of brook trout stream miles that are at risk or projected to be lost are exaggerated in the Trimbelle and Lake Pepin watersheds. This has occurred because the model projects that brook trout are currently present in about 25 and 18 miles of these watersheds' streams, respectively. In reality, brook trout are not present in much of the main stem of the Trimbelle River and Isabelle Creek and only occur in a limited number of miles in each watershed.

Although the model projects very few miles of brook trout streams in the region will remain by the mid-century, there are projected to be a notable amount of stream miles in the Trimbelle and Lake Pepin watersheds where several sub-watersheds receive "A" grades (Figure 3.9). Again, this projection is likely exaggerated since they currently occur in only limited portions of these watersheds.

Figure 3.8: Projected climate effects on future brook trout distribution in the Kinnickinnic River Region (2046 to 2065).

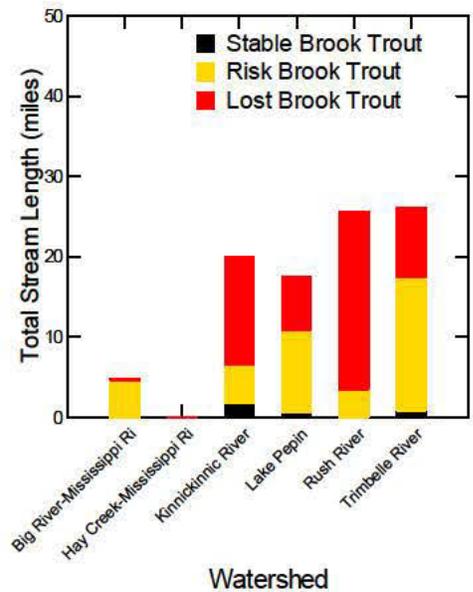
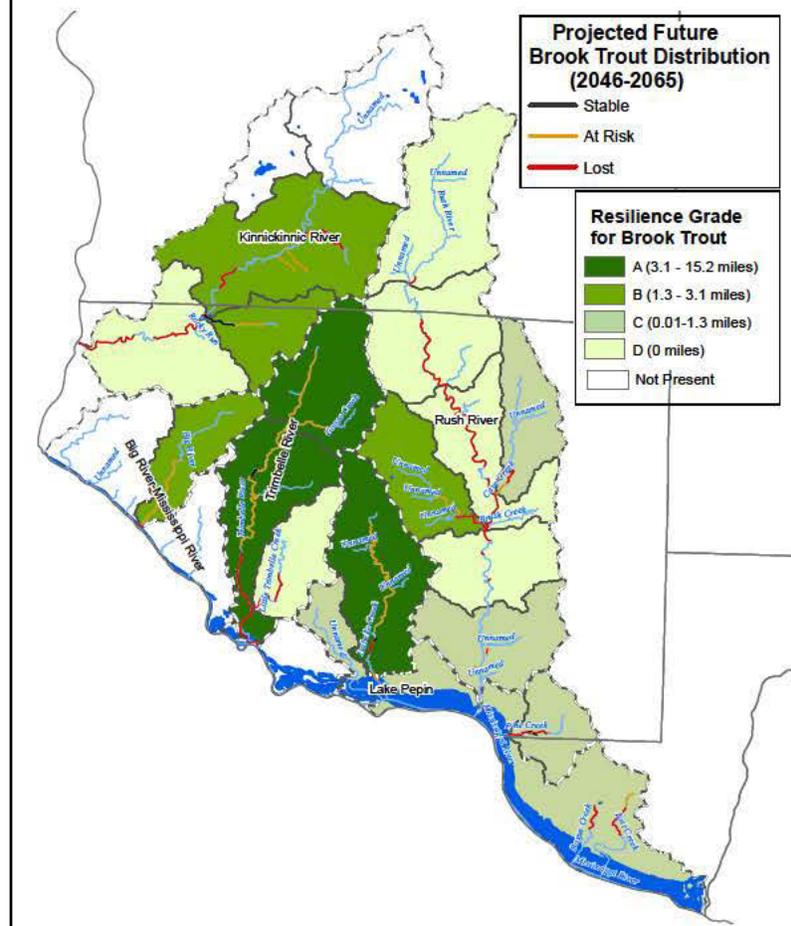


Figure 3.9: Projected future brook trout distribution and resilience in the Kinnickinnic River Region.



b) Brown Trout

i) Stream Health and Habitat Quality

Figure 3.10 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle), and probability of occurrence (bottom) for brown trout in the region.

Natural Habitat Potential

The natural habitat potential for brown trout in the Kinnickinnic River is modeled to be average to slightly sub-par compared to the rest of the Driftless Area. In addition to air and precipitation aspects, the region is notable for the amount of carbonate bedrock.

Land Use Stress

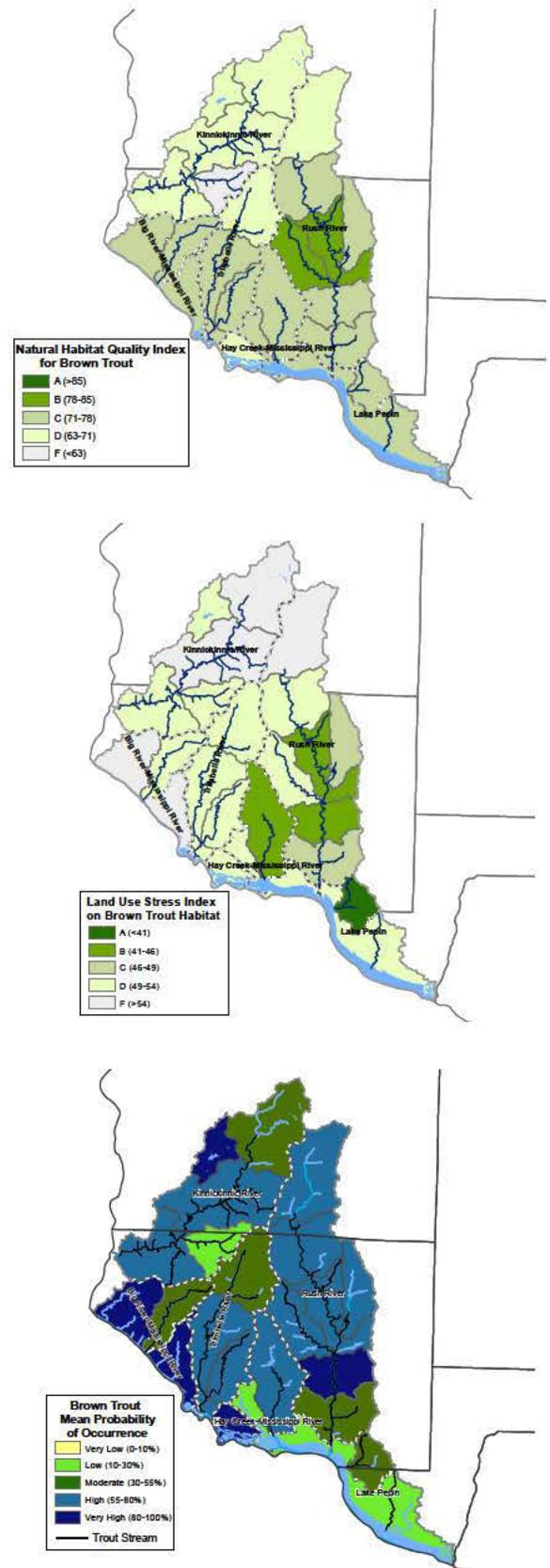
Land use stress is moderate to high for brown trout throughout the region with the greatest stress found in the northern headwaters and western drainages. As with brook trout, these scores are expected due to the influence of row cropping and the lack of forest or grasslands in the sub-watersheds. Other factors effecting land use stress on brown trout are similar to those on brook trout. Pine Creek as well as the Isabelle and parts of the Rush River sub-watersheds are very heavily forested and therefore brown trout populations are less impacted by land use stress. However flooding from headwater agricultural lands remain problematic in these areas.

Probability of Occurrence

Generally speaking, the model suggests that brown trout have a moderate to high probability of occurrence throughout the region. Somewhat surprisingly, the model calculates a very high probability of occurrence in a couple of small streams draining into the Mississippi River that are not classified trout waters.

As will be seen later in this chapter, fish survey results indicate several streams in the Kinnickinnic Region contain some of the largest populations and highest densities of brown trout in the Driftless Area.

Figure 3.10: Natural habitat potential, land use stress, and probability of occurrence for brown trout in the Kinnickinnic River Region.

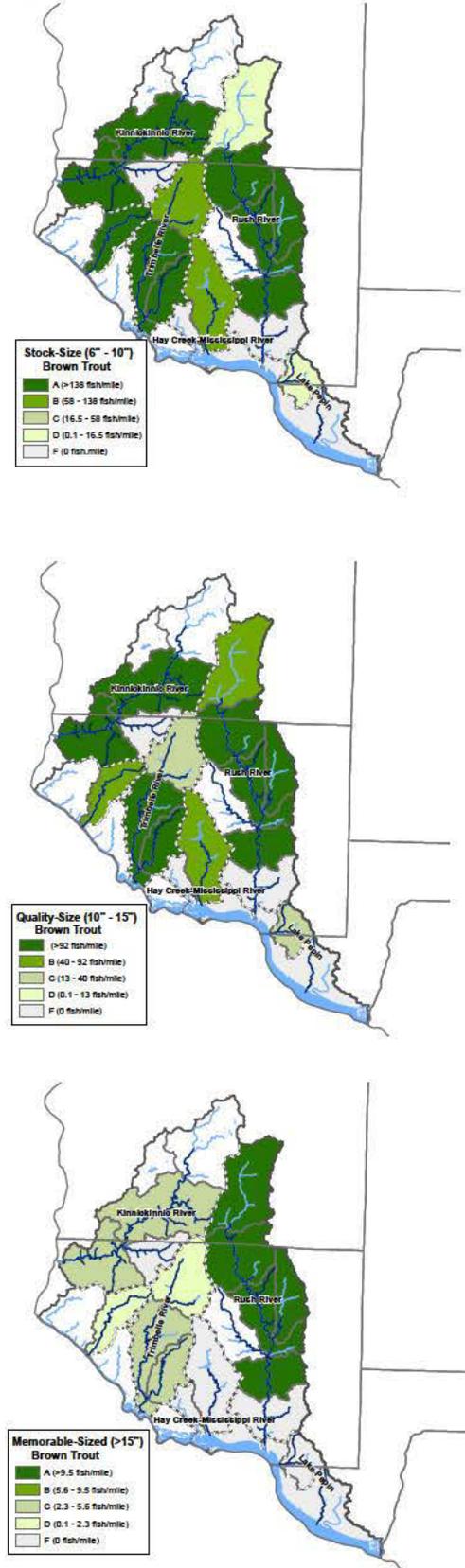


ii) Sport Fishery Performance

As can be seen in Figure 3.11, the Kinnickinnic River Region contains a concentration of sub-watersheds with very high brown trout densities. Indeed, at nearly 550 fish/mile, the Kinnickinnic River watershed has the highest median catch rate for brown trout in the Driftless Area. The Rush and Trimbelle rivers also have exceptional quality and the Rush River has long been known for large, memorable-sized brown trout. Isabelle Creek has moderate densities of stock-sized fish.

Some streams or sub-watersheds have significant populations of both stock and quality sized brown trout. Examples include portions of the Rush River mainstem and its tributaries, Cave and Lost Creek, the headwaters of the Kinnickinnic River and Parker Creek, and the Little Trimbelle River. Low densities of brown trout are found in the cold waters of Pine Creek and the headwaters of the Rush River, where stream temperatures become marginal for trout.

Figure 3.11: Brown trout density in the Kinnickinnic River Region – stock, quality, and memorable fish.



iii) *Projected Resilience of Brown Trout to Climate Change*

Overall, a modest portion of the Kinnickinnic River and Rush River brown trout populations are projected to be at risk or lost due to warming climate (Figures 3.12 and 3.13). The Lake Pepin (Isabelle Creek) and Trimbelle River watersheds are projected to have virtually no loss in brown trout distribution, while the Big River is projected to lose only a small fraction of its limited distribution. The Trimbelle and Isabelle rivers are currently dependent on stocking to support brown trout fisheries.

The model projects a range in the number of miles of brown trout stream miles that will occur by the mid-century. Some sub-watersheds are projected to retain much of their existing distribution of brown trout (e.g., the upper Kinnickinnic, lower Trimbelle, and middle Rush rivers) while other sub-watersheds will not fare as well.

The upper Kinnickinnic has strong groundwater input and an outstanding thermal regime. During the past 20 years, the Rush River has shown major improvements in water temperature and trout reproduction. This Class II trout stream hasn't been stocked for 5 years and is planned for reclassification to Class I.

Prior to the 1960s, the lower Kinnickinnic River was considered a warm water stream; it also has thermal impacts from dams.

Figure 3.12: Projected climate effects on future brown trout distribution in the Kinnickinnic River Region (2046 to 2065).

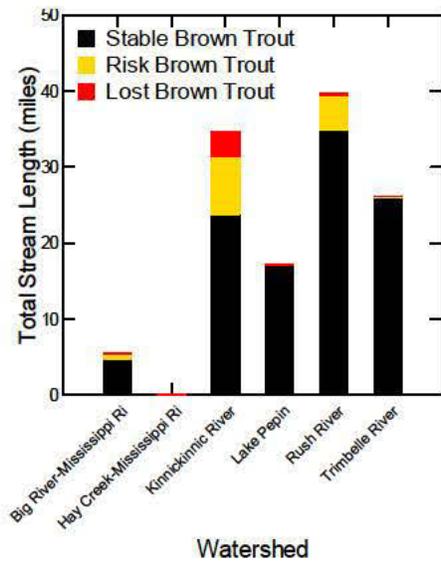
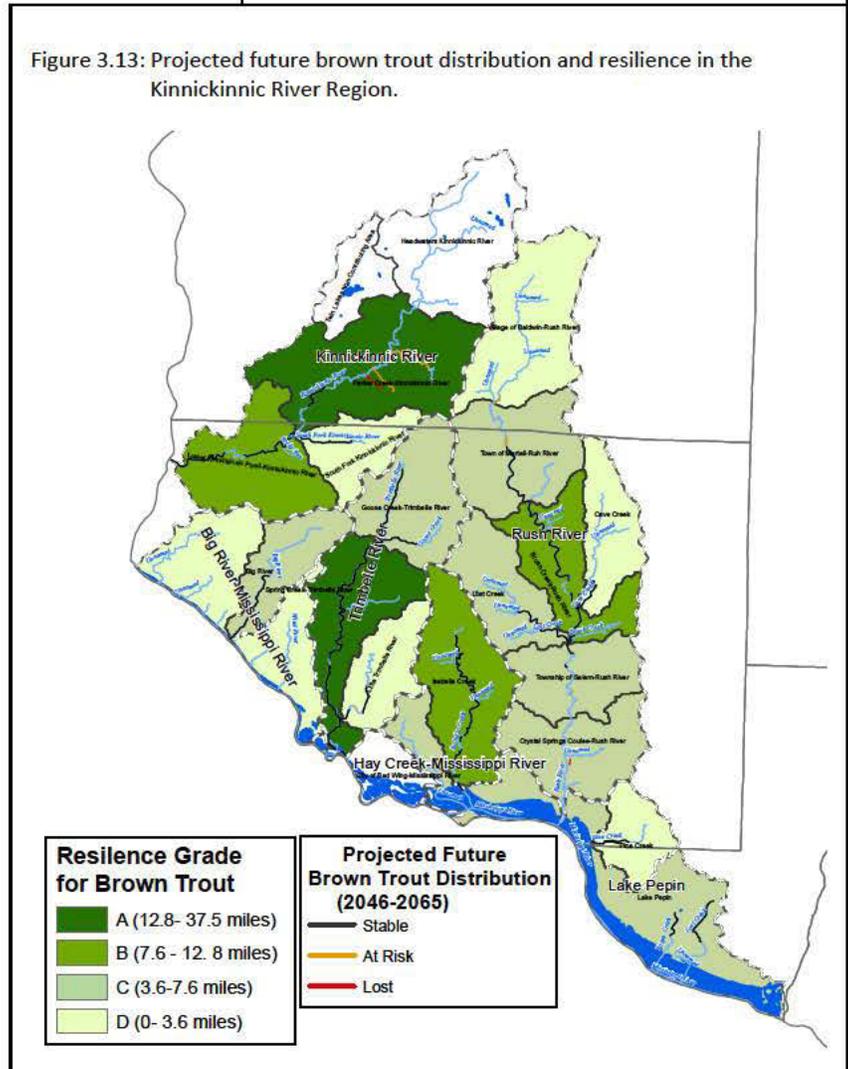


Figure 3.13: Projected future brown trout distribution and resilience in the Kinnickinnic River Region.



c) Smallmouth Bass

i) Stream Health and Habitat Quality

Figure 3.14 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle), and probability of occurrence (bottom) for smallmouth bass in the region.

Natural Habitat Potential

While stream health and habitat quality models show some potential for smallmouth bass in the Kinnickinnic River watershed, overall, the habitat for the species is limited by stream size and water temperature.

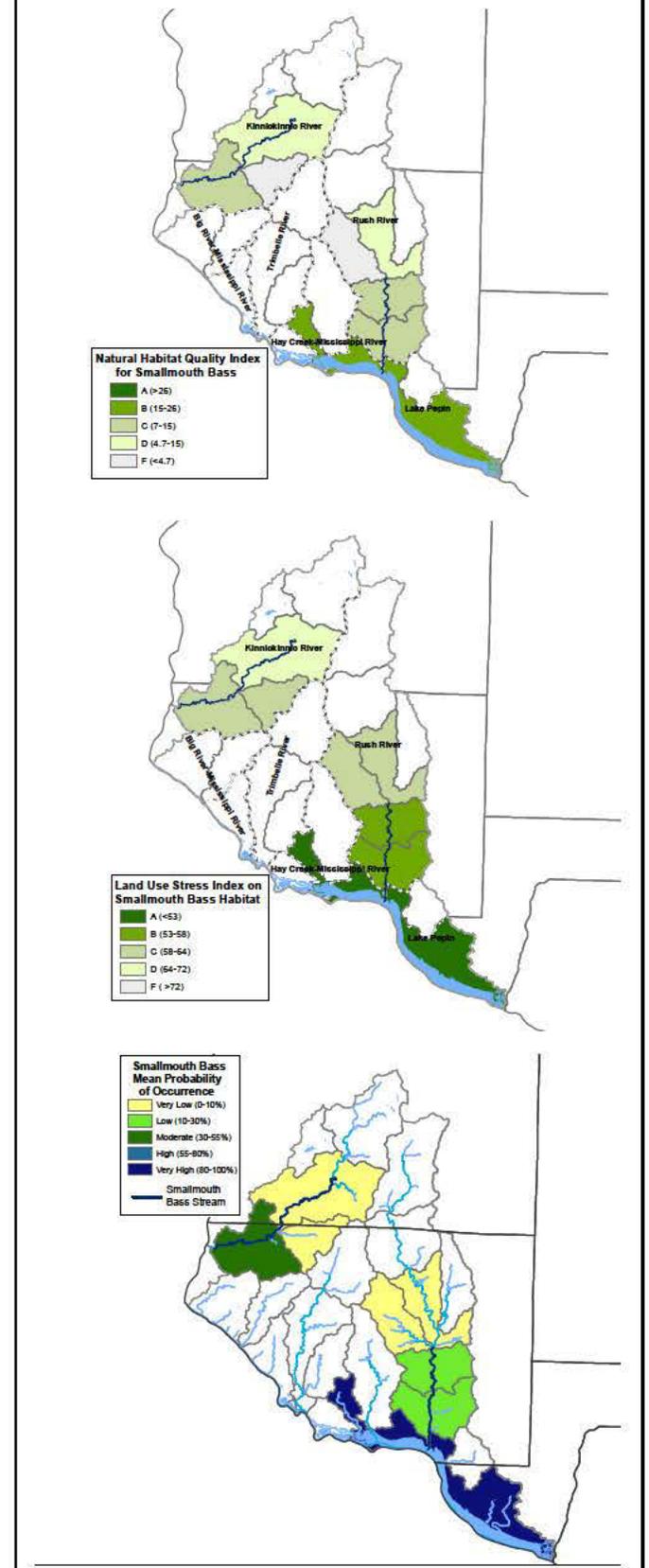
Land Use Stress

Generally, land use stress is moderate to low with the least impacts in the Lake Pepin sub-watershed along the Mississippi River.

Probability of Occurrence

The model suggests a very high probability of occurrence in the Lake Pepin sub-watershed, which includes the very lowest reach of the Rush River. The low and moderate probabilities of occurrence upstream in the Rush River and in the lower part of the Kinnickinnic River are confirmed by fish sampling data that show a small population of smallmouth bass in combination with brown trout. A few smallmouth bass currently are found a short distance upstream from the warm water influence of the Mississippi or St. Croix River. The Big and Trimbelle rivers, as well as the streams of the Lake Pepin sub-watershed may simply be too small to support any number of smallmouth bass.

Figure 3.14: Natural habitat potential, land use stress, and probability of occurrence for smallmouth bass in the Kinnickinnic River Region.



ii) Sport Fishery Performance

Figures 3.15 and 3.16 show smallmouth bass abundance to be extremely limited and confined to the Rush River watershed. However personal observations by local fisheries staff confirm the presence of a limited population in the Lower Kinnickinnic River. In both rivers an adult smallmouth bass population can be found in pools a short distance upstream from the confluence with the larger, warm water St. Croix and Mississippi Rivers. The potential for smallmouth bass to occupy the upstream portions of the Kinnickinnic and Rush Rivers is limited by hydro dams and/or current cold water temperature regimes.

The Big and Trimble rivers, as well as the streams of the Lake Pepin sub-watershed, may simply be too small to support smallmouth bass.

Figure 3.15: Smallmouth bass abundance in the Kinnickinnic River Region.

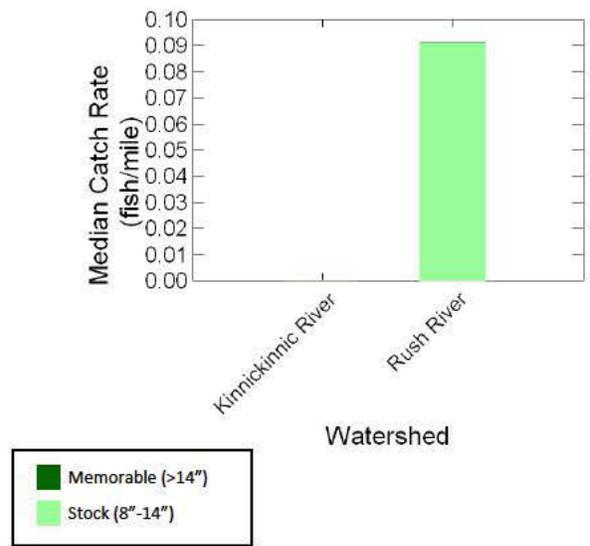
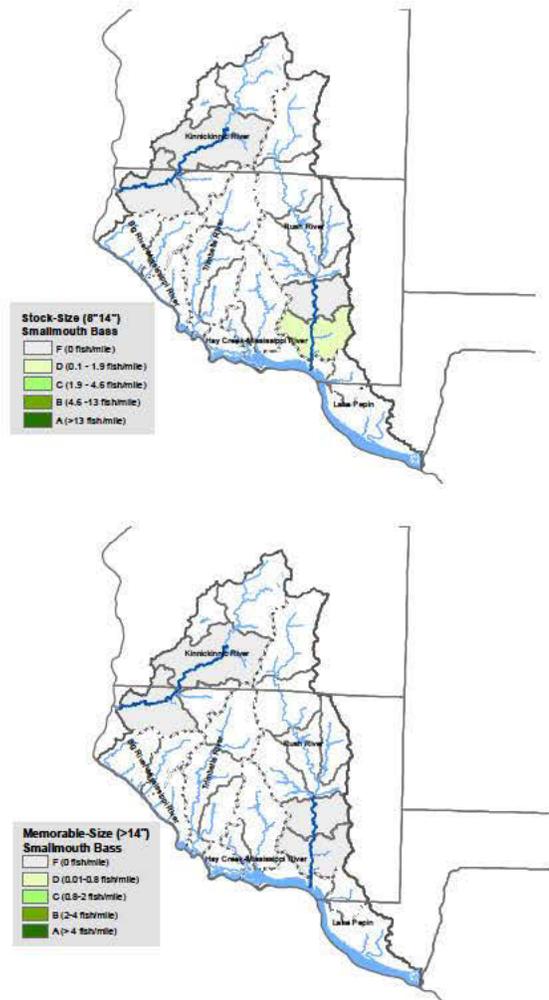


Figure 3.16: Smallmouth bass density in the Kinnickinnic River Region – stock and memorable fish.



iii) *Projected Gains of Smallmouth Bass to Climate Change*

As stream temperatures rise, the potential for smallmouth bass to expand upstream into current brown trout water is very possible in the region (Figures 3.17 and 3.18). The fish distribution model projects gains in the Kinnickinnic River watershed in particular. Big River is a small stream and upstream expansion of smallmouth bass is unlikely. Although smallmouth bass have been recorded from only a limited number of stream miles in the region, the potential for significant sections of these systems to shift toward warm water smallmouth bass fisheries is probable. It remains questionable whether the Trimbelle is large enough to support any kind of smallmouth bass fishery.

Figure 3.17: Projected climate effects on future smallmouth bass distribution in the Kinnickinnic River Region (2046 to 2065).

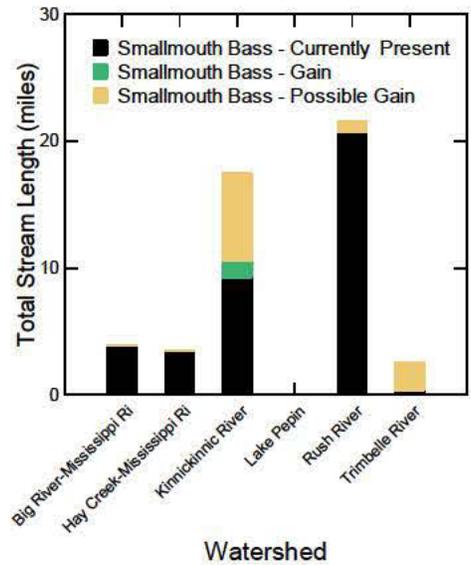
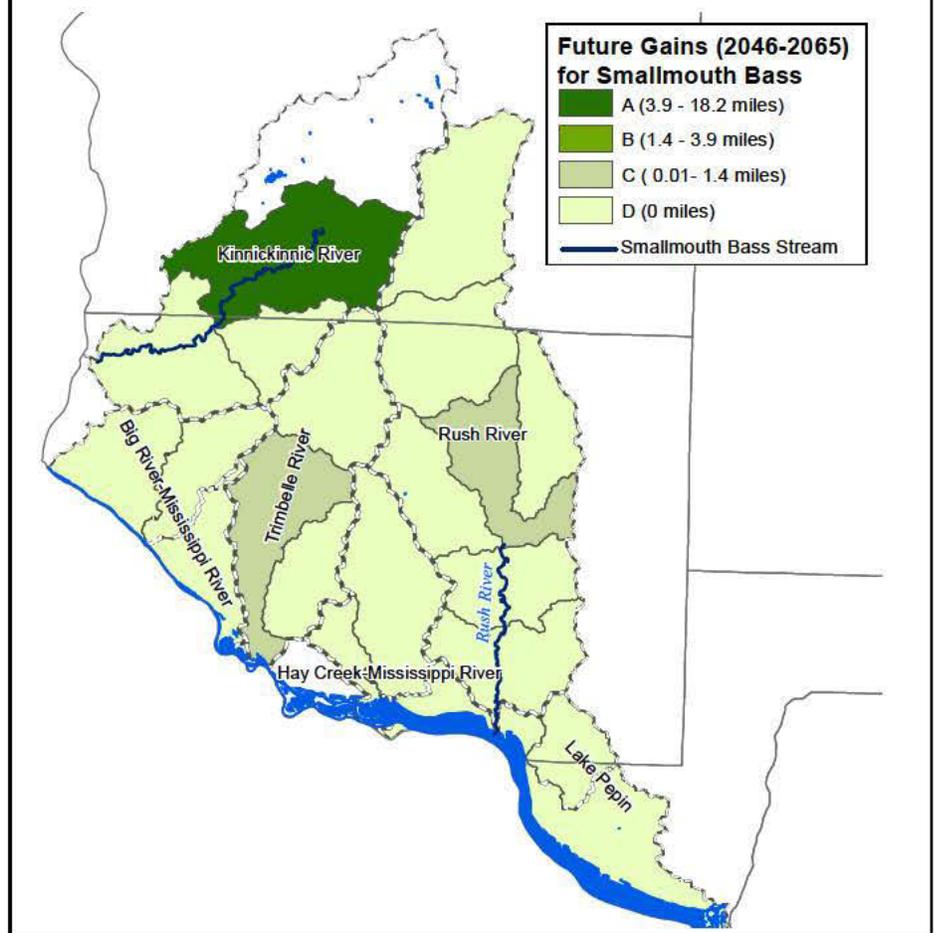


Figure 3.18: Projected future smallmouth bass distribution and gain in the Kinnickinnic River Region.



d) Trout stream thermal habitat

Figure 3.19 shows both the current and the projected thermal classification of trout streams in the Kinnickinnic River Region. Currently, almost all the streams in the region are classified as Cold or Cold Transition and support a wide range of brook and brown trout populations. The Kinnickinnic River upstream of River Falls and some of its tributaries such as Parker and Nye Creek have heavy groundwater influence. Small hydropower reservoirs within the City of River Falls slightly elevate downstream temperature but not to the detriment of the cold water fishery where populations of brown trout remain exceptional.

The Big River is almost entirely a cold water system while the Trimbelle, Isabelle and Rush rivers are more transitional in nature. When it comes to small streams in sub-watersheds within the larger Kinnickinnic River Region there are many that contain excellent thermal regimes – examples include: the South Fork of the Kinnickinnic, Rocky Branch, Little Trimbelle, and Lost, Cave, Pine and Bogus creeks.

The majority of stream and river miles in this region are projected to remain as either Cold or Cold Transition waters. The Trimbelle and Isabelle rivers are projected to be very resilient to climate change, while the Rush River and upper stretches of the Kinnickinnic River are projected to be less so.

As with other parts of the Driftless Area, many streams and creeks in the Kinnickinnic River Region have been restored and land uses have improved over the past 20 years. As a result, thermal regimes have considerably improved. For example, the Rush River system has seen a rise in trout density and natural reproduction.

Figure 3.19: Projected future* and current thermal classes of trout streams in the Kinnickinnic River Region.

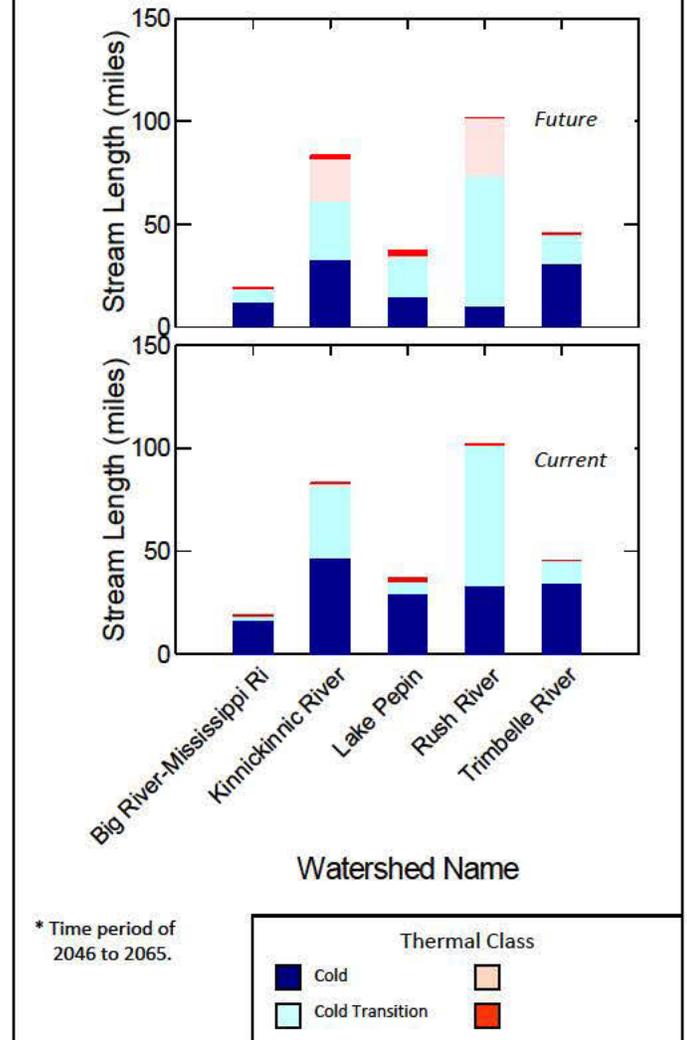
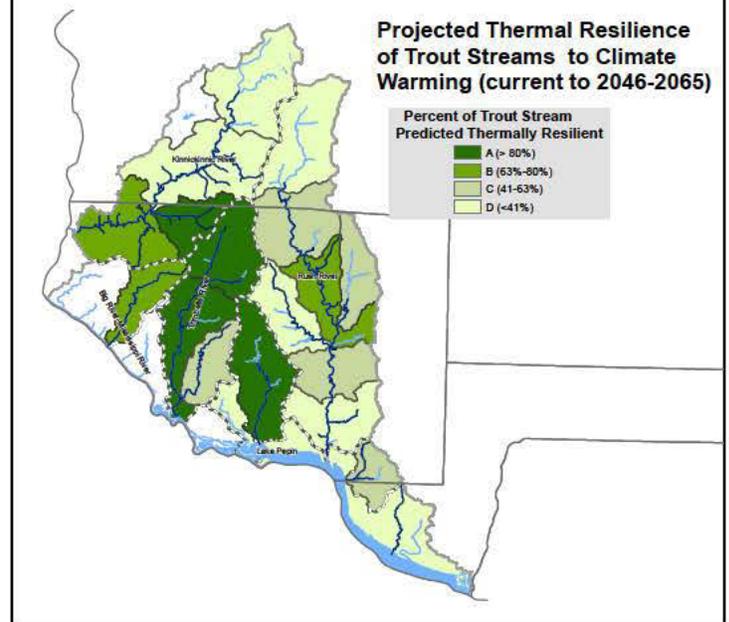


Figure 3.20: Projected changes in trout stream temperatures from current to the time period 2046-2065.



e) Trout stream restoration

Stream corridor restoration has the potential to off-set some of the negative effects of climate change on fish populations. Figures 3.21 and 3.22 show a significant amount of stream restoration in the Kinnickinnic River Region. In addition to the restoration work reflected in these figures, extensive restoration occurred in the upper Kinnickinnic prior to 1970. The three major watersheds that have had significant habitat work all have corresponding high densities of stock-sized brown trout (Fig 3.11). This habitat improvement is likely responsible for the improvement in natural reproduction in the Rush and Kinnickinnic rivers.

Most of the upper Kinnickinnic was heavily grazed in the 1940-50s. DNR crews built fence and cattle crossings to provide streambank buffers, installed in-stream habitat and planted trees to reduce erosion (1940-1970s). Brush control by volunteers, along with addressing high priority bank erosion sites, are the most recent actions. The erosion work was funded through the Kinnickinnic River Priority Watershed Project or other similar funding sources in cooperation with St. Croix County Land and Water Conservation Department.

Stream restoration work on the Rush River watershed has included a variety of projects that either repaired stream segments impaired by old mill dams or where serious bank erosion and down cutting has destabilized large stretches of river.

While most of the Rush River is currently in good shape, looking to the future, there are wide, shallow or eroded trouble spots throughout. The headwaters are very wide and sluggish, while the lower end is extremely large, heavily eroded, plagued by fine sediments and subject to major flooding. Therefore, the lower end is not a good candidate for standard in-stream habitat improvement projects.

Major efforts are underway to repair bank erosion and reduce fine sediment bed load in the Trimbelle. Additional work would be beneficial throughout much of the stream. Although not reflected in the map, most of the Pine Creek sub-watershed has been improved recently. No restoration work has been completed in the Isabelle watershed, although the river would greatly benefit from in-stream work. Similarly, no work has been completed in the Big River; heavy flooding in this high gradient river does not lend itself to standard in-stream habitat work.

Figure 3.21: Miles of trout habitat work completed from 1970 to 2006 in the Kinnickinnic River Region.

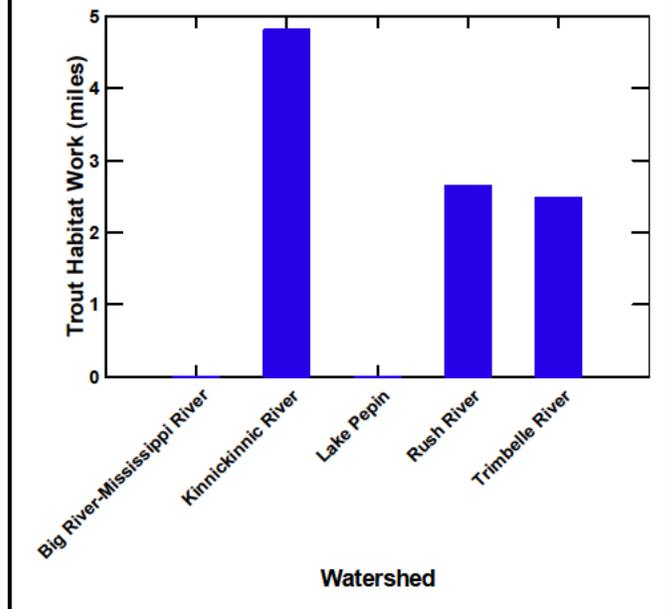
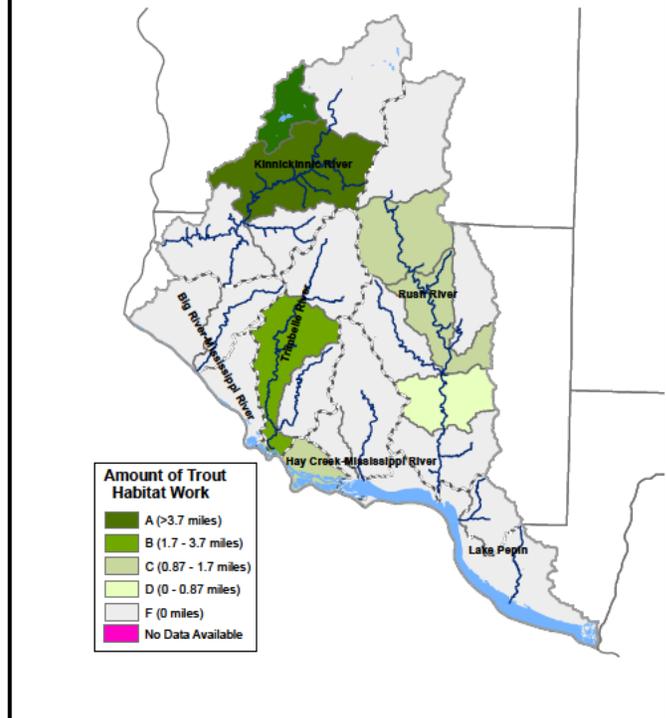


Figure 3.22: Relative amount of trout habitat work completed from 1970 to 2006 in the Kinnickinnic River Region.



f) Recreation Opportunities

i) Trout angling opportunities

Although there are many road crossings from which to access streams in the region, other public access opportunities (fishing easements and public land) range from excellent to nonexistent (Figures 3.23 and 3.24). The Kinnickinnic River and its tributaries have excellent public access through a combination of Kinnickinnic River State Park, Kinnickinnic River Fishery Area or Stream Bank Protection lands, City or River Falls parklands and Kinnickinnic River Land Trust fee title or easement lands.

Most of the fishable waters of Pine Creek (Lake Pepin watershed) are currently owned by the DNR and managed as a Fishery Area.

The Rush River drainage has a number of state owned stream bank easements, along with several large tracts of federal mitigation land open to fishing. In addition, three non-profit organizations, Eau Galle Rush River Sports Club, the Ellsworth Rod and Gun Club and West Wisconsin Land Trust own substantial parcels of land open to public fishing.

The Trimbelle River has a limited number of parcels open to public access, including Trimbelle Township parklands, DOT mitigation lands and several DNR stream bank easements.

No public accessible lands are available on Big River or Isabelle Creek drainages.

Figure 3.23: Percent of trout stream miles in the Kinnickinnic River Region that are in public ownership.

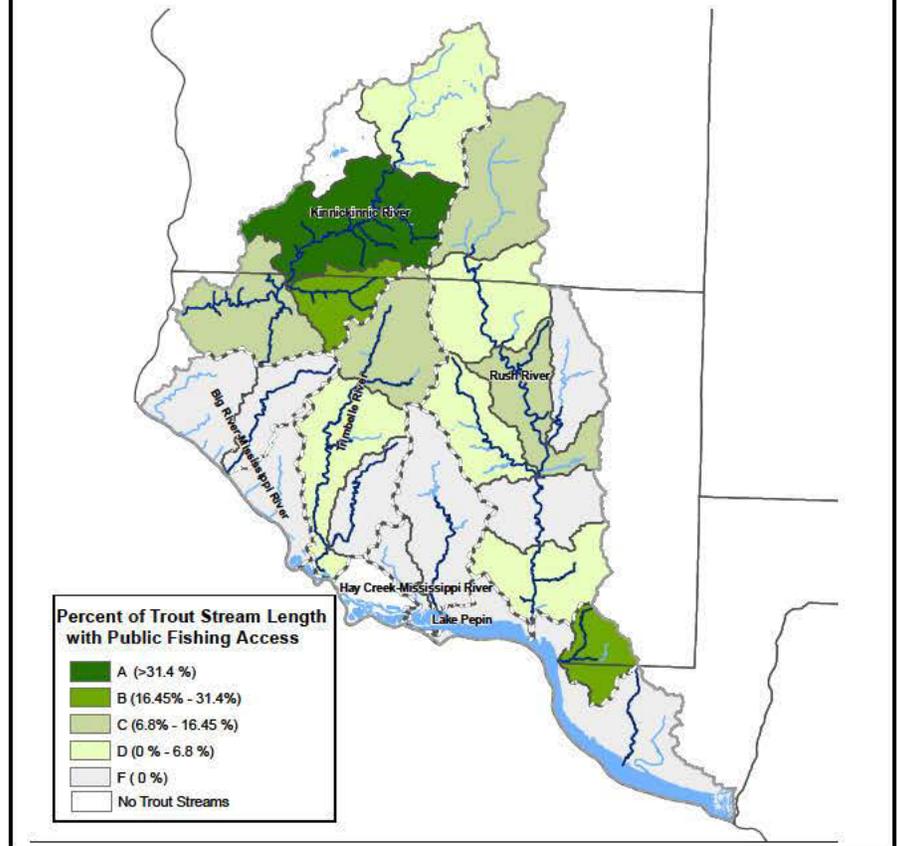
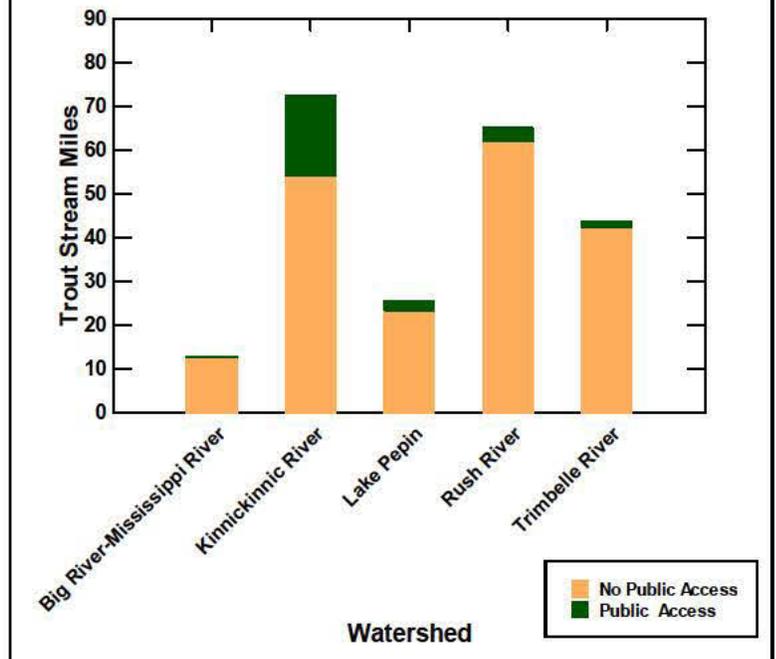


Figure 3.24: Miles of trout streams in the Kinnickinnic River Region with and without public access.



ii) Smallmouth Bass angling opportunities

While smallmouth bass opportunities are plentiful on the Mississippi and St. Croix River boundary waters, inland opportunities in the Kinnickinnic Region are generally lacking due to the adverse influence of cold water on smallmouth bass throughout the region. Where smallmouth bass are located, public access is plentiful (Figures 3.25 and 3.26).

The Lower Kinnickinnic River passes through Kinnickinnic River State Park, with public parking on CTH F. The Kinnickinnic River Land Trust has purchased many stream bank easements open to public fishing.

The Lower Rush River also has public parking at STH 35 near the confluence and both State and Federal land provide excellent access.

iii) Other recreation opportunities

Boating is very popular on the Minnesota/Wisconsin boundary waters. A few small reservoirs are found in Pierce County and small natural lakes are common in northern St. Croix County. Tubing, canoeing and kayaking are common on the lower Kinnickinnic River. Two state parks (Willow River and Kinnickinnic River), Nugget Lake County Park and the Corp of Engineers Eau Galle Recreation Area are found within or a short distance from the region. These parks provide camping, hiking, canoeing, boating and shore fishing opportunities in the area. The DNR owned Pierce County Islands Wildlife Area, several other scattered wildlife habitat areas and the Western Prairie Habitat Restoration Area also provide many hunting opportunities. The City of River Falls has several parks that provide a variety of outdoor recreational opportunities such as hiking, kayaking and fishing.

Figure 3.25: Percent of smallmouth bass stream miles in the Kinnickinnic River Region that are in public ownership.

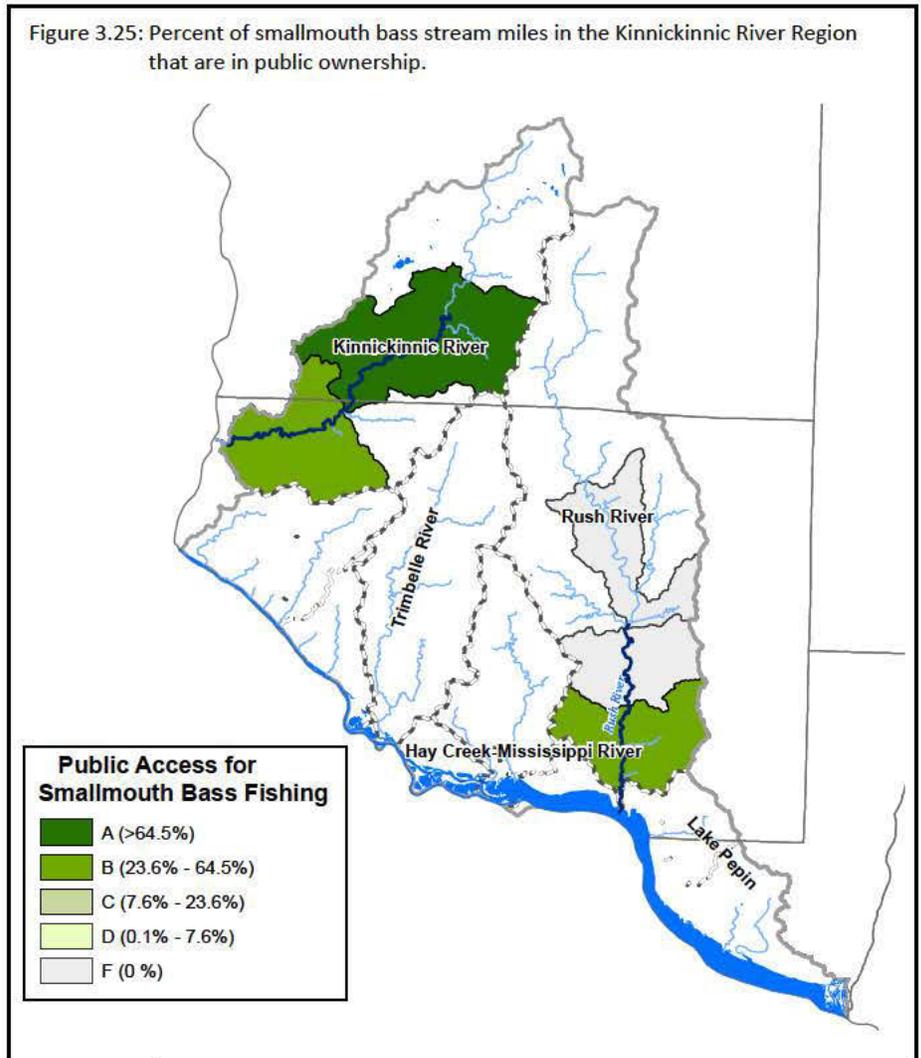
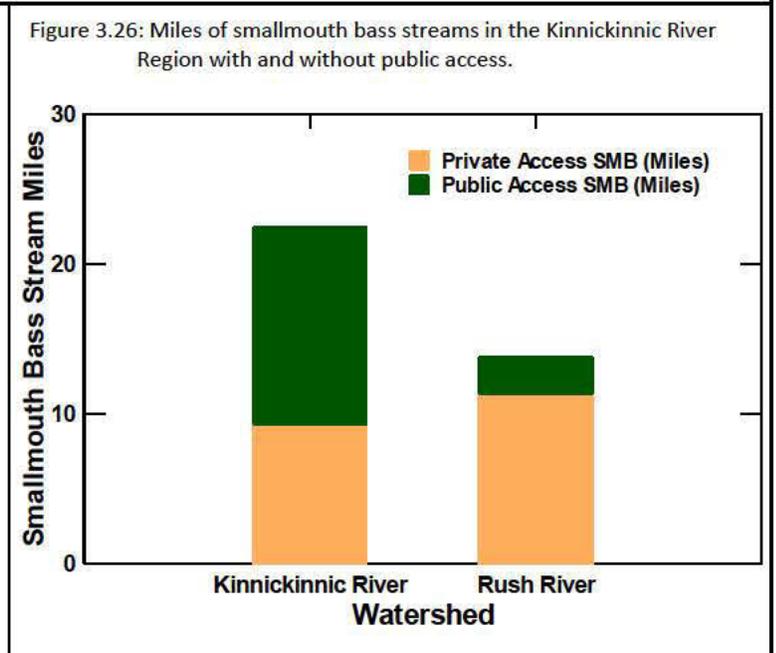


Figure 3.26: Miles of smallmouth bass streams in the Kinnickinnic River Region with and without public access.



iv) Recreation demand and supply

Figure 3.27 shows that nearly the entire Kinnickinnic River Region lies within easy driving distance of over 700,000 people. The Kinnickinnic River is located within a short drive (20 to 60 minutes) of the Twin Cities metropolitan area. Although there are a few small trout streams in Minnesota between the Twin Cities and the Kinnickinnic River Region, they receive only a small amount of fishing pressure compared to the angling interest in the Kinnickinnic, Rush, Trimbelles and other streams in the region.

Other significant population centers within 20 miles of the Kinnickinnic River system include Stillwater, Hudson and New Richmond. The Kinnickinnic River passes through the City of River Falls and the University of Wisconsin-River Falls campus. Red Wing, MN is located near the mouth of the Trimbelles River. Small towns are scattered throughout the region including Roberts, Hammond and Baldwin to the north, Prescott to the west, Ellsworth and Bay City to the south and Maiden Rock, Stockholm and Pepin to the southeast. It is not uncommon for anglers living in Menomonie and Eau Claire to travel 20 to 50 miles to fish in the region. Because of their popularity, it is not uncommon for visitors to the Twin Cities to make a side-trip to fish the Rush and Kinnickinnic Rivers.

There are many miles of fishing opportunities along the Kinnickinnic River and a more modest amount elsewhere in the region (Figure 3.28). Because the area is in close proximity to the very large population in the Twin Cities metropolitan area, the region scores poorly in the amount of publicly-accessible angling opportunities relative to the fishing pressure (Figure 3.29). The Kinnickinnic River and Lake Pepin watersheds have the most opportunities and they provide less than 0.15 miles of public access per 100,000 people (within a one hour drive). Most of the public access is provided by the Kinnickinnic River Fishery Area and the recently developed Pine Creek Fishery Area.

Both the Rush and Trimbelles watersheds lack any significant public access. Most anglers must get landowner permission or enter the streams from public roadways.

Figure 3.27: Population within a one-hour drive of sub-watersheds in the Kinnickinnic River Region.

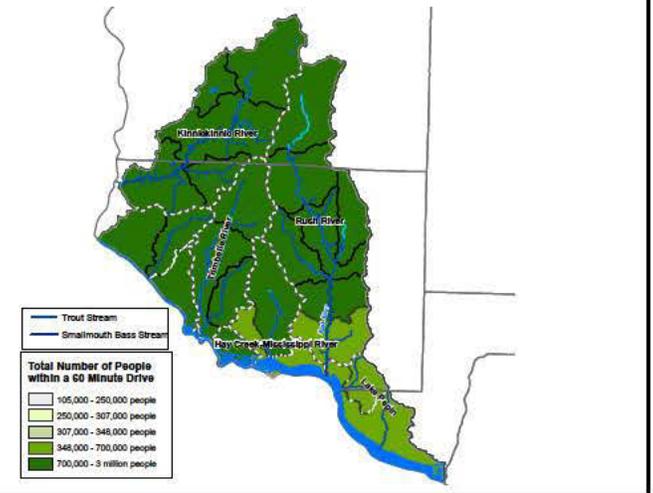


Figure 3.28: Publicly-accessible miles of trout and smallmouth bass streams per 100,000 people within a one-hour drive of watersheds in the Lower Wisconsin River Region.

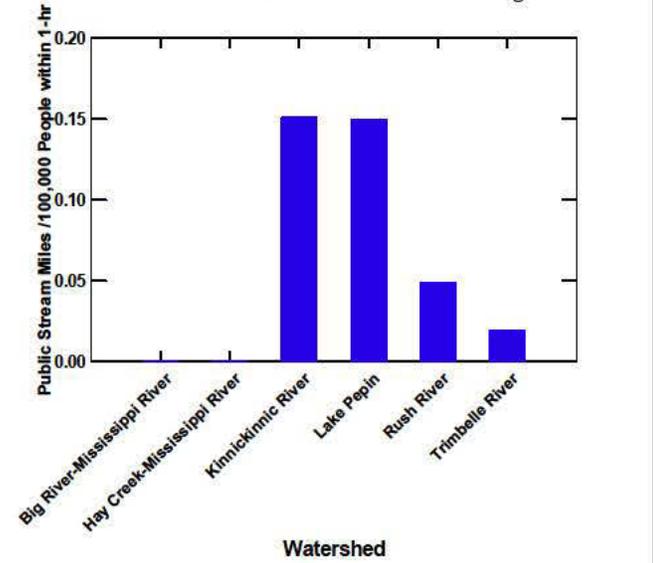


Figure 3.29: Supply of publicly-accessible trout and smallmouth bass stream miles per 100,000 people within a one-hour drive of watersheds in the Lower Wisconsin River Region.



4. The Watersheds

Big River – Mississippi River

Most of this watershed is comprised of intermittent streams. Only the Big River and Wind River drainages contain permanent flow. The Big River is the only trout stream in the watershed. It is a small, high gradient Class I (5.5 mi.) and II (2.6 mi.) brown trout stream which originates in agricultural crop land but flows through a large, heavily wooded coulee before entering the Mississippi River. The majority of the stream is self-sustaining with moderate brown trout densities. Habitat in this high gradient stream is subject to change due to heavy flooding and beaver activity. Quality size trout are limited by the availability of pool habitat, however a few larger trout over 15 inches can be found in the system. Access to Big River is limited by road crossings, lack of public land and a narrow brushy corridor. Fishing activity therefore is considered light on this stream. There have been no targeted habitat restoration efforts on the Big River.

Kinnickinnic River

The watershed is primarily comprised of seven named and thirteen unnamed classified trout streams. The headwaters of the Kinnickinnic consist of a very large complex of intermittent streams. The named streams include the Kinnickinnic River, South Fork of the Kinnickinnic River, Parker Creek, Rocky Branch, Kelly Spring, Nye Creek and Ted Creek, all of which are Class I or II trout streams. Fishing opportunities consist of self-sustaining high density brown trout populations throughout the Kinnickinnic River, Rocky Branch and Parker Creek, and high to moderate densities of self-sustaining brook trout in the South Fork, Nye Creek and the headwaters of the Kinnickinnic River and Parker Creek systems. A small population of smallmouth bass and other warm water game fish are found near the confluence of the Kinnickinnic and the St. Croix River.

Trout habitat restorations upstream of the City of River Falls on the Kinnickinnic River, Parker Creek and the South Fork have been extensive, with over 12 miles of stream bank access available to anglers through fee title purchase or fishing easements. The watershed is heavily influenced by row crop agriculture and urban development and expansion from the Twin Cities Area. While agriculture has been very prominent in the watershed, it has shifted more toward high value row crop, center pivot irrigation and high capacity wells in the headwater regions. Minor concentrations of CAFO occupy parts of the watershed. Some fish kills have occurred in the past from inappropriate application of liquid manure. Urban growth is resulting in the expansion of impervious surfaces; however, local leaders are actively addressing impacts from storm water.

The main stem of the Kinnickinnic River is a large (25 miles long, 30 to 60 ft. wide) trout stream which is often divided into two portions, the “Upper Kinni” upstream of River Falls and the “Lower Kinni” downstream of River Falls. This trout stream is considered an Outstanding Resource Water and contains some of the highest brown trout densities in the State of Wisconsin and Midwest. The Upper Kinni flows primarily through agricultural crop land, the Kinnickinnic Fishery Area and parts of the Western Prairie Habitat Restoration Area before entering the City of River Falls. Public access is common throughout this section and parking is available in the Fishery Area and within the city limits. Invasion of the stream corridor by exotic or invasive trees threaten stream bank stability throughout this section and fine sediments from agricultural runoff plague the headwaters. There are two small active hydropower impoundments located within the City of River Falls.

The Lower Kinni enters a remote and environmentally sensitive river canyon downstream of River Falls. The reservoirs raise water temperature slightly, but not to the detriment of trout. Public access is limited to three locations. The river flows through the City of River Falls’ Glen Park, private land (much of which is under fishing and scenic easements through the Kinnickinnic River Land Trust) and Kinnickinnic River State Park.

Lake Pepin

This watershed is comprised primarily of three classified trout streams - Isabelle Creek, Pine Creek, and Bogus Creek - and a few small feeder creeks. Large intermittent streams and numerous dry runs drain to these streams. The Isabelle Creek headwaters are heavily farmed for row crops. The headwaters are warm water and remain unclassified. As the stream heads south the gradient and temperatures improve and the stream becomes Class III brown trout water. The stream eventually enters an extensive, heavily wooded coulee where the stream becomes Class II trout water for seven miles before entering Lake Pepin. Several springs originate in the coulee, one of which is part of the Valley Springs Trout Farm. The Class II portion of Isabelle Creek is known for its scenic beauty, moderately dense, high quality trout fishery, but most of the stream is small and fishing is often limited to deep pools. Town roads travel along and across the stream, but no public easements or land is available to the public. Isabelle Creek is prone to flooding and receives wastewater discharges from the Village of Ellsworth and a cheese factory in town. Water quality issues related to wastewater have occurred in the past. Public access would be desirable in the vicinity of Esdaile.

Pine and Bogus Creeks lie within small relatively protected sub-watersheds. While intensive row cropping occurs in the headwaters, most of the sub-watersheds lie in heavily forested coulees. Flooding can be an issue on occasion. Pine Creek is considered a "gem" because of the fishery and scenic setting. It is only 2.6 miles long and originates from numerous spring feeders a short distance upstream of Lake Pepin. It is a Class I brook trout stream that supports some of the highest self-sustaining brook trout populations in the State of Wisconsin. Brown trout populations have increased recently. It is very angler-friendly and much of the stream has been recently restored through intensive in-stream habitat improvement. A transaction with West Wisconsin Land Trust has converted most of the stream to state ownership, which is now managed as a Fishery Area. Bogus Creek contains fewer springs and fine sediments limit its potential. Currently, it is a Class II brook trout stream for 4.2 miles. It has moderate trout densities; however, habitat for large brook trout is in short supply. Town road access is somewhat limited and no other public access is available.

Rush River

This watershed is huge and is primarily comprised of six named trout streams and numerous small cold water feeder streams. The headwaters of the Rush River and its tributaries consist of a very large complex of intermittent streams draining south central St. Croix and central Pierce Counties. The Rush River main stem is very large (often 60 ft. in width) and is the most popular brook and brown trout stream in the area. It is recognized for its phenomenal brown trout fishery and great size structure and considered by many to be better than the Kinnickinnic River.

It originates in south central St. Croix County cropland, where it is classified as Class II brown trout water for 3 miles. Currently, the Rush is classified as Class II for 27.6 miles in Pierce County, however the stream has not been stocked for over five years and is currently being reclassified as Class I trout water. As the stream flows south into Pierce County, the gradient and thermal regimes improve and the stream begins its descent through a large, wooded scenic coulee, intermixed with farm land. Road access is plentiful and the DNR has just begun purchasing fishing easements on the river. Currently, nine fishing easements and one parcel in fee are available to anglers. The US Army Corp of Engineers owns a significant amount of acreage on the lower end of the Rush. Both the Ellsworth Rod and Gun Club and the Eau Galle Rush River Sports Club own significant stream frontage open to anglers. The town of Martell has a small park and West Wisconsin Land Trust has additional stream frontage open to angling.

The Rush is considered an Exceptional Resource water; however, the large watershed and intensive agriculture accelerates storm runoff resulting in annual flooding. A concentration of large dairy farms in the headwaters and

the application of liquid manure on a large scale have been problematic to maintaining good water quality and preventing fish kills in the headwaters of St. Croix County. Trout habitat work has focused on treating isolated trouble spots due to old mill dams or excessive erosion from down cutting.

The Rush River has two medium sized tributaries, Cave Creek and Lost Creek. Both are classified as Class I brook and brown trout water for 3.8 and 5.3 miles, respectively. These streams drain intensively row cropped farmland and pass through scenic, heavily wooded coulees. Trout populations are moderate and brook trout are most prevalent in the headwaters. The streams are very high gradient and the streambeds are often armored with natural limestone. Because of the armored stream bottom, the availability of pool habitat limits the number of larger trout. Anglers find both streams interesting to fish and they can provide good fishing opportunities when the Rush River is turbid. Several fisheries easements have been purchased recently on Lost Creek. Road access is plentiful on Lost Creek. Public access to Cave Creek is needed. No habitat improvement has occurred on these streams but it is needed to create pool habitat for adult fish.

Numerous small classified feeder creeks drain directly into the Rush River. Most are small, 1 to 2 miles long, and support low to moderate densities of brook and/or brown trout. Most originate in small coulees interspersed with woods and farmland. Many lack cover for adult trout and are difficult to fish.

Trimbelle River

This watershed is comprised of four named Class II trout streams, including the Trimbelle River, Goose Creek, Spring Creek and Little Trimbelle River, along with many intermittent streams. The mainstem of the Trimbelle River is a moderate to large Class II brown trout stream for over 20 miles. It is partially dependent on stocking to support a fishery and it locally known for a moderately dense, high quality trout fishery for most of its length. Fishability on the lower three quarters is excellent.

Both Spring Creek and Goose Creek are small, less accessible and have remnant populations of brook or brown trout. The streams are subject to flooding, the habitat is poor, and banks are heavily eroded. The Little Trimbelle is slightly more than 5 miles long and supports a moderately dense population of self-sustaining brook and brown trout. Brook trout are prevalent in the headwaters. Adult fish habitat is often limited to deeper pools. The watershed is heavily influenced by intensive row cropping, some grazing occurs in the lower reaches.

The headwaters of the Trimbelle and Goose Creek are impaired by extensive wetland complexes and/or beaver dams. Habitat in the Trimbelle is plagued by excessive fines from bank erosion and weak water temperature regimes. Habitat conditions and trout densities are best downstream from USH 10, where the river gradient, substrate and temperature regime improves. Beaver control occurs annually in the headwaters and at least six major stream bank restoration projects have been completed since 1988, along with a number of smaller projects. DNR easements are limited to several parcels, however a few 20-25 year county conservation easements are still present on the river. Road access is excellent. Some DOT and township park land provide excellent stream access and fishing opportunities.