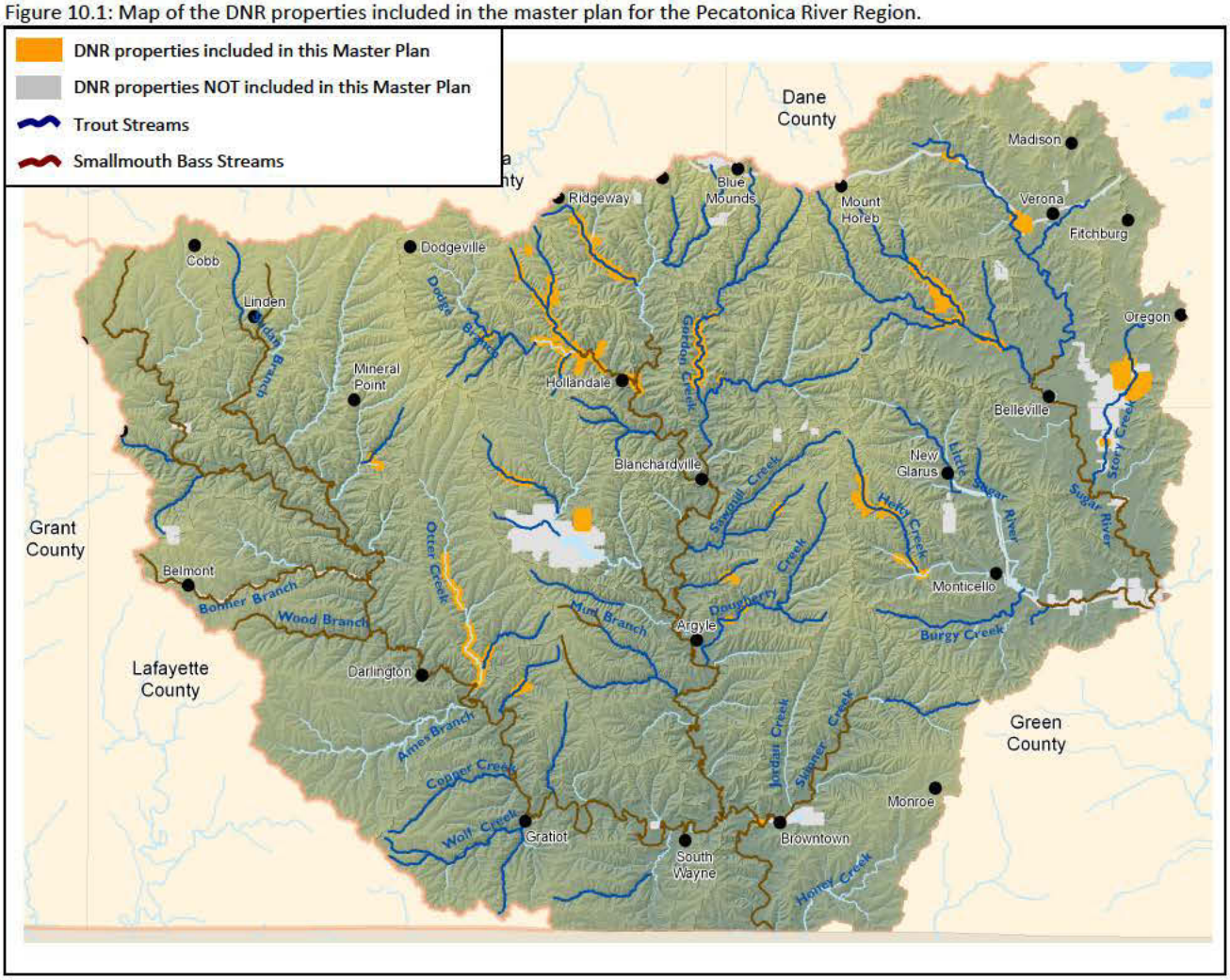
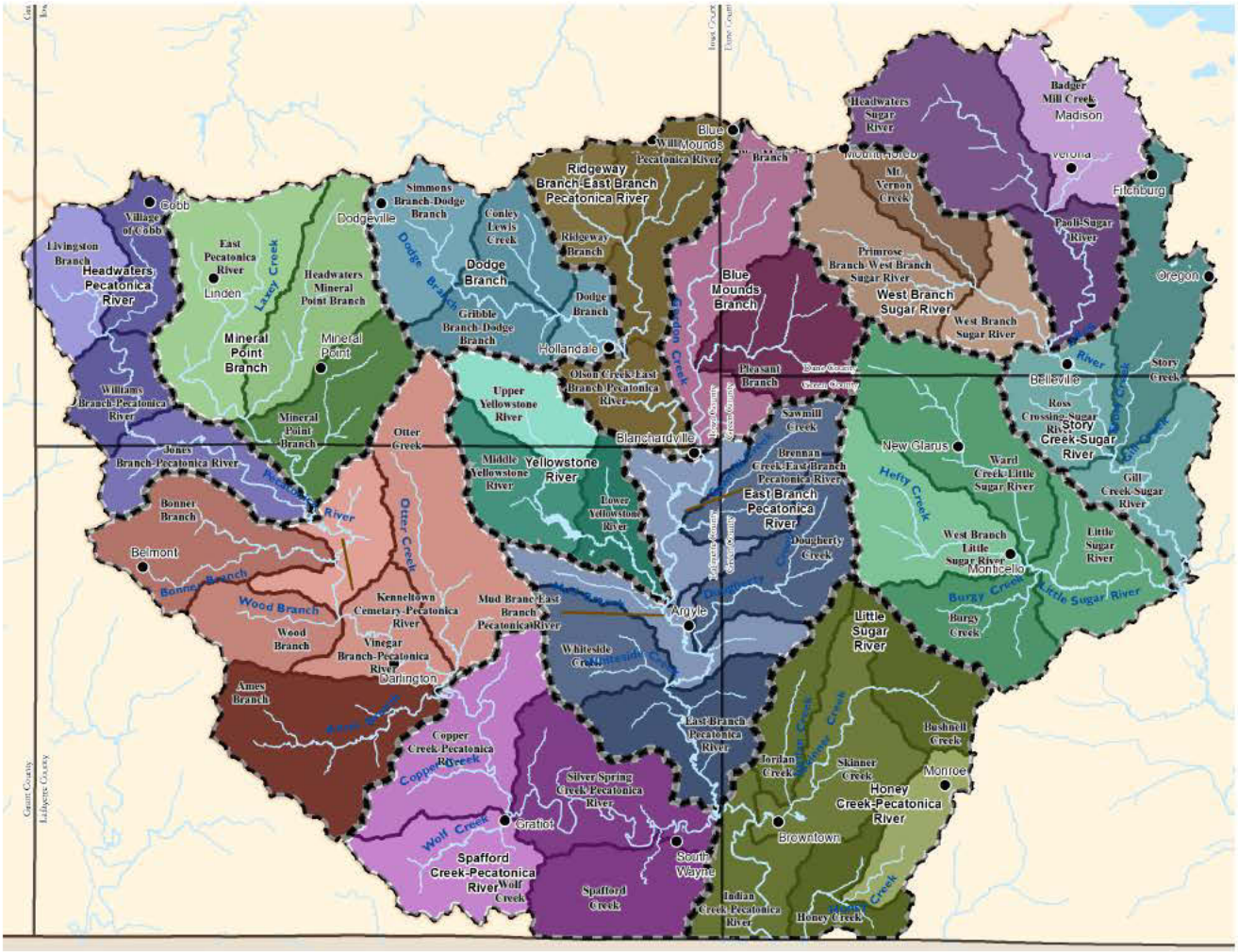
CHAPTER 10: PECATONICA RIVER REGION

Figure 10.1: Map of the DNR properties included in the master plan for the Pecatonica 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 10.2: Watersheds and Sub-Watersheds of the Pecatonica River Region.



1. OVERVIEW

a) Physical Environment

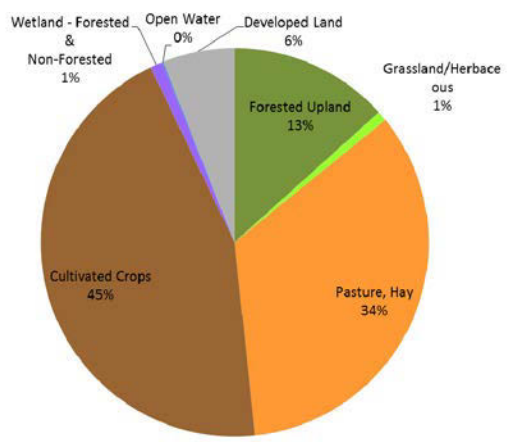
Bordered on the north by Military Ridge, this region tilts gently to the south with broad, open plains falling off to narrow, incised valleys. Soils are typically well drained silty and loamy with a silt loam surface over calcareous and non-calcareous clayey, sandy, or loamy residuum, or over non-calcareous silty loess. Most areas are over dolostone, limestone, or sandstone bedrock. 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. Sandstone and limestone outcroppings are common, though less so than regions north of Military Ridge.

b) Land Cover and Use

This Planning Region in dominated by agriculture with the majority in row crops (Figure 10.3). 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.

Dry to mesic forests are found along the sides of the narrow valleys with wetlands confined to the riparian zones along larger rivers. Most forests are managed to provide timber products ranging from firewood to sawtimber.

Figure 10.3: Land cover of the Pecatonica River Region.



c) Terrestrial Habitats

This region harbors southern Wisconsin's best opportunities for prairie management and restoration. In particular, the remnant native and restored prairies, pastures, hay fields, and CRP lands found south of Blue Mounds have some of the highest concentrations of grassland birds remaining in the state. Grassland birds are among the continent's most imperiled groups of birds. The Department recently established a project here, the Southwest Wisconsin Grassland & Stream Conservation Area.[1] Common natural community types found in this region include southern dry and dry-mesic forests, southern sedge meadow, and shrub-carr. Less common to rare natural communities include southern mesic forest, dry prairie, oak opening, and dry cliff. 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

Although the larger streams and rivers in the region continue to suffer from some pollution problems, many of the smaller streams have experienced dramatic improvements in water quality over the last several decades, thanks in large part to the installation of vegetation buffers and grass drainage swales in farm fields. Although the overall biotic diversity of coldwater streams generally decreases as water quality improves, the remaining species are more environmentally sensitive and have narrower thermal tolerances. 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.[2]

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[1] See the DNR's website (dnr.wi.gov) and search for "southwest grassland."
[2] Watershed Basin Reports are posted on the DNR's web (dnr.wi.gov); search for "basins."

e) Threatened, Endangered, 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. Fish species of concern found within this region are the Silver Chub, Least Darter, Redside Dace, and Weed Shiner. Threatened species include the Black Buffalo, River Redhorse, and the Redfin Shiner. Endangered species include the Gravel Chub, Slender Madtom (extirpated from much of its historical range), and the Starhead Topminnow. To date, two rare species are known to occur within the study stream properties of this region; one state-Endangered plant, and one special concern plant. For a complete list of these species, by property, see Appendix C of the "Rapid Ecological Assessment for Driftless Area Streams" (Appendix 2).

f) Invasive Species and Other Species of Management Concern

Mosquitofish have been documented in the Sugar River oxbow habitats. Lafayette County has been infested with Japanese Hops (among other species) that have radically changed the vegetation found along stream banks and the riparian corridor. Currently there is limited concern of the Asian Carp species migrating up the Pecatonica system. Dams located on the Rock River in Illinois may prevent upstream migration of exotic species.

g) Social and Recreation Issues

This Planning Region is easily accessible to residents of Madison and surrounding communities, so streams in the Pecatonica River Region with public access tend to receive heavy fishing pressure. With the improving water quality in many streams in the region and the corresponding increase in fish populations (combined with the increasing cost of travel), it is likely that some angling trips originating in Madison that previously targeted streams in Richland, Crawford, Vernon and counties further north now occur on streams here (as well as in the Lower Wisconsin River Region). As with the rest of the state, silent sports are increasingly popular in the Pecatonica River Region. In particular, the advent of small personal kayaks has resulted in some of the river systems becoming paddling destinations.

Although some other minor recreational uses compatible with angling occur on some of the properties included in this master plan (e.g., dog walking, bird watching, and geocaching), the size, shape, and soils of most properties restrict their recreational potential. Further, lands on which the Department has acquired a fishing access easement often do not allow other recreational uses. On some of the parcels that the Department owns, the agency has entered into land use agreements with local clubs that allow snowmobiling on designated trails.

h) Cultural Resources

Archaeological sites representing all of the recognized prehistoric culture periods are found in the area, ranging 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, and more. Although present, the area evidences relatively few animal-shaped effigy mounds. Historic period sites (ca. 1650-present) include farmsteads, dams, sawmills, cemeteries, abandoned mines, and others. The area's river towns, villages, and rural roads are dotted with historic residences, businesses, bridges, and other early structures, many used continuously to this day. The many historic structures found in the town of Mineral Point, including the National Register-listed site of Pendarvis, are excellent examples.

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 PECATONICA RIVER REGION

a) DNR and other public and private conservation lands[3]

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

	Properties included in this Master Plan															
	Fisheries Management Program															
	State Fishery Areas		Remnant Program		Streambank Protection		Scattered Habitat		Other*		Wildlife Program	End. Resources Program	TOTAL for properties included in this Master Plan	Other DNR Lands	Other Public & Private Conservation Lands**	TOTAL
	Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease						
Ames Branch - Pecatonica River	0	0	0	166	0	0	0	0	0	0	0	0	166	258	3	**428**
Bonner Branch														256	1	257
Kenneltown Cemetary - Pec. R.														2		2
Otter Creek				162												162
Vinegar Branch - Pec. River				4											2	6
Blue Mounds Branch	0	0	0	86	0	0	0	0	0	0	0	0	86	101	146	**333**
Pleasant Branch				2										41		43
Blue Mounds Branch				84										61	146	291
Dodge Branch	0	0	0	29	0	243	0	0	0	0	0	0	272	37	0	**308**
Conley Lewis Creek						141								1		142
Gribble Branch - Dodge Branch				21		46										66
Dodge Branch				8		56										64
Simmons Branch-Dodge Branch														35		35
East Branch Pecatonica River	0	8	0	11	0	5	0	0	0	0	0	0	24	66	0	**90**
Sawmill Creek						5								66		72
Brennan Creek - EB Pec. River		8														8
Dougherty Creek		0		11												11
Headwaters Pecatonica River	0	0	0	0	0	0	0	0	0	0	0	106	106	199	0	**305**
Jones Branch - Pec. River														199		199
Williams Branch - Pec. River												106				
Headwaters Sugar River	0	0	0	0	14	0	0	0	0	0	0	270	284	375	758	**1,417**
Badger Mill Creek														73	476	549
Paoli-Sugar River														159	11	170
Headwaters Sugar River					14							270		143	271	699
Honey Creek - Pecatonica River	0	0	0	0	0	0	0	0	0	5	0	0	5	640	0	**644**
Skinner Creek										5				640		644
Little Sugar River	0	0	0	0	0	102	0	0	0	0	0	0	102	276	101	**479**
Burgy Creek															21	21
Little Sugar River															80	80
West Branch Little Sugar River						102								276		378

[3] Watersheds and sub-watersheds without any DNR lands are not listed.

	Properties included in this Master Plan															
	Fisheries Management Program															
	State Fishery Areas		Remnant Program		Streambank Protection		Scattered Habitat		Other*		Wildlife Program	End. Resources Program	TOTAL for properties included in this Master Plan	Other DNR Lands	Other Public & Private Conservation Lands**	TOTAL
	Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease	Fee	Ease						
Mineral Point Branch	0	0	0	13	0	0	0	0	0	0	0	0	13	0	0	**13**
Mineral Point Branch				13												
Ridgeway Branch - EB Pec. R.	0	0	10	136	0	10	0	0	0	0	0	0	156	787	1,857	**2,800**
Ridgeway Branch			10	129										27		166
Williams Creek - EB Pec. River						7								760	1,838	2,605
Olson Creek - EB Pec. River				7		3									19	29
Spafford Creek - Pecatonica River	0	0	0	25	0	0	0	0	0	0	0	0	25	52	0	**77**
Copper Creek - Pec. River				25												25
Silver Spring Creek - Pec. River														52		52
Story Creek - Sugar River	0	0	0	0	274	439	0	0	0	0	0	0	713	2,857	0	**3,570**
Story Creek					274	439								2,203		2,915
Gill Creek - Sugar River														423		423
Ross Crossing - Sugar River														231		231
West Branch Sugar River	376	28	0	0	0	51	0	0	0	0	0	0	456	143	556	**1,155**
Mt. Vernon Creek	336	28													405	769
Primrose Branch - WB Sugar R.	41					18								11	79	149
West Branch Sugar River						33								132	72	236
Yellowstone River	0	0	0	6	238	17	0	0	0	0	0	0	261	4,842	0	**5,104**
Middle Yellowstone River				6	238	17								4,574		4,835
Lower Yellowstone River														268		268
TOTAL	***376***	***36***	***10***	***472***	***526***	***868***	***0***	***0***	***0***	***5***	***0***	***376***	***2,669***	***10,633***	***3,421***	***16,723***

* 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).

ii) By DNR Property (acres):

	Fee	Easement	Total
Fish Management Program			2,293
State Fishery Areas			
BRENNAN CREEK FISHERY AREA	-	8	8
MOUNT VERNON CREEK FISHERY AREA	377	28	405
Remnant Habitat Projects			
REM-CANNON BRANCH	-	5	5
REM-CANNON CREEK	-	2	2
REM-CONLEY SMITH CREEK	10	129	139
REM-DODGE BRANCH	-	21	21
REM-DOUGHERTY CREEK	-	11	11
REM-E BRANCH PECATONICA RIVER	-	15	15
REM-GORDON CREEK	-	86	86
REM-LOVETTS CREEK	-	25	25
REM-OTTER CREEK	-	166	166
REM-ROCK BRANCH	-	13	13
Stream Bank Protection	940	454	1,394
Other*	-	5	5
Natural Areas Program			376
STATEWIDE NATURAL AREA	376	-	376
Wildlife Management Program			-
None			-
Total	**1,702**	**967**	**2,669**

* Includes nonpoint easements, scattered habitat lands, wetland mitigation, watershed management projects, public access sites, 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 Pecatonica 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	10%
Wetlands (inc. lowland forests)	30%
Forests (upland)	40%
Agricultural lands	20%
	100%

These habitats are managed following the strategies described in Chapter 2.4, unless noted below.

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

In many of the trout waters here, the Department has shifted in-stream techniques to the use of root wads, backwaters, and vortex weirs in lieu of riprap and LUNKER structures. In addition, management focuses more on removal of floodplain sediment rather than thin spreading of deposits. The formerly accepted practice of grading and sloping of deposited sediments is now often replaced with sale and removal of these high quality soils.

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

Primary Sites

None identified in the Rapid Ecological Assessment (see Appendix 2).

State Natural Areas

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

Pecatonica River Woods – Iowa County, 106 acres.

Pecatonica River Woods features a mosaic of natural community types including southern dry, dry-mesic, and mesic forest; floodplain forest; and a three-quarter mile segment of the Pecatonica River. The most significant feature of the site is the only known Wisconsin population of the state-endangered plant species fire pink. Also present are populations of the state-endangered beak grass and three special concern plant species - heart-leaved skullcap, American gromwell, and great Indian plantain. Other plants include Short's aster, great waterleaf, toothed cress, and grass sedge. A three-quarter mile stretch of the Pecatonica River flows through the site flanked by floodplain forest of silver maple and ash. To the east is a hillside with second-growth dry to mesic forest with white oak near the ridge top and red oak, black cherry, black walnut, and sugar maple sloping down to the river. Pecatonica River Woods is owned by the DNR and was designated a State Natural Area in 1992.

Sugar River Wetlands – Dane County, 270 acres.

Sugar River Wetlands features a diverse wetland complex including sedge meadow, calcareous fen, emergent aquatic, shrub-carr, and wet-mesic prairie. Located within the Upper Sugar River Watershed, this extensive wetland harbors numerous rare plant and animal species and contains the most diverse fishery in southern Wisconsin. The fen flora is diverse with many calcium-loving plants including Kalm's lobelia, grass-of-parnassus, and shrubby cinquefoil. The carbonate-rich groundwater that percolates up from the underlying bedrock provides high quality water to the surrounding wetlands and river. Intergrading with the fen is a wet-mesic prairie dominated by tall grasses including big blue-stem, Canada blue-joint grass, prairie cord grass, and Canada wild rye. The forb component is diverse with azure aster, shooting star, prairie blazing-star, prairie phlox, and Culver's root. Also present is a southern sedge meadow with tussock sedge and a shrub-carr community dominated by tall shrubs such as red-osier dogwood, meadowsweet, and willows. Within these communities are a number of rare plants including the state threatened prairie parsley and two special concern species, bluets and glade mallow. Short-eared owls frequent this area in winter and northern harriers nest within adjacent wetlands.

The area is part of a larger grassland habitat restoration complex along the Sugar River, which seeks to establish landscape management areas for the benefit of declining grassland birds and animals, vegetation communities, and invertebrates that depend upon native vegetation. Sugar River Wetlands is owned by the DNR and was designated a State Natural Area in 1996.

c) Recreation facilities in this region.

See Appendix 3.

d) Other issues and challenges in this region.

Given the region's close proximity to Madison and the large number of people in the general area, the properties experience some illegal uses such as dumping and littering. Additionally, participants in recreation activities that have limited opportunities in the region, such as horseback and ATV riding, are often looking for public lands to pursue these activities. Although the primary recreation purpose (angling), narrow configuration, small size, soils, and locations of fishery properties do not make them well suited to accommodate most other uses, the Department periodically receives requests to incorporate a broader range of uses on fishery properties in the region.

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

Figure 10.4: Overview report card of the Pecatonica River Region

Grade methods are detailed 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													
			Ames Branch - Pecatonica River	Blue Mounds Branch	Dodge Branch	East Branch Pecatonica River	Headwaters Pecatonica River	Headwaters Sugar River	Honey Creek - Pecatonica River	Little Sugar River	Mineral Point Branch	Ridgeway Branch - E B Pecatonica	Spafford Creek - Pecatonica River	Story Creek-Sugar River	West Branch Sugar River	Yellowstone River
Brook Trout	Stream Health and Habitat Quality	Natural Habitat Potential	F	F	F	F	F	C	F	F	F	F	F	C	D	F
		Land Use Stress	F	F	F	F	D	F	F	F	F	D	F	F	F	F
	Sport Fishery Performance	Stock (5" up to 8")	F	F	F	F	F	F	F	F	C	F	F	C	D	F
		Quality (8" up to 12")	F	F	F	F	F	F	F	F	D	F	F	C	C	F
		Memorable (12" +)	F	F	F	F	F	F	F	F	B	F	F	D	F	F
	Projected resilience to climate change		D	D	D	D	D	D		D	D	D		D	D	D
Brown Trout	Stream Health and Habitat Quality	Natural Habitat Potential	B	A	A	B	D	A	D	B	A	A	D	D	A	A
		Land Use Stress	F	B	F	D	F	F	D	D	F	B	F	D	D	D
	Sport Fishery Performance	Stock (6" up to 10")	F	B	C	D	D	C	D	C	C	D	D	A	A	C
		Quality (10" up to 15")	F	B	D	C	C	B	D	D	B	C	F	A	B	D
		Memorable (15" +)	F	B	F	F	F	A	F	F	F	F	F	B	B	F
	Projected resilience to climate change		D	C	D	B	D	D	C	B	C	C	D	C	C	D
Small-mouth Bass	Stream Health and Habitat Quality	Natural Habitat Potential	B	D	F	B	C	D	A	C	C	C	B	C	D	C
		Land Use Stress	B	F	B	D	C	C	F	F	D	F	B	D	D	B
	Sport Fishery Performance	Stock (8" up to 14")	F	F	F	F	B	F	D	D	A	F	F	A		B
		Memorable (14" +)	F	F	F	F	F	F	F	D	A	F	F	A		F
	Projected gain from climate change		A	B	A	A	A	A	A	B	A	B	A	D	B	A
Trout Stream Habitat	Thermal resilience of trout streams		B	D	D	C	C	D	A	D	C	D	D	C	D	A
	Total miles of trout stream restoration		F	A	B	F	F	F	F	F	F	F	D	F	A	D
Recre-ation	Angling opportunities	Percent of trout stream miles with public access	B	C	A	D	D	C	F	C	D	B	D	A	B	A
		Percent of smallmouth bass stream miles with public access	C	F	A	F	D	F	D	A	F	D	F	B	F	F
	Supply relative to demand	Miles of publicly-accessible trout and SMB streams per 100K people within a 1-hour drive	C	C	C	D	D	D	D	C	D	C	D	C	B	C

a) Brook Trout

i) *Stream Health and Habitat Quality*

Figure 10.5 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle panel), and probability of occurrence (lower panel) for brook trout in the region.

Natural Habitat Potential

The region generally lacks good quality natural habitat for brook trout. The northeastern portion of the region harbors the best conditions for brook trout, mostly centered on the Mt. Vernon Creek and Story Creek. Sub-watersheds here that support brook trout are characterized by cold water with consistent baseflows. These tend to be in areas with forested lands where there is stable riparian vegetation and little or no ammonia run-off from manure spreading associated with livestock operations.

Land Use Stress

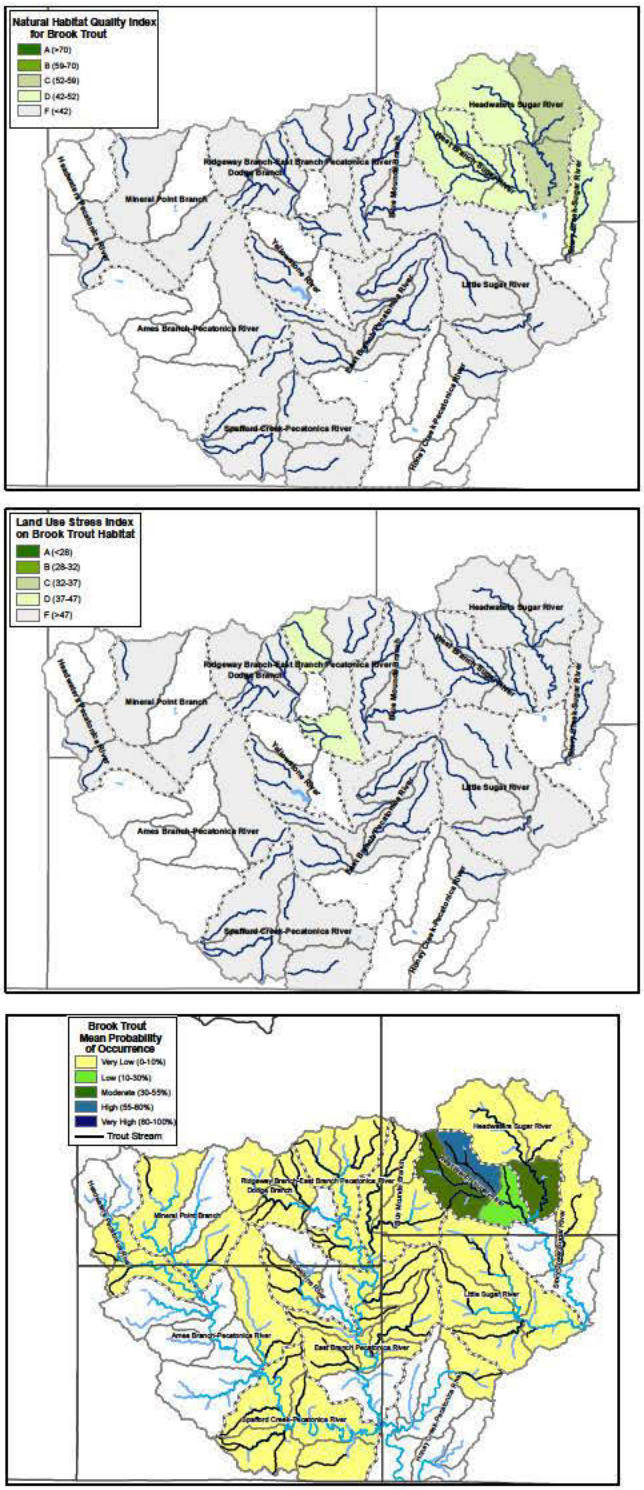
There is a very high level of anthropogenic stress for brook trout throughout the region. The two most influential variables in determining stress levels for brook trout are the lack of forest cover and the density of cattle within the network. Given the absence of forest cover (a natural condition that is consistent with the ecological needs of native biodiversity here) and the number of dairy and beef cattle, the region's high scores for stress are not unexpected.

The western Dane County brook trout streams are at the feet of several expanding "bedroom communities." Areas formerly dominated by pastures or agricultural crops (areas with infiltration) are now subject to increasing amounts of impervious surfaces. The expansions of Mt. Horeb, Verona and Barneveld-Ridgeway have resulted in considerable soil loss and sedimentation into headwater brook trout streams.

Probability of Occurrence

With the combination of very limited natural habitat potential and high land use stress, the probability of brook trout occurrence is severely limited to only portions of the Sugar River watersheds. Mt Vernon Creek has the highest probability of brook trout occurrence in the region. Although the model projects Story Creek to have a very low probability of supporting brook trout, stream survey data indicate, in fact, that part of the creek has quite a substantial population.

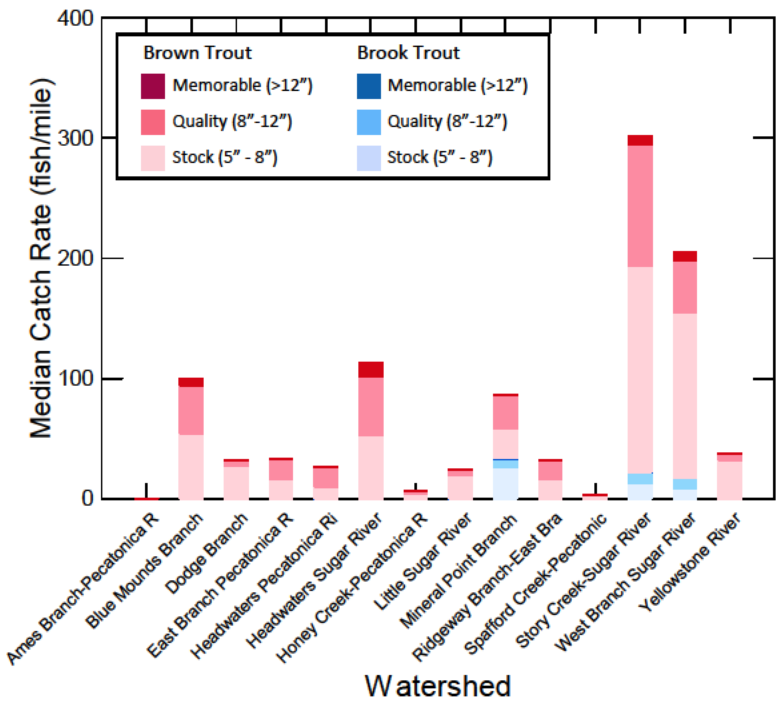
Figure 10.5: Natural habitat potential, land use stress, and probability of occurrence for brook trout in the Pecatonica River Region.



ii) Sport Fishery Performance

The trout waters in the Pecatonica River Region harbor predominantly brown trout (Figure 10.6).

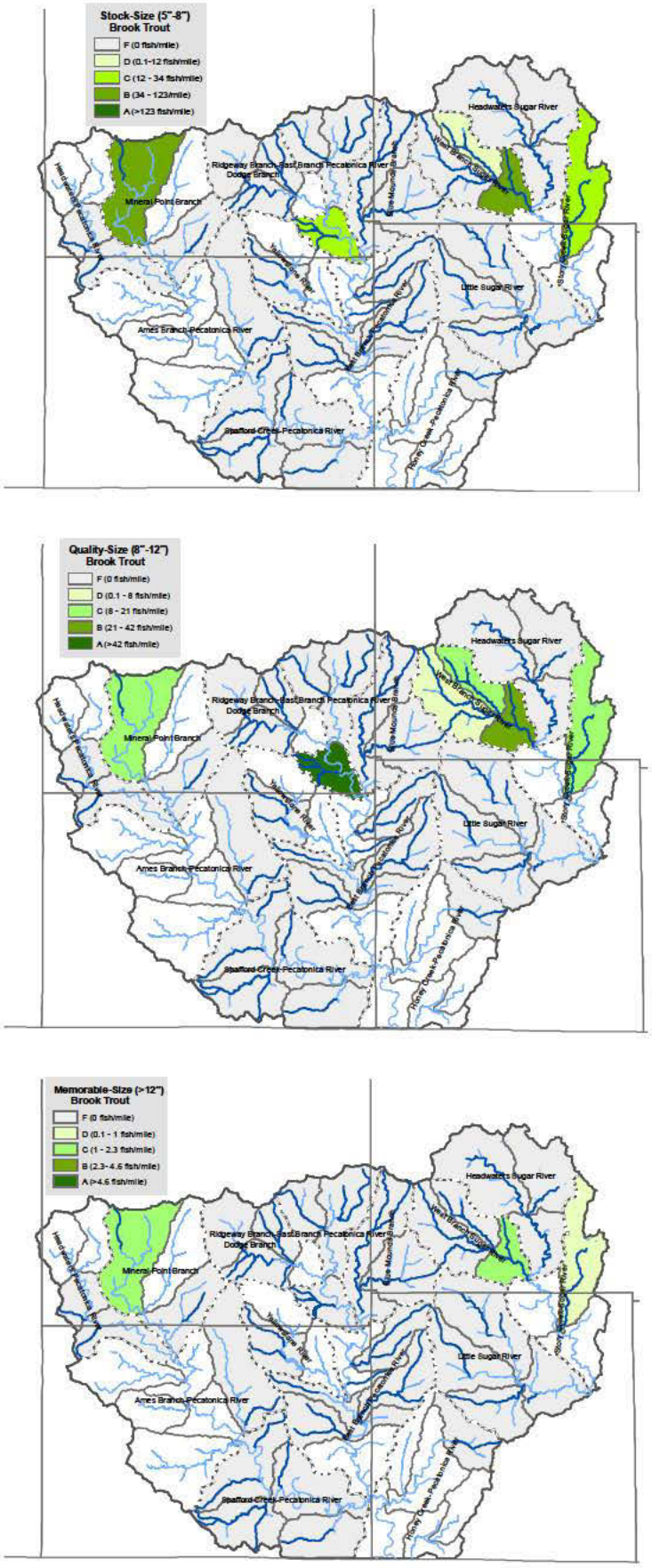
Figure 10.6: Brook and brown trout abundance in the Pecatonica River Region



Although brook trout are found in several headwater creeks, only three watersheds have median catch rates above zero. The most robust brook trout populations occur in Story Creek, Mt. Vernon Creek, Primrose Branch, and Sudan Branch (East Branch Pecatonica River sub-watershed). Brook trout are also found in lower numbers in the Headwaters of the Pecatonica River, Yellowstone River and Dodge Branch watersheds. In addition, there are a few small creeks in the eastern side of the planning region that may retain low density brook trout populations, due to the protected nature of their watersheds (many are within large wetland complexes) and lack of harvest. The Department's fish sampling program typically does not include these small streams, but it is likely that remnant brook trout populations occur in Schlapbach, Henry, and Ward Creeks and other similar waters.

Maps on the following page depict the distribution of different sized brook trout (Figure 10.7). These maps use the same data as shown in the above bar chart.

Figure 10.7: Brook trout density – stock, quality, and memorable sized fish.



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

Although it currently supports only a modest population of brook trout, projected future climate conditions suggest that the Pecatonica River Region will no longer support brook trout by the middle of the century.

Although the model does not project that brook trout currently occur in Story Creek (and thus can't be "lost"), fish sampling data confirm that the creek harbors a substantial population as it flows through the Brooklyn Wildlife Area. If Story Creek is affected similarly to other streams in the region, this population will very likely be reduced or absent by the middle of the century.

Figure 10.8: Projected climate effects on future brook trout distribution in the Pecatonica River Region (2046 to 2065).

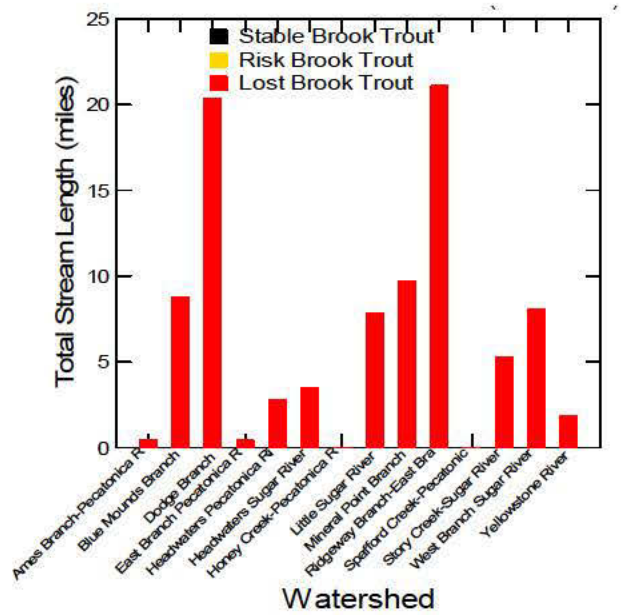
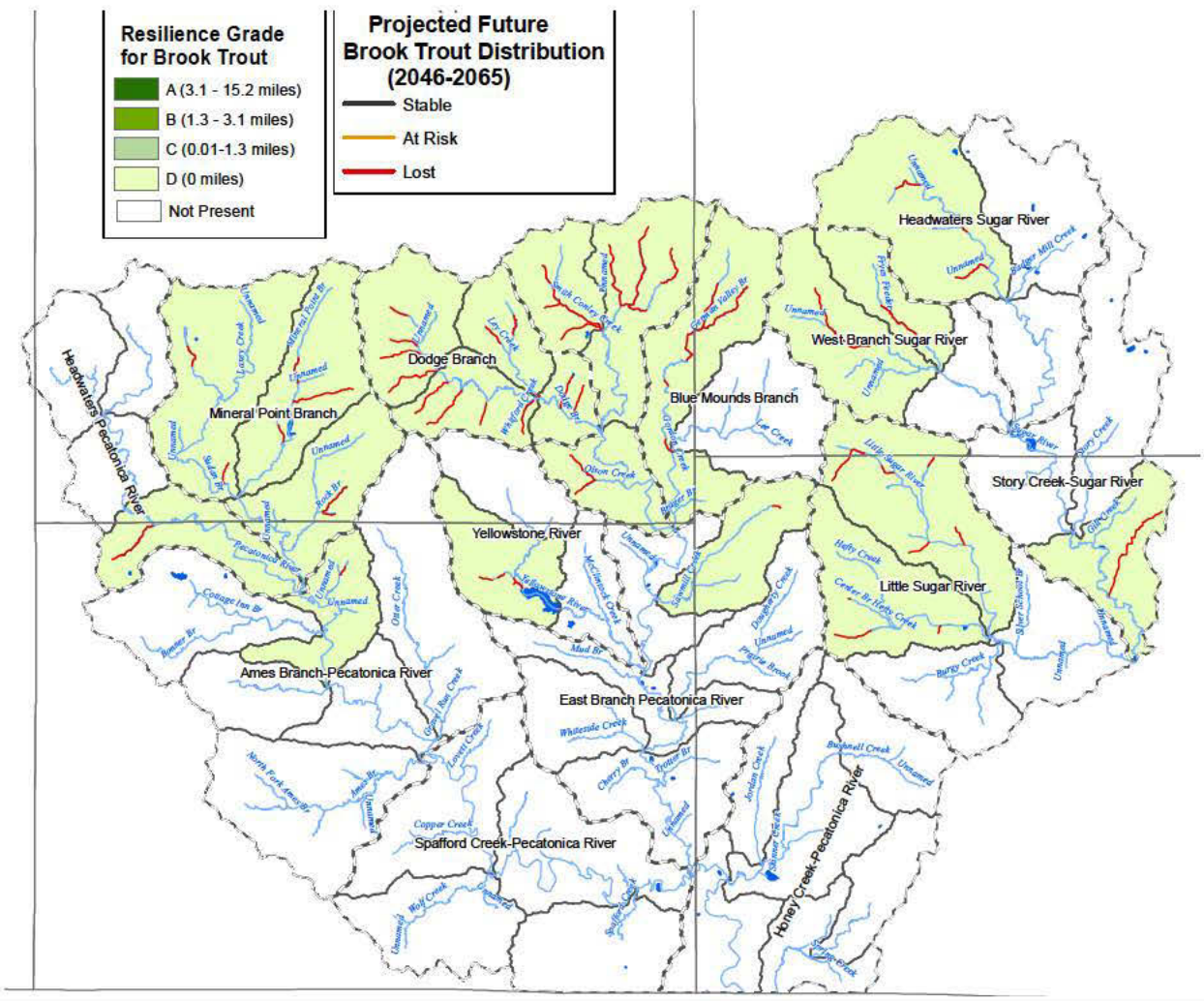


Figure 10.9: Projected future brook trout distribution and resilience in the Pecatonica River Region.



b) Brown Trout

i) *Stream Health and Habitat Quality*

Figure 10.10 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle panel), and probability of occurrence (lower panel) for brown trout in the region.

Natural Habitat Potential

The natural habitat for brown trout is noticeably better than for brook trout. High quality brown trout habitat occurs across much of the northern portion of the region, primarily the headwater creeks fed by springs along Military Ridge. These areas have the requisite over-winter depths, habitat diversity in terms of riffle –pool and substrate composition, and a good forage base.

Land Use Stress

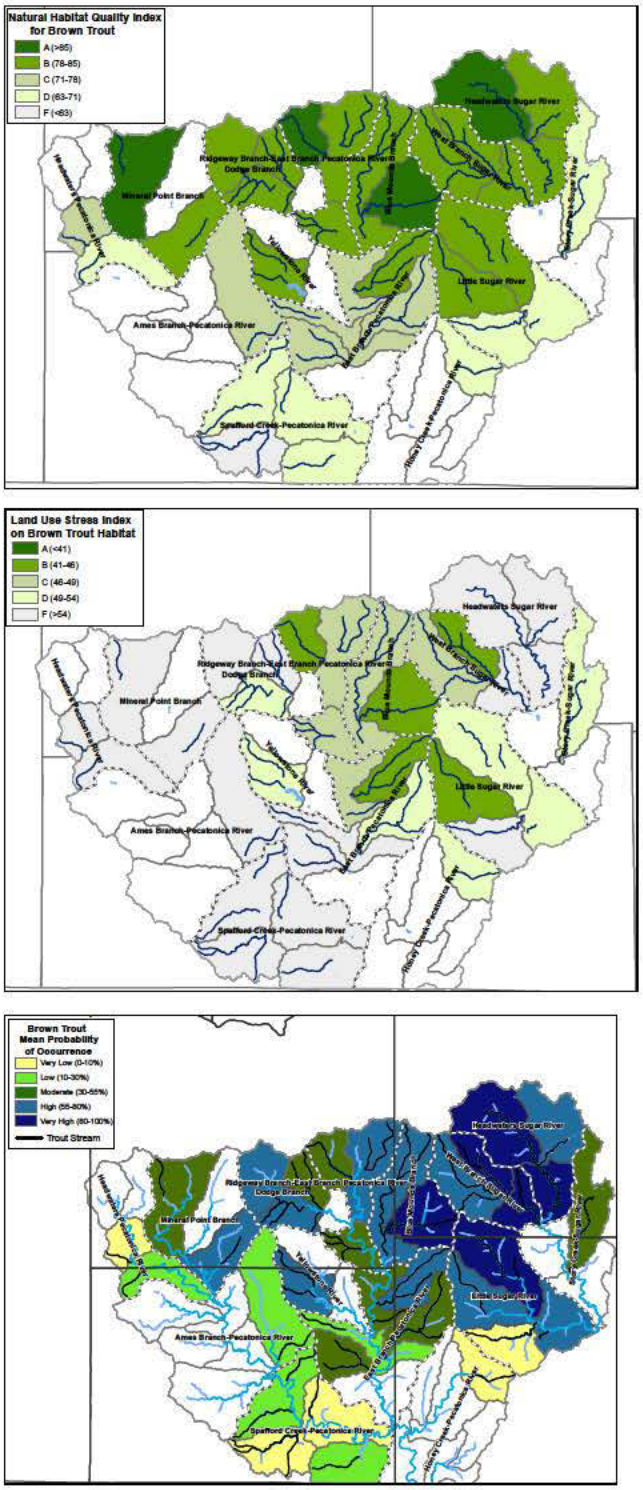
Brown trout stressors are more varied across the region. The areas along the fringe of Madison have higher levels of stress (likely primarily due to development and the lack of permanent vegetative cover in grasslands or forests). The central portion of the region -in western Dane, southern Iowa, and western Green counties- has only a modest level of anthropogenic stress. This area has been the focus of efforts by the DNR, The Nature Conservancy, and several other conservation groups to protect and restore a large mosaic of grasslands and prairies and the associated streams that flow off the ridge tops. The stressor level tends to increase along the western edge of the region, likely due to the increase in row crops here.

An emerging stressor is the threat of winter manure delivery from land-spreading of liquid animal waste. Several documented fish kills have occurred in the West Branch Sugar River, German Valley Branch (West Branch Blue Mounds sub-watershed), and others tributaries. While Dane County has a winter manure spreading ordinance and a permitting process, no parallel exists in Iowa County or westward.

Probability of Occurrence

The region's environmental conditions suggest that the highest probability of brown trout occurrence exists in the northeastern section, and indeed that is where survey data indicate the largest populations occur.

Figure 10.10: Natural habitat potential, land use stress, and probability of occurrence for brown trout in the Pecatonica River Region.

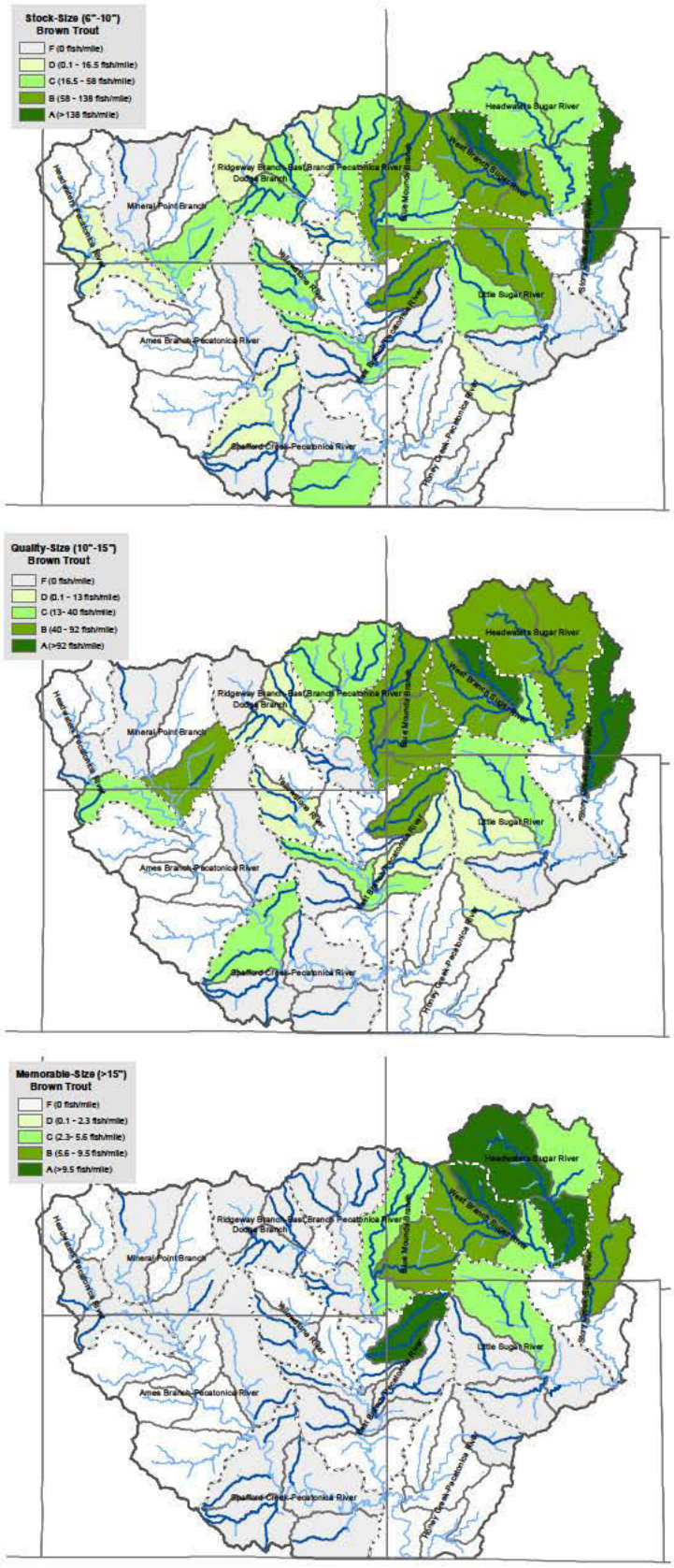


ii) Sport Fishery Performance

The Sugar River watersheds (Story Creek-Sugar River, West Branch Sugar River, Headwaters Sugar River) harbor the overwhelming majority of the trout in the region (Figure 10.11).

The large number of trout in the Sugar River system is due to a number of factors, including the targeted runoff management efforts whereby banks were stabilized, streams were narrowed, and their velocities increased. The resulting scouring, in addition to the placement of in-stream habitat and intensive riparian management to remove woody invasive species, contributed to a dramatic improvement in overwinter and spawning habitat, as well as resting cover for brown trout. In addition, there is more old pasture and smaller-scale row cropping systems here than the larger corn-soybean operations that exist in much of Iowa County. In addition, natural reproduction is present in all these sub-watersheds and is augmented with stocking, while harvest is generally modest.

Figure 10.11: Brown trout density – stock, quality, and memorable sized fish.



iii) Projected Resilience of Brown Trout to Climate Change

Projected climate conditions suggest that the Pecatonica River Region will see a range of impacts in future populations (Figures 10.12 and 10.13). For some waters, projected climate changes will have minimal to modest impacts. Of note are the West Branch Sugar River (Mt. Vernon Creek) and the Blue Mounds Branch (Gordon Creek), which are projected to see almost no loss of brown trout stream miles. Other waters are projected to see larger reductions in the distribution of brown trout. In particular, the streams in the Mineral Point Branch, Ames Branch-Pecatonica River, and Headwaters of the Pecatonica River watersheds are projected to see large declines in brown trout distributions. Much of the reduction in brown trout is projected to occur in second and third order streams.

In addition to the watersheds mentioned above, several sub-watersheds are projected to continue to support a large number of brown trout stream miles in the future. These include:

- Williams Creek – East Branch Pecatonica River
- Sawmill Creek
- Ward Creek – Little Sugar River
- West Branch Little Sugar River (Hefty Creek)
- Skinner Creek

Figure 10.12: Projected climate effects on future brown trout distribution in the Pecatonica River Region (2046 to 2065).

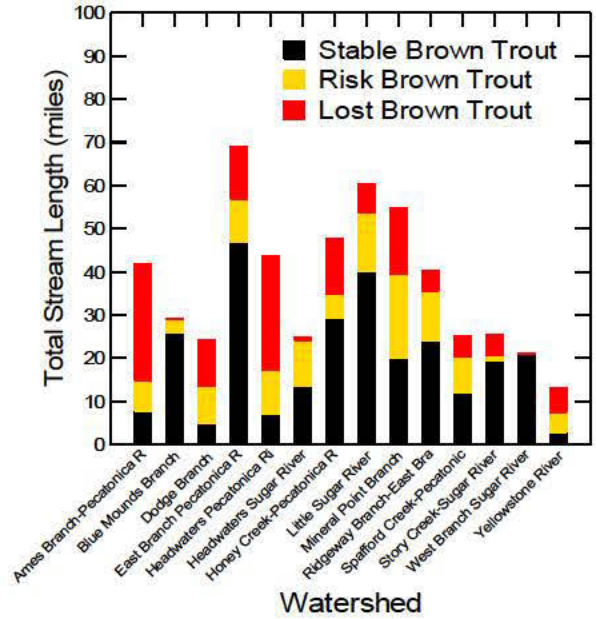
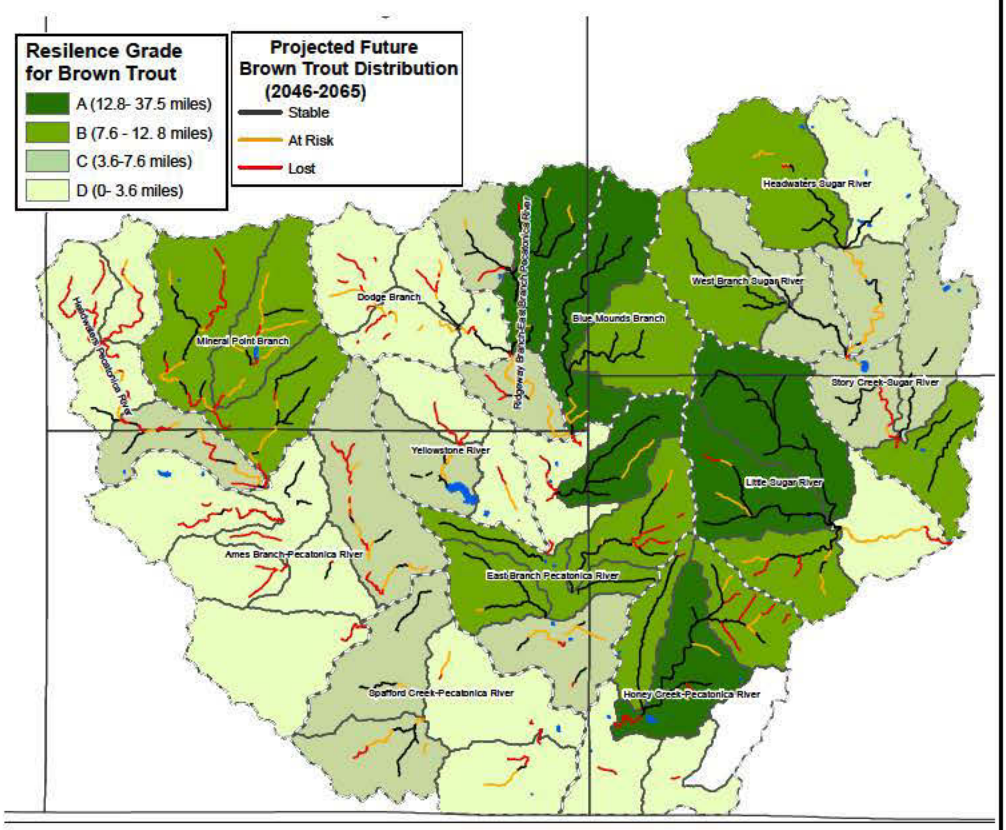


Figure 10.13: Projected future brown trout distribution and resilience in the Pecatonica River Region.



c) Smallmouth Bass

i) *Stream Health and Habitat Quality*

Figure 10.14 depicts, by sub-watershed, the current natural habitat potential (top panel), land use stress (middle panel), and probability of occurrence (bottom panel) for smallmouth bass in the region.

Natural Habitat Potential

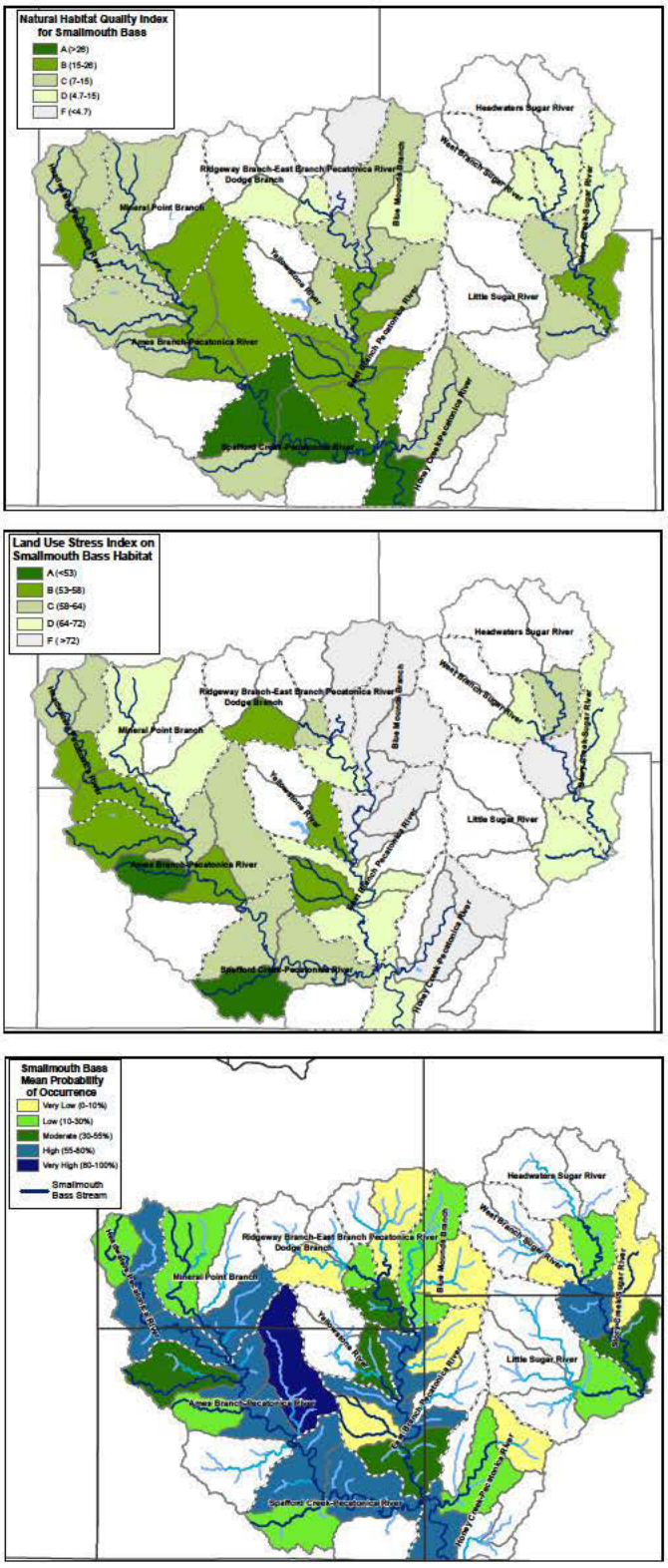
The Pecatonica River Region, along with the Platte River Region to the west, has high quality natural habitat for smallmouth bass in the Driftless Area. The waters here are large enough, warm enough, and fertile enough to support healthy populations of large bass. The lower stretches of the Pecatonica River support particularly impressive numbers of bass. The lower stretch of the Sugar River also has a significant smallmouth bass population.

Land Use Stress

The levels of anthropogenic stress on smallmouth bass also vary across the region. The largest smallmouth bass stressor is sediment and the accompanying nutrient and biological oxygen demand load. Sediment represents the greatest impact, in terms of loss of hard, clean rock substrates and interstitial space found in coarse bed materials. The negative impacts of sedimentation include loss of depth, reduction of suitable spawning and nursery cover, impacts to benthic invertebrates which serve as food resources for bass, as well as the periodic delivery of ammonia in concentrations sufficient to kill fish and aquatic life. The changes in livestock pasturing, feeding and waste management efforts parallel the changes in smallmouth bass densities in southwestern Wisconsin.

Smallmouth bass streams have also suffered fish kills from land spreading and poor storage techniques of liquid animal waste. In general, smallmouth bass streams do not have the buffering capacity of coldwater streams and are more likely to suffer from anthropogenic stress in the form of animal waste and sediment runoff. During the overnight period, smallmouth bass streams have naturally occurring dissolved oxygen sags which approach lethal levels. When these low dissolved oxygen levels are combined with an anthropogenic stress, the result is often a fish kill.

Figure 10.14: Natural habitat potential, land use stress, and probability of occurrence for smallmouth bass in the Pecatonica River Region.



Probability of Occurrence

The waters with the highest probability of smallmouth bass occurrence in the region are mostly associated with the Pecatonica River proper. The stream with the highest projected probability of occurrence, Otter Creek, used to have a high quality bass population several decades ago, but recently has suffered from poor water quality. As a result, the creek now supports only a very small population. The Sugar River also has a strong probability of occurrence, which is borne out in the stream sampling data.

ii) Sport Fishery Performance

As can be seen in Figures 10.15 and 10.16, smallmouth bass distribution is also varied, although there is some correlation with the higher densities of bass and the position of the watershed in the broader landscape. That is, the highest density of bass typically occurs in rivers that are large and warm enough to meet the life history needs of the fish, but still have significant gradient and less degraded water.

Many of the best smallmouth bass waters are tied hydrologically to large wintering habitat, notably in the Pecatonica and Sugar rivers. There is also a good correlation with higher densities of smallmouth bass and the amount of bedrock present. While the median values are zero, smallmouth bass are also found in low numbers in the Ames Branch-Pecatonica River, Dodge Branch, and Spafford Creek – Pecatonica River watersheds.

Figure 10.15: Smallmouth bass abundance in the Pecatonica River Region.

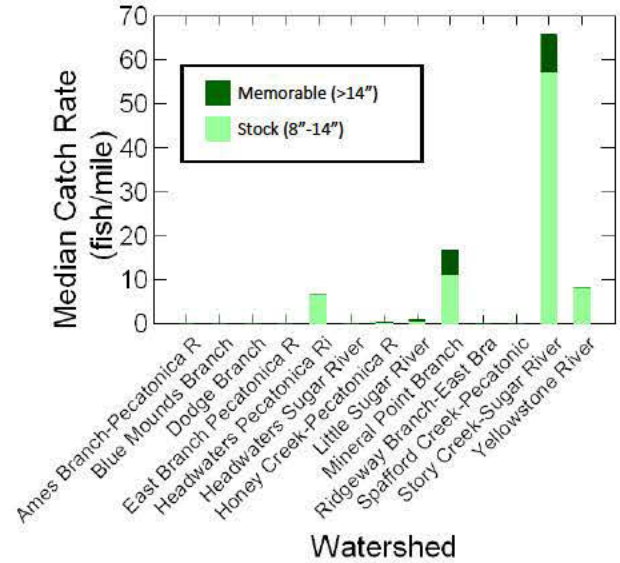
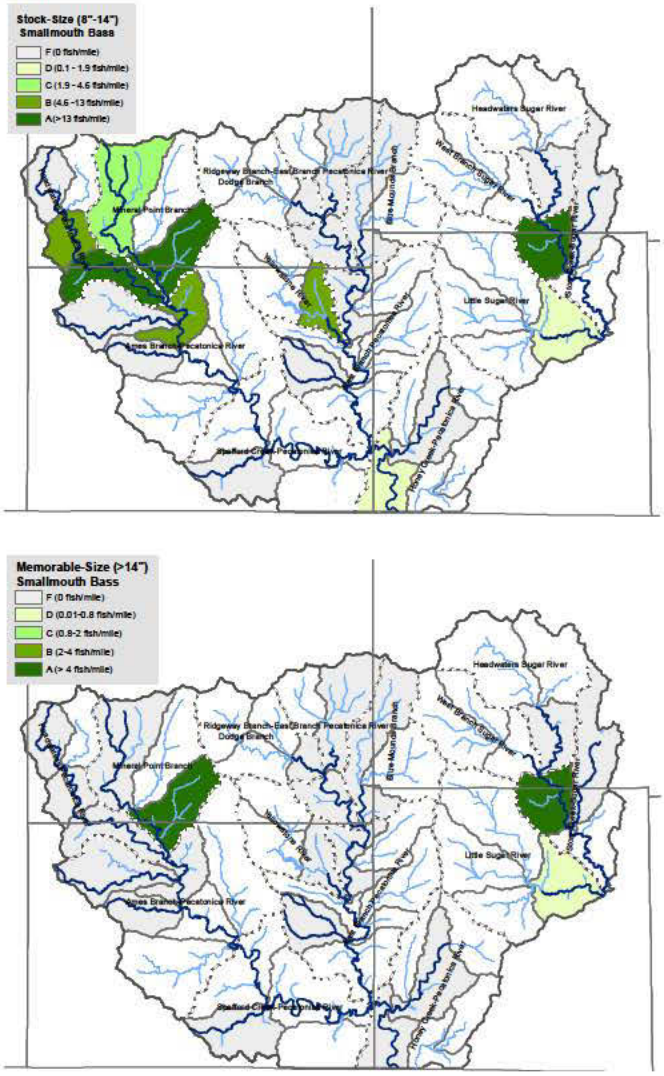


Figure 10.16: Smallmouth bass density – stock and memorable sized fish.



iii) Projected Gain of Smallmouth Bass from Climate Change

The distribution of smallmouth bass is projected to expand considerably in the region due to climate change, primarily in the larger rivers and streams along the western half (Figures 10.17 and 10.18). Although this represents a significant increase in the stream miles occupied by bass, it is only a subset of the waters where trout are projected to be lost.

Figure 10.17: Projected climate effects on future smallmouth bass distribution in the Pecatonica River Region (2046 to 2065).

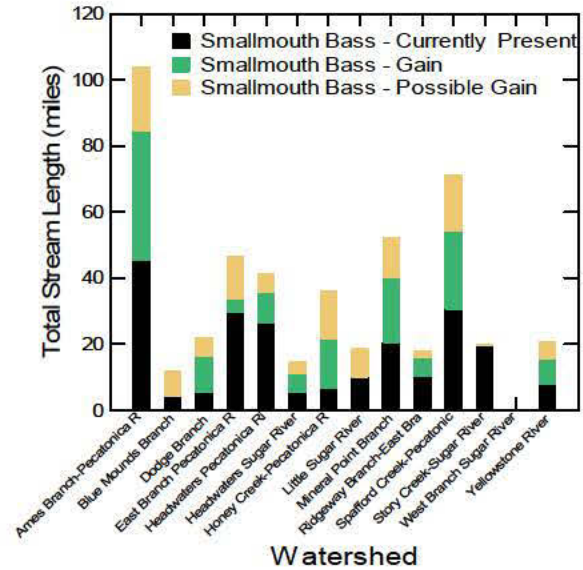
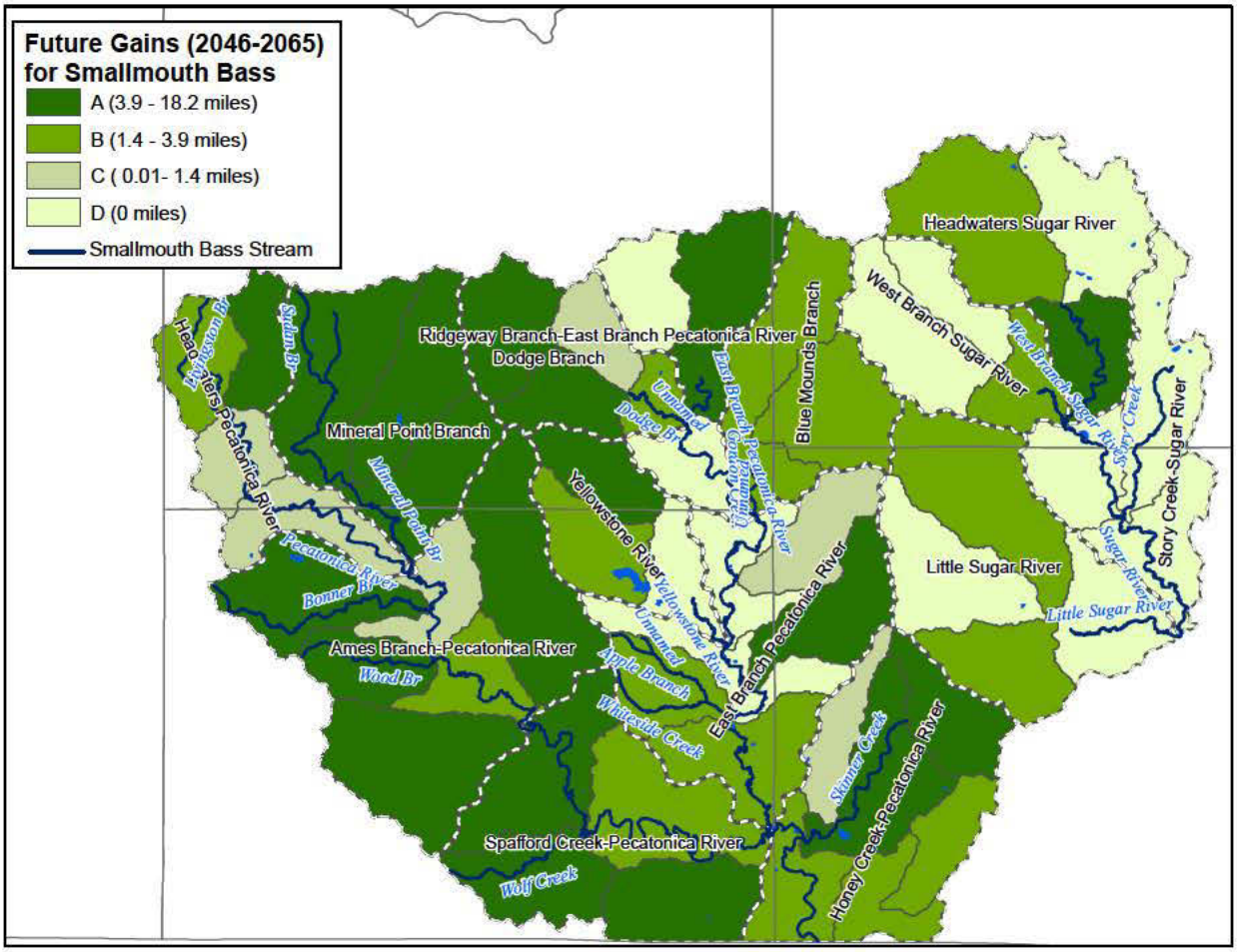


Figure 10.18: Projected future smallmouth bass distribution and resilience in the Pecatonica River Region.



d) Thermal Class

The bar charts at right show the stream miles, by thermal class, of the trout streams in each watershed. Obviously, some watersheds have many more miles of trout streams than others, and not surprisingly nearly all of the existing trout water is classified as either cold or cold transition.

Much of the coldest water in the region is found in southwestern Dane and southeastern Iowa counties and flows into either the East Branch of the Pecatonica or Sugar Rivers.

In the future, most of the existing trout waters in the region are projected to increase in temperature and move one thermal class warmer by 2046-2065 (either from cold to cold transition or from cold transition to warm transition). This change is starkly seen in the differences between the top (future) and bottom (current) bar charts in Figure 10.19. Of note is the nearly total shift from cold to cold transition in the Blue Mounds and East Branch of the Pecatonica River watersheds while the existing cold transition water largely remains so.

The relative stability of future thermal conditions for trout waters in the sub-watersheds is mapped in Figure 10.20. Pockets of the overall region are likely to support water temperatures in existing trout streams similar to today. However, those sub-watersheds that appear to be the most thermally stable are generally also the sub-watersheds with small amounts of existing trout water (e.g., Whiteside Creek, Apple Branch, and Bushnell Creek), which may be influencing the depiction of relative thermal stability.

Figure 10.19: Projected future* and current thermal classes of trout streams in the Pecatonica River Region.

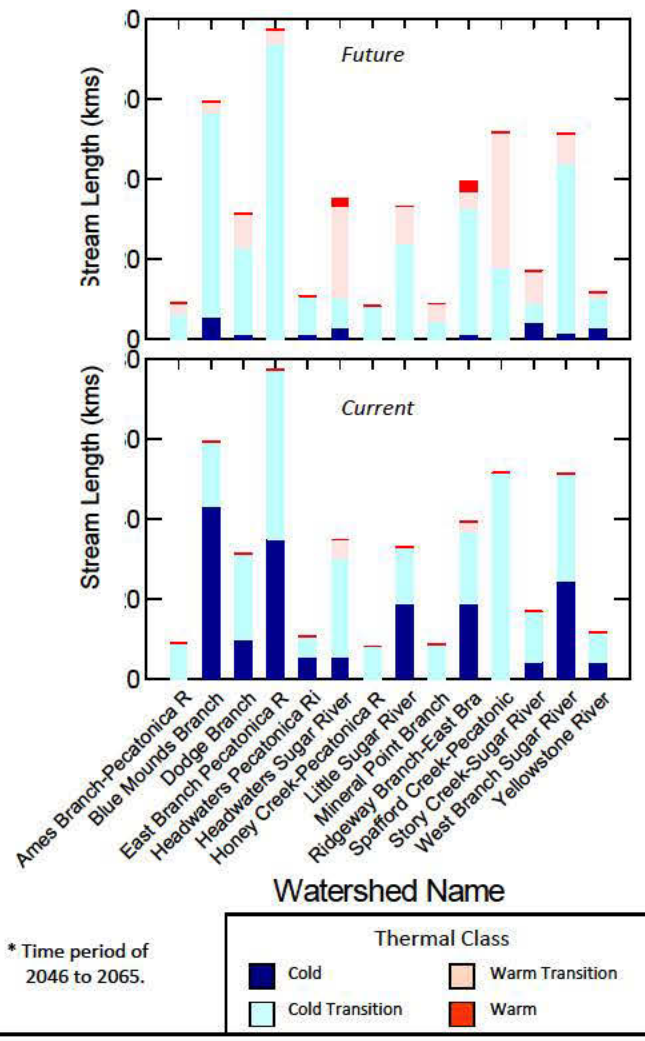
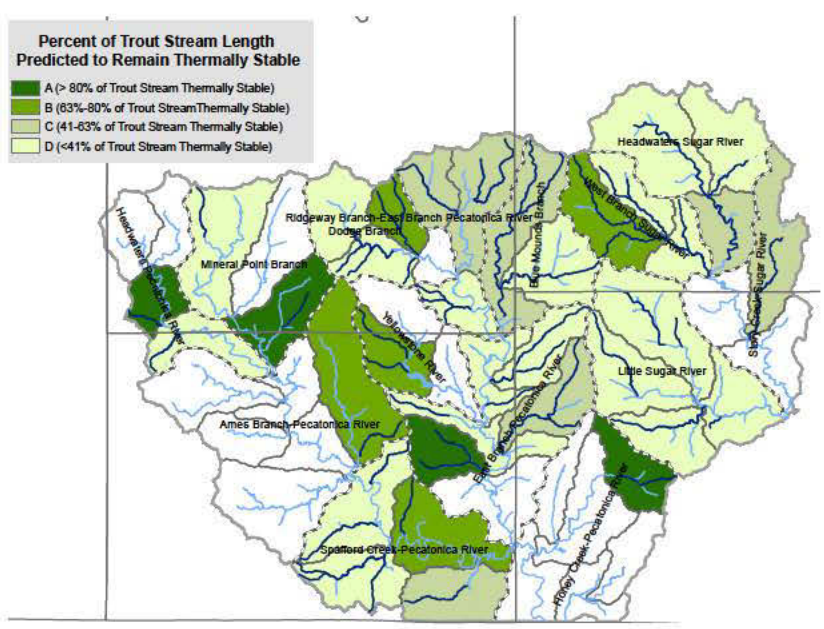


Figure 10.20: Projected changes in trout stream temperatures from current to the time period 2046-2065.



e) Stream restoration

A large amount of in-stream and riparian corridor restoration work has been completed in the West Branch of the Sugar River watershed, specifically in Mt. Vernon Creek, as well as the West Branch itself (Figures 10.21 and 10.22). This work has led to the development of a very high quality fishery and angling experience that is heavily used. In addition, a considerable amount of restoration work has occurred in Gordon Creek (Blue Mounds Branch watershed) along the Dane – Iowa county border. Several more miles of the Gordon Creek, as well as some along Kittleson Valley Creek, have been restored since 2006.

Figure 10.21: Miles of trout habitat work completed from 1970 to 2006 in the Pecatonica River Region.

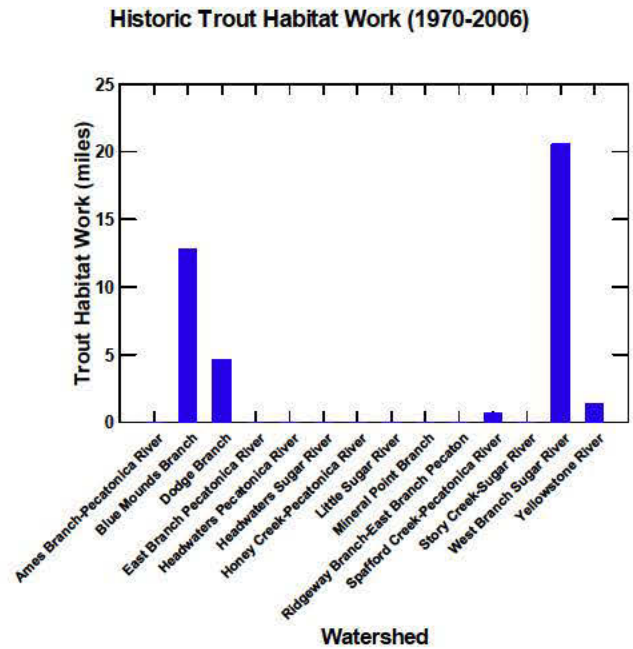
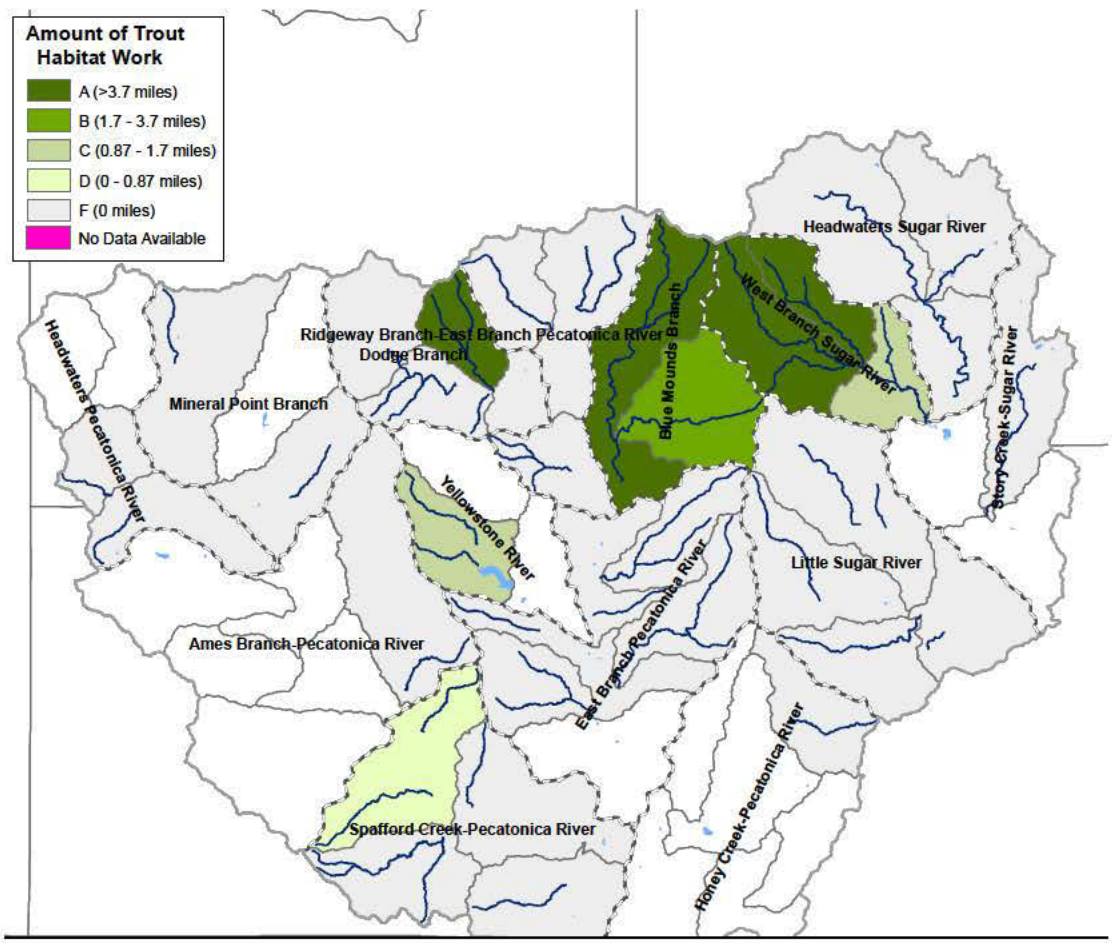


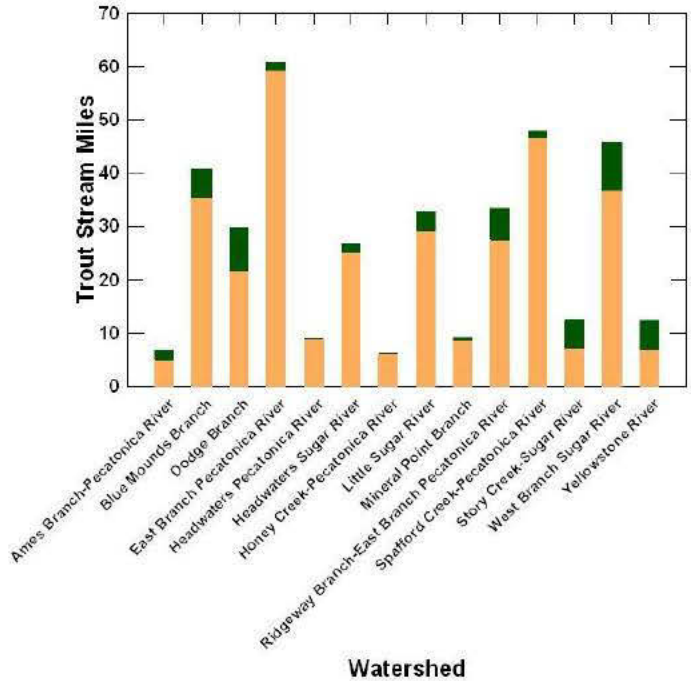
Figure 10.22: Relative amount of trout habitat work completed from 1970 to 2006 in the Pecatonica River Region.



f) Recreation Opportunities

Streams with public shore fishing opportunities tend to be weighted more towards the northern portion of the region (Figures 10.23 and 10.24). Although the Pecatonica River Region harbors some very good smallmouth bass waters, there are considerably more public angling opportunities for trout than smallmouth bass here. Given the region's close proximity to the Madison metropolitan area, many of the public fishing lands here receive heavy fishing pressure.

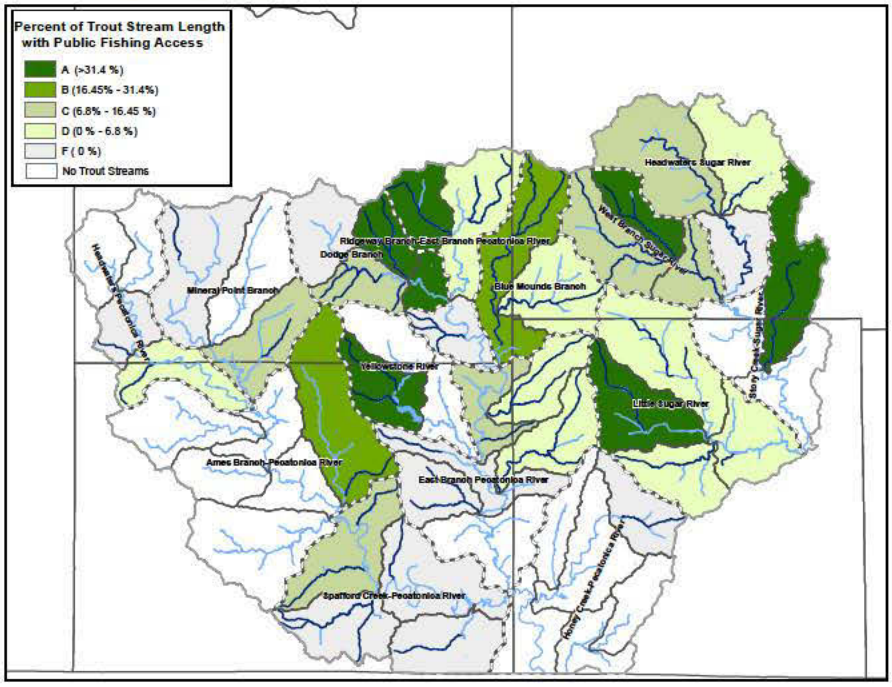
Figure 10.23: Miles of trout streams that are publicly-accessible for angling in the Pecatonica River Region.



i) Trout angling opportunities

The Department owns a substantial number of easements along trout waters in the region. In several sub-watersheds, the DNR owns public access easements along more than 30% of trout waters, a function of both the quality of waters and the Department's efforts to provide readily accessible angling opportunities to the large population centers in southern Wisconsin.

Figure 10.24: Percent of the miles of trout streams in the Pecatonica River Region that are publicly-accessible.



Although not represented on the maps, Dane County holds 20-year and permanent fishing easements along over 7 miles of trout streams in the West Branch of the Sugar River watershed and 6 miles in the Blue Mounds Branch watershed (which includes Gordon Creek and Kittleson Valley Creek). In addition, Donald County Park provides angling opportunities along Fryes Feeder and Deer Creek. Combined with DNR-owned lands and easements, these county easements afford anglers the opportunity to fish along long stretches of trout waters.

ii) Smallmouth bass angling opportunities

The public shore fishing opportunities in the Pecatonica River Region are patchily distributed (Figures 10.25 and 10.26). Several of the watersheds with the most miles of smallmouth bass streams and rivers have little public access (e.g., East Branch Pecatonica River, Spafford Creek-Pecatonica River, and Mineral Point Branch).

iii) Other recreation opportunities

As with much of the rest of the Driftless Area, in addition to fishing, popular recreation activities in the Pecatonica River Region include hunting, wildlife watching, biking and hiking. Camping is very popular at the state and local parks. Most public properties in the region are very well used.

Figure 10.25: Miles of smallmouth bass streams that are publicly-accessible for angling in the Pecatonica River Region.

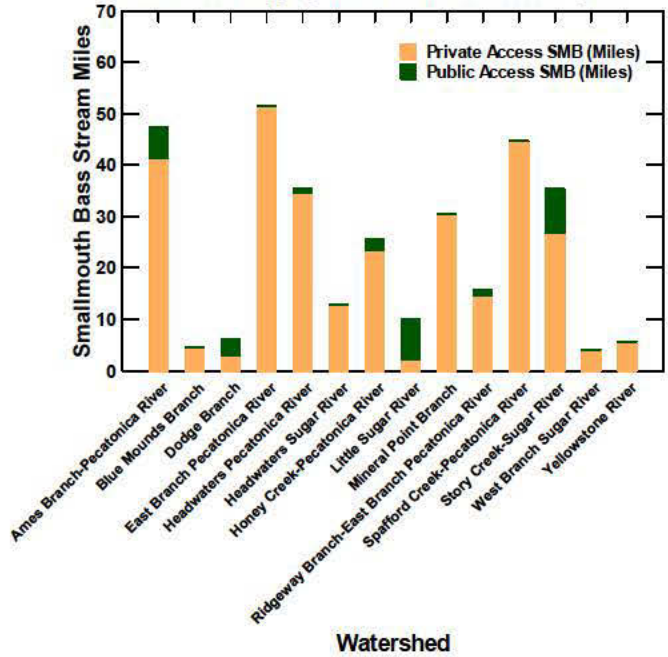
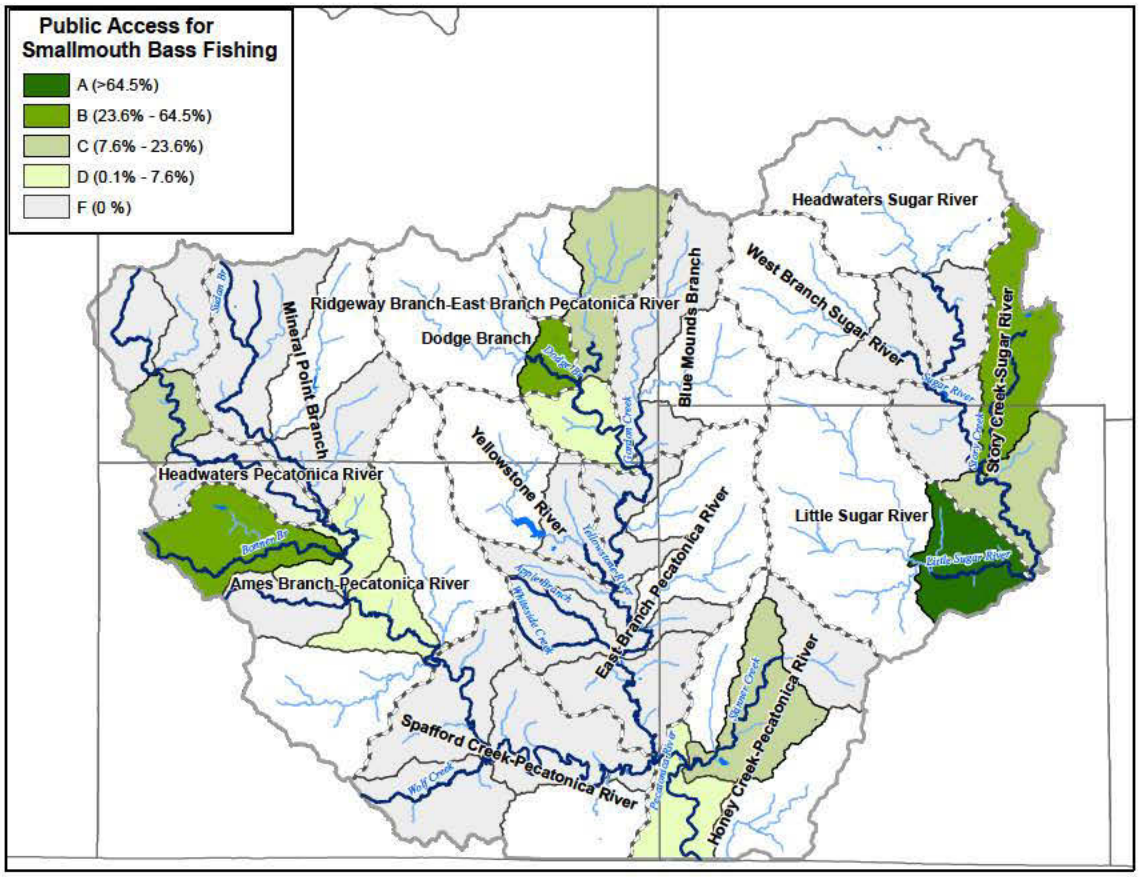


Figure 10.26: Percent of the miles of smallmouth bass stream in the Pecatonica River Region that are publicly-accessible.



iv) Recreation supply and demand

As shown in Figure 10.27, the eastern portion of the region is readily accessible to the large population in the Madison area; not surprisingly these waters receive heavy fishing pressure. Although there are many miles of angling opportunities here (Figure 10.28), because of the large nearby population most sub-watersheds receive only average to below average grades for the relative amount of public shore access (Figure 10.29). That is, the number of publicly-accessible miles of angling opportunity per 100,000 people living within a one-hour drive is relatively low in the northeastern portion of the region, despite the relatively high percentage of trout stream miles that are publicly-accessible (Figure 10.24).

Figure 10.27: Population within a one-hour drive of sub-watersheds in the Pecatonica River Region.

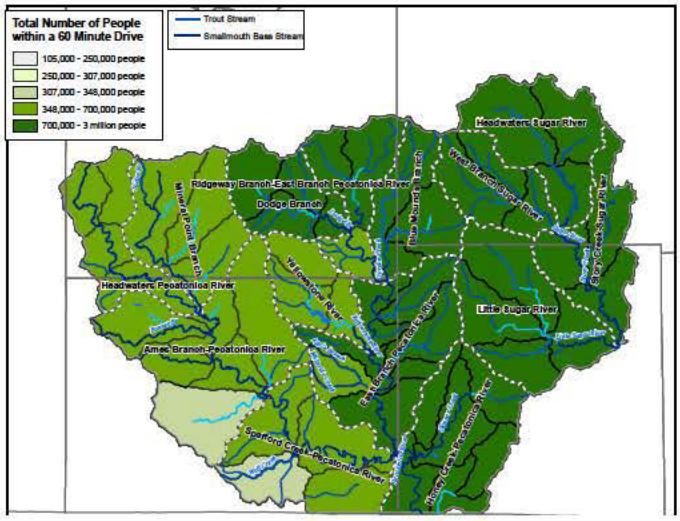


Figure 10.28: Publicly-accessible miles of trout and smallmouth bass streams per 100,000 people within a one-hour drive of watersheds in the Pecatonica River Region.

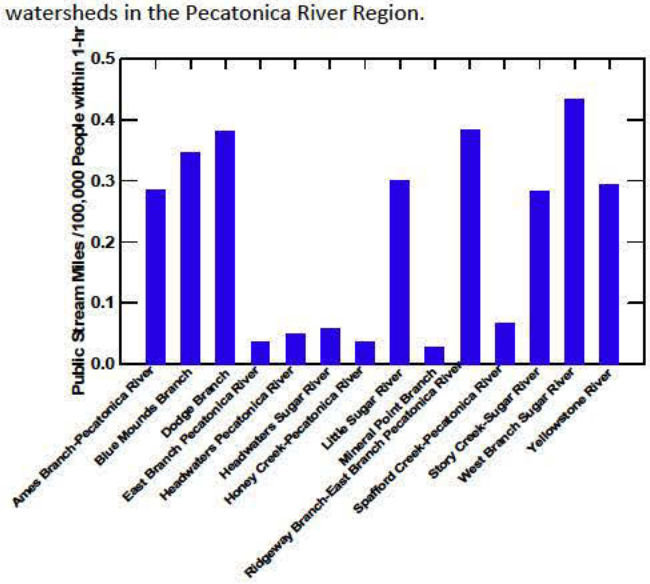
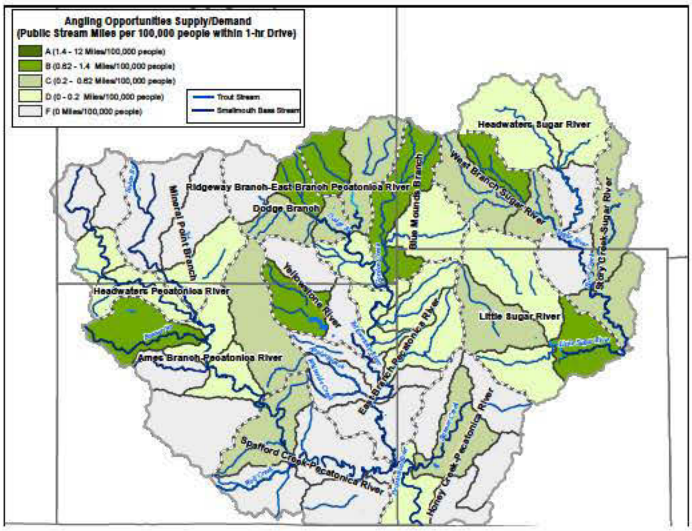


Figure 10.29: Supply of publicly-accessible trout and smallmouth bass stream miles per 100,000 people within a one-hour drive of sub-watersheds in the Pecatonica River Region.



4. The Watersheds

Ames Branch - Pecatonica River

The Ames Branch - Middle Pecatonica River watershed consist of eight main streams: the Ames Branch, Pecatonica River, Otter Creek, Cottage Inn Branch, Bonner Branch, Wood Branch, Gravel Run Creek and Vinegar Creek. These streams are located within a heavy agricultural area. Sediment runoff in conjunction with point and non-point animal waste runoff has resulted in a sport fishery decline in all but one of these streams. It is also important to note that fish kills from human activity have been more common within these waters than others within the Pecatonica River Basin. Poor animal waste management has been the primary cause of many of the kills.

Fishing opportunities consist of smallmouth bass, walleye, channel catfish, flathead catfish, brown trout and northern pike. There is one classified trout stream, Gravel Run Creek, which is a small tributary to Otter Creek. There are approximately 1.5 miles of public fishing easement along the lower stretch of Gravel Run Creek. The Pecatonica River offers the most diverse fishing opportunities. Anglers have available fishable populations of walleye, channel catfish, flathead catfish, and northern pike. There is also a low density population of smallmouth bass supported by the Pecatonica River.

The Ames Branch supports a fishable population of smallmouth bass, but the number of smallmouth bass present has declined. Smallmouth bass are also present in the Wood Branch and Bonner Branch. Similar to the Ames Branch, these two streams once supported a fishable population of smallmouth bass. Currently smallmouth bass are present in these streams but not at a fishable level.

Otter Creek was historically known for its quality smallmouth bass and channel catfish fisheries. After an increase in row crop production in the upper end of the watershed, combined with several animal waste runoff events, this once good fishery no longer supports a fishable population of smallmouth bass or channel catfish. Currently Otter Creek supports a low density smallmouth bass population. There are approximately 7.75 miles of public fishing easements along various portions of Otter Creek.

Blue Mounds Branch

The Blue Mounds Branch watershed, more popularly known as the Gordon Creek watershed, is made up of 10 main streams: Blue Mounds Branch (Gordon Creek), Kittleson Valley Creek, Pleasant Valley Creek, Syftestad Creek, Lee Creek, Jegham Creek, McPeace Creek, Brager Branch, German Valley Creek, and Upper Blue Mounds Branch (Big Spring Creek). Fishing opportunities consist of brown trout and brook trout. Historically smallmouth bass opportunities existed in the lower portions of this watershed, but these waters have evolved into trout fisheries as well.

There are four streams which have all or portions classified as trout water: Blue Mounds Branch (Gordon Creek), Big Spring Creek, German Valley Creek and Kittleson Valley Creek. All streams support a fishable population of brown trout while Big Spring Creek also supports a small brook trout fishery.

Blue Mounds Branch has just over 4 miles of public fishing easement. Kittleson Valley has approximately one mile of public fishing easement. While not part of the State of Wisconsin fisheries lands program, Big Spring Creek, Pleasant Valley Creek, and German Valley Creeks have various public fishing easements obtained by Trout Unlimited and Dane County. There have been approximately 3 miles of tree removal and trout habitat work completed along Blue Mounds Branch (Gordon Creek). German Valley Creek has had just over 1.5 miles

of tree removal and trout habitat work completed. Big Spring Creek has had just over 1.5 miles of tree removal and trout habitat work completed.

Dodge Branch

The Dodge Branch watershed consists of eleven main streams: Dodge Branch, Blotz Branch, Simmons Branch, Lynch Branch, Gribble Branch, Hutchinson Creek, Whitford Creek, Conley-Lewis Creek, Ley Creek, Urnus Creek, and Long Valley Creek. Fishing opportunities consist mainly of brown trout with some brook trout and smallmouth bass available.

There are seven streams in which all or portions are classified trout streams: Conley-Lewis Creek, Ley Creek, Gribble Branch, Whitford Creek, Dodge Branch, and Hutchinson Creek. Conley-Lewis Creek, Ley Creek, Gribble Branch, and Dodge Branch support fishable populations of brown trout. Whitford Creek and Hutchinson Creek support a low density brook trout population. Lynch Branch currently supports both brook and brown trout. Dodge Branch sustains a population of smallmouth bass in the lower reaches as it approaches the East Branch of the Pecatonica River.

Approximately 8,000 feet of tree removal and trout habitat work was completed on the lower portions Ley Creek and 4,600 feet of tree and brush removal were completed on two segments of Conley-Lewis Creek. Ley Creek has just over 2 miles of public fishing easement with approximately 500 feet of protective streambank easement. Conley-Lewis has just over 4 miles of public fishing easement along with several hundred feet of protective streambank easement in the upper reaches.

East Branch Pecatonica River

The lower portion of the East Branch of the Pecatonica River watershed consists of 10 main streams: East Branch of the Pecatonica River, Cherry Branch, Whiteside Creek, Apple Branch, Trotter Branch, Braezels Branch, Dougherty Creek, Mud Branch, Brennan Creek, Sawmill Creek, and Erickson Creek. Fishing opportunities consist of brown trout, walleye, northern pike, channel catfish and flathead catfish. There are seven classified trout waters: Whiteside Creek, Apple Branch, Mud Branch, Brennan Creek, Sawmill Creek, Dougherty Creek, and Erickson Creek. All of these streams support a low to moderate density brown trout fishery.

Brennan Creek has just over 0.5 miles of public fishing easement and 0.75 miles of streambank protective easement on a coldwater tributary. Dougherty Creek has just over 0.5 miles and Erickson Creek has 0.3 miles of public fishing easement.

The East Branch of the Pecatonica River supports fisheries of walleye, channel catfish, flathead catfish, and northern pike. There are also largemouth bass smallmouth bass and panfish present, but not in fishable numbers.

Headwaters Pecatonica River

The Headwaters Pecatonica River watershed consists of four main streams: the Pecatonica River, Livingston Branch, Williams-Rewey Branch, and Jones Branch. Fishing opportunities consist of brook trout, brown trout, smallmouth bass, walleye, and channel catfish. There is no public access located within this watershed. There are two classified trout streams, Jones Branch and Williams-Rewey Branch. Both sustain low density trout populations. The Jones Branch supports a limited brown trout fishery; Williams-Rewey supports a low density population of both brook trout and brown trout.

The Pecatonica River sustains populations of smallmouth bass, walleye, and channel catfish. All three species are present in low numbers. Seasonal fishing opportunities exist for walleye and channels catfish. Smallmouth bass numbers are low enough that a fishable population does not exist.

Headwaters Sugar River

The Upper Sugar River was reclassified to a Class II trout fishery in 2006 following changes in the fish community resulting from land use changes in the watershed. The Upper Sugar is a low density resource but is atypical in the representation of larger fish. Most access is from town road crossings and fishing areas are a mix of public and private parcels. A considerable portion of the stream lies within State Natural Areas and is bordered by an adjacent bicycle trail. The stream thread runs through expansive wetlands and combines opportunities for wildlife observation and nature appreciation along with fishing.

Honey Creek - Pecatonica River

The Honey Creek watershed is characterized by coolwater-coldwater and coolwater-warmwater transitional streams. These are generally small in size and have small gradients. These waterbodies lie within a landscape that has been dominated by intensive agriculture for over a century. Stream threads are typically perturbed by sedimentation, channelization, livestock impacts, and general loss of habitat diversity. Limited public access opportunities exist. The few sport fishing opportunities are modest and typically maintained through stocking.

Little Sugar River

The Little Sugar River is a modest brown trout fishery in Sections 4, 10, 14 and 23 of T4N, R7E, New Glarus Township. Habitat work was conducted in limited sections in 2009 and 2010 and is scheduled for continuation in 2013. Traditional bank stabilization techniques and small scale in- stream habitat features such as Vortex weirs and barbs have been installed. The lower portion of the stream lies within a drainage district and the physical habitat is limited by channel straightening and encroachment of invasive woody vegetation. Public access is limited to road crossings.

Mineral Point Branch

The Mineral Point Branch watershed consists of seven main streams: the Mineral Point Branch, Sudan Branch, Rock Branch, Furnace Creek, Brewery Creek, Laxey Creek, and Peddler Creek. Fishing opportunities consist of brown trout, smallmouth bass, walleye, and channel catfish. Approximately 2,100 feet of public fishing easement is available along a single stretch of the Rock Branch. There are two classified trout streams, Sudan Branch and Rock Branch. The Sudan Branch sustains a low density brown trout population. The Rock Branch sustains a moderate density brown trout population which is considered fishable. Trout habitat work has been completed along the entire reach of the Rock Branch public fishery area.

The Mineral Point Branch and Sudan Branch both sustain populations of smallmouth bass, walleye, and channel catfish. The Mineral Point supports a fishable population of smallmouth bass but does not currently have any public access. As with many of the smaller streams in this area, seasonal fishing opportunities exist for walleye and channel catfish in both the Sudan Branch and Mineral Point Branch.

Ridgeway Branch - East Branch Pecatonica River

The Ridgeway Branch - East Branch of the Pecatonica River watershed consists of six main streams: the East Branch of the Pecatonica River, Smith-Conley Creek, Schmidt Creek, Olson Creek, Regan Creek, and Williams-Barneveld Creek. Fishing opportunities consist of brown trout, brook trout, smallmouth bass, walleye, and

channel catfish. All six streams within this watershed have all or portions classified as trout water. All offer fishable brown trout populations with Olson and Regan having a low density brook trout population as well.

Approximately 4,000 feet of tree removal and trout habitat work was completed on the middle portion of Smith-Conley Creek. Four thousand feet of a floodplain restoration project was completed on the upper end of the East Branch of the Pecatonica River and a 3,000 foot floodplain restoration project was completed on the upper portion of Williams Barneveld Creek. Smith-Conley Creek has approximately 5 miles of public fishing easement along with 1 mile of protective streambank easement on spring tributaries.

The lower portions of this watershed have fishing opportunities for smallmouth bass, channel catfish, and walleye. There is a dam at Blanchardville on the East Branch of the Pecatonica River which prevents upstream fish movement.

Spafford Creek - Pecatonica River

The Spafford Creek / Lower Pecatonica River watershed consists of eleven main streams: the Pecatonica River, Spafford Creek, Turtle Creek, Feather Branch, Thunder Branch, Brown Branch, Trout Brook (Slawther), Wolf Creek, Copper Creek, Lovett Creek, Silver and Spring Creek. Fishing opportunities consist of brown trout, smallmouth bass, walleye, channel catfish, flathead catfish, and northern pike.

There are six classified trout streams: Brown Branch, Trout Brook (aka Slawther), Wolf Creek, Copper Creek, Lovett Creek, and Silver Spring Creek. Brown Branch and Silver Springs Creek support low density brown trout populations. Trout Brook, Wolf Creek, Copper Creek, and Lovett Creek support moderate populations of brown trout. Lovett Creek has 1.2 miles of public fishing easement. Approximately ½ mile of bank sloping and rip-rap has been completed on the lower portions of the Lovett Creek Fishery Area. There are approximately 0.5 miles of streambank or public fishing easements along spring tributaries to Lovett Creek.

Beyond the trout streams other fishing opportunities are located in the lower portions of Spafford Creek and all portions of the Pecatonica River. Spafford Creek supports seasonal channel catfish and northern pike fisheries. The Pecatonica River supports fishable populations of walleye, channel catfish, flathead catfish, and northern pike.

Story Creek - Sugar River

Story Creek runs through the Brooklyn Wildlife Area and is the least developed of trout waters in Dane County. Its remote character makes it difficult to access, however, that secluded nature contributes to a high quality natural trout resource that includes many large fish. Stream banks are typically brushy, often necessitating fishing from within the stream itself. Beaver presence is problematic and the stream regularly re-routes itself around dams and blockages. Brook trout numbers are good and natural reproduction is evident. However, size structure is modest. Aesthetically, Story Creek rates as a unique property typified by solitude and quiet.

West Branch Sugar River

In the late 1990s, the West Branch Sugar River was the site of the first targeted runoff management project which married bank stabilization work with in-stream habitat restoration and development. Cooperating landowners voluntarily traded 20 year public access easements in return for work that cleared trees and revived channels. Trout response has been impressive and the WSBR now enjoys natural reproduction and hosts plentiful fish and quality size structure. Anglers can enjoy a prairie type landscape within a contiguous 9+ mile thread of public access. The WSBR experienced a significant manure related fish kill in 2005 but has recovered completely as of 2012.

Yellowstone River

The Yellowstone River watershed consists of four main streams: Yellowstone River, Steiner Branch, Canon Branch and McClintock Creek. Fishing opportunities consist of smallmouth bass, brown trout, brook trout, panfish, walleye, musky, and channel catfish. There are 2 streams classified as trout water, Steiner Branch and Canon Branch. The Canon Branch supports a limited brown trout fishery and the Steiner Branch supports a quality brook trout fishery that is still improving.

Canon Branch has just over 1 mile of public fishing easement. Just over 3 miles of the Steiner Branch are located within the Yellowstone Lake property. There has been 1.5 miles of tree removal and trout habitat improvements on the Steiner Branch.

The Yellowstone River was dammed in 1954 to create Yellowstone Lake. The Yellowstone River supports a fishable population of smallmouth bass upstream of Yellowstone Lake. There are also seasonal fishing opportunities for walleye and channel catfish upstream of the lake. Downstream of the lake, seasonal opportunities exist for walleye and musky. Year round opportunities exist for channel catfish, crappies, and bluegill. Fisheries located downstream of the lake are created by escapement of fish from Yellowstone Lake. There are approximately 1.5 miles of the Yellowstone River located within the Yellowstone Lake Wildlife area and Yellowstone Lake State Park.