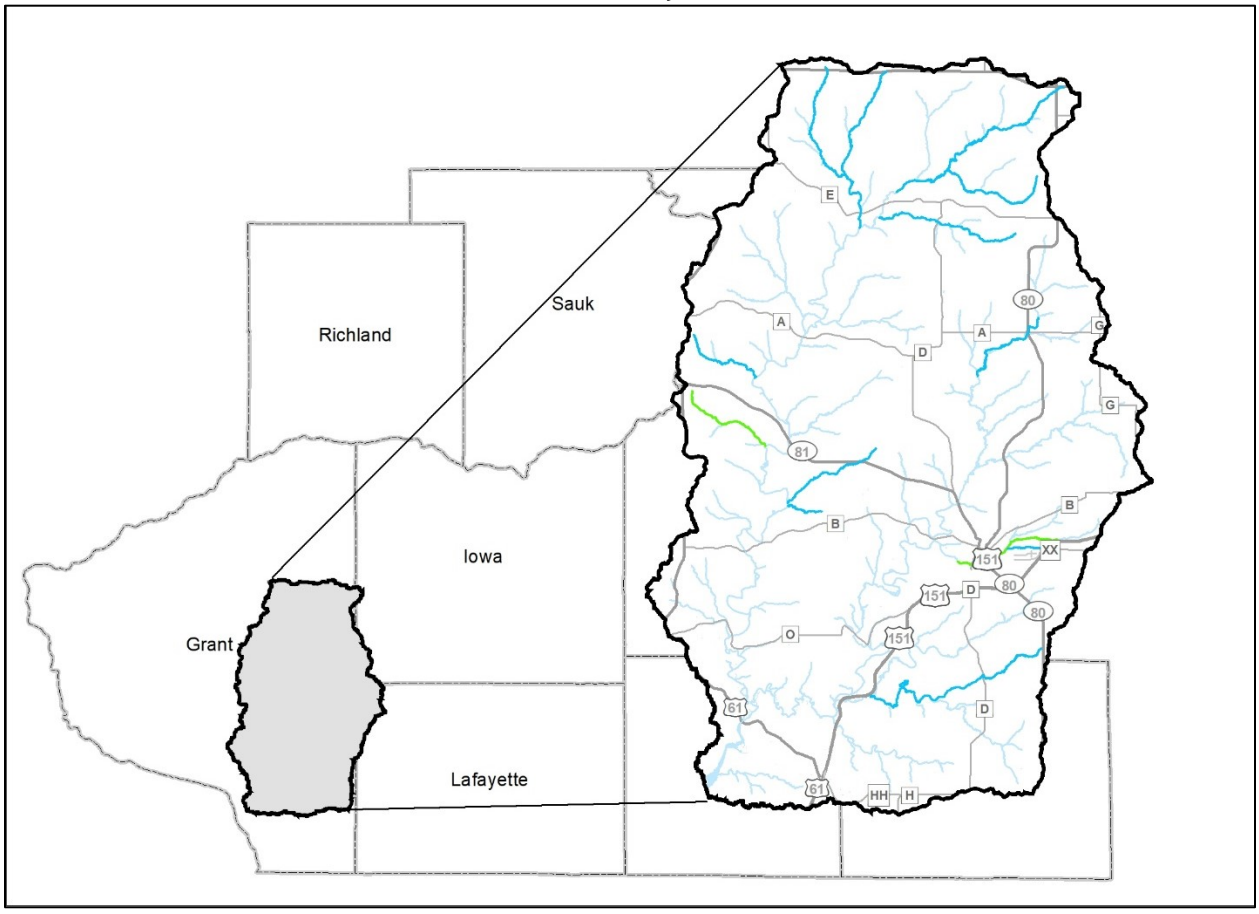
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

# Trout Management and Status Report of the Platte and Little Platte River Watersheds

Grant County, 2021




**Timothy Parks**
DNR Fisheries Biologist
**Daniel Walchak**
DNR Fisheries Technician Advanced
Dodgeville, Wisconsin
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# Executive Summary

In 2021, wadeable fish and habitat surveys were performed to assess the status and management of trout streams in the Platte River and Little Platte River Watersheds. Specifically, the purpose of this assessment was to determine the trout population status (natural reproduction, recruitment, adult population size), fish habitat and biotic integrity in classified trout streams. The results from this survey will help to update the current trout management in this watershed. These adjustments include recommended changes to 1) trout stream classification, 2) stocking practices, 3) habitat improvement and protection and 4) fishing regulations.

All 13 classified trout streams assessed contained brown trout populations. Age diversity of these populations varied considerably among streams. Brown trout natural reproduction occurred in 92% of streams in both watersheds. All of these streams showed Age-0 catch per unit effort (CPUE) > 40.2 fish/mile, which exceeded the 25$^{th}$ percentile benchmark (considered fair or better) for natural reproduction in Class I trout streams of Driftless Area. Age-1 brown trout occurred in 92% of streams; 69% of streams exceeded the 25$^{th}$ percentile for recruitment (CPUE ≥ 82.6 fish/mile). Adult brown trout were found in 92% of streams; 54% of these streams exceeded the 25$^{th}$ percentile for adult abundance (CPUE ≥ 128.7 fish/mile). Preferred size brown trout (≥12 inches) were found in 62% of streams; 46% of streams exceeded the 25$^{th}$ percentile for abundance of these larger fish.

Surveys were performed in eleven unclassified streams and trout were collected in all of them. Nine streams contained trout populations with at least two age-classes represented. In the Little Platte River Watershed, these included an unnamed tributary (UNT) to Rountree Branch (WBIC 946100), the UNT to Little Platte River (WBIC 5040500) and unclassified reaches of Rountree Branch and Little Platte River. In the Platte River Watershed, these included Bacon Branch, Bull Branch, Willow Branch, the unnamed tributary to the Platte River (WBIC 954900) and the middle reaches of the Platte River. Most of these populations were brown trout except for one brook trout population in the UNT to the Little Platte River (WBIC 5040505), which was recently reestablished through stocking. Most notably, the unclassified portions of the middle Platte River contained a significant brown trout population.

Coldwater index of biotic integrity (IBI) scores provided some insight into habitat conditions and water quality in classified trout streams. Overall, IBI scores were generally “poor” in the trout streams of the Platte River (mean IBI = 20.6; range = 3.3-40.0) and Little Platte River Watersheds (mean IBI = 21.7; range = 10.0-33.3). Regardless of this overall rating, not all streams exhibited poor IBI scores; 34% of stream reaches were considered “fair” or better. Stream reaches with higher IBI scores typically contained a greater abundance of brown trout and lower abundance of fish species tolerant to environmental degradation.

Habitat conditions were generally suitable for trout in the Platte and Little Platte River Watersheds. Based on qualitative fish habitat scores, overall habitat in classified trout streams was considered "Good" in both the Platte River Watershed (mean = 58.6; range = 43.0-73.0) and Little Platte River Watershed (mean = 57.6; range = 46.6-70.0). In 85% of surveyed stream reaches, normal or above-normal summer streamflow was observed, indicating that most streams contained a sufficient habitat volume. At least 85% of stream reaches had measured water temperatures below the threshold (<69.3°F) for typical coldwater stream habitats in Wisconsin.

The results from this assessment highlighted how naturally productive brown trout populations have become in the Platte and Little Platte River watersheds. At least 7 of 11 existing Class II streams in these watersheds now exhibit self-sustaining population characteristics. As a result, these streams should be reclassified as Class I trout water and stocking should be discontinued. In addition to this, at least three potential streams should receive new trout classifications, including two streams expanding their current trout classification. Although habitat was generally suitable for trout in most designated trout waters, many habitat issues were still prevalent in these streams. Habitat improvements and conservation best management practices should be considered for many streams to maintain productive capacity of these streams. Many streams also would benefit from acquisition of additional streambank easements to protect streams and provide additional access opportunities. Updates to special fishing regulations and one new stocking quotas should be implemented to bolster fish populations while providing new fishing opportunities.

**MANAGEMENT RECOMMENDATIONS**

- Goal: Maintain fishable abundances of adult brown trout
- Goal: Increase brown trout natural recruitment
- Reclassify the following streams from Class II to Class I trout water: Austin Branch, Culver Branch, Lee Branch, Leggett Creek, Martinville Creek and Little Platte River.
- Expand Class I trout water in Rountree Branch and the Class II trout water in Platte River.
- Classify Willow Branch as Class II trout water.
- Discontinue brown trout stocking in all proposed Class I streams.
- Discontinue brown trout stocking in Crow Branch.
- Develop brown trout stocking quota for Snowden Branch.
- Change the Little Platte River catch and release regulation to the county base regulation (3-fish daily bag with an 8-inch minimum length limit), to simplify the fishing regulations and provide harvest opportunities.
- Implement a 12-inch minimum length limit with 2-fish daily bag limit on the Platte River to increase adult abundance and size structure.
- Incorporate water temperature monitoring into the next rotational assessment.
- Evaluate contribution of stocked brown trout in the Platte River.

- Propose streambank easement eligibility in the Platte River Watershed.
- Perform SBE outreach to riparian landowners in the Platte River Watershed.

## WATERSHED LOCATION

The Platte River and Little Platte River Watersheds are located in the Southwest corner of Grant County.

- Platte River Watershed (10-digit hydrologic unit code (HUC10): 0706000305) drains into the Mississippi River at 42.61251°, -90.66472° (Latitude/Longitude)
- Little Platte River Watershed (HUC10: 0706000304) drains into the Platte River at 42.64620°, -90.63995°

## PURPOSE OF SURVEY

- Assess current status of trout populations:
    - Natural reproduction and recruitment
    - Adult population size
    - New trout populations
- Assess current status of fish habitat and biotic integrity
- Update trout management regime:
    - Trout classification
    - Stocking practices
    - Fishing regulations
    - Habitat improvement and protection actions

## DATES OF FIELDWORK

June 2021 to September 2021

## SPECIES SAMPLED

- American brook lamprey
- Banded darter
- Bigmouth shiner
- Bluegill
- Bluntnose minnow
- Brassy minnow
- Brook silverside
- Brook stickleback
- Brook trout
- Brown trout
- Central stoneroller
- Channel catfish
- Common shiner
- Creek chub
- Emerald shiner

- Fantail darter
- Fathead minnow
- Gizzard shad
- Golden redhorse
- Green sunfish
- Hornyhead chub
- Johnny darter
- Largemouth bass
- Logperch
- Longnose dace
- Mississippi silvery minnow
- Northern hogsucker
- Ozark minnow
- Pumpkinseed
- Rosyface/carmine shiner
- Sand shiner
- Shorthead redhorse
- Smallmouth bass
- Southern redbelly dace
- Spotfin shiner
- Stonecat
- Western blacknose dace
- White sucker

# Introduction

The Platte River Basin is comprised of the Platte River and Little Platte River watersheds which drains a combined 332 square mile area into the Mississippi River in southwestern Grant County, Wisconsin. Compared to other mainstem drainage streams in Grant County, the longitudinal profiles of the Platte River and Little Platte River exhibit the greatest change in vertical elevation (Smith and Ball 1972). These two watersheds are situated in the southern Driftless Area ecoregion and straddle the Western Coulee & Ridges and the Southwest Savanah ecological landscapes (DNR 2015). These driftless landscapes are known for their unglaciated physical features reflecting a diverse topography (e.g., bluffs, outcroppings, ridgetops), dendritic drainage networks, permeable carbonate and sandstone bedrock geology, abundant springs and spring-fed streams. Specifically, there are 688 documented springs in the Platte River and Little Platte River Watersheds (Macholl 2007). Both springs and other groundwater seepage in this area plays a crucial role in sustaining baseflows and regulating water temperatures in trout streams. Without these unique spring and ground seepage features, trout streams would probably not exist in the Platte and Little Platte River Watersheds.

The spring-fed streams of the Little Platte and Platte River Basins contain brown trout populations that support several notable fisheries. Historically, brook trout likely occurred throughout headwater streams in these watersheds until their demise following the landscape transformation in the 1800s (DNR 2013). Brook trout were reintroduced on the landscape and brown trout were introduced as well to create additional fishing opportunities. Interestingly, only brown trout were able to establish in streams within the Platte and the Little Platte River Watersheds (Table 1; Figure 1). The trout water on the landscape represents a spectrum of different brown trout populations sustained either via natural reproduction or a combination of natural reproduction and stocking. Trout anglers tend to frequent several locally popular streams, including Martinville Creek, Crow Branch, McPherson Branch, Rountree Branch and Little Platte River. Other streams receive less angler attention, yet still offer ample trout angling opportunities, including the Platte River, Leggett Creek, Snowden Branch and Austin Branch. In some unclassified waters known for smallmouth bass (e.g., middle Platte River, Bull Branch), anglers often report notable catches of larger brown trout. These recent reports of brown trout occupying streams more suited for smallmouth bass offers encouraging insight into the potential changes in cold and coolwater habitat on the landscape.

Although the prevalence of picturesque water resources implies good habitat quality in these watersheds, many of these streams experienced a history of land use disturbance. Historically, the most common impacts have come from agriculture, mining, waterway manipulation (e.g., wetland filling, channelization), timber harvest and other land development. Agriculture, in particular, has been the most widespread stressor to stream habitats in Southwestern Wisconsin. Poor agricultural practices in the past have resulted in drastic changes to the natural flow regimes, water quality and habitat characteristics in streams (e.g., channel and valley form, substrate composition, bank stability; Knox 1977, Vondracek 2019). This was most notable during the mid- to late-1800s when farmers cultivated hillsides, which led to erosion events that transported sediment to streams and floodplains. In the Platte River, eroded soils from hillsides were deposited in floodplains and increased bank height as much as 13 feet. This entrenchment of the Platte River disconnected the floodplain from the channel throughout 80% of its length (Knox 1977).

Nowadays, the majority of agricultural impacts come from nonpoint source runoff and various forms of erosion (e.g., cropland, barnyard, pasture-related streambank erosion), which degrade both water quality and habitat. Many streams throughout the Platte and Little Platte River Watersheds have been listed for impairments related to nonpoint source runoff and sedimentation problems. In some instances, impairments have been so bad that several of these streams (e.g., Martinville Creek and Snowden Branch) had Total Maximum Daily Load (TMDL) plans developed to work with riparian landowners to attempt to fix these land use issues (DNR 2006, 2007). Fortunately, enhanced agricultural practices (e.g., rotational grazing, cover crops) have been more commonly employed as well as modern conservation practices (e.g.,

riparian buffer strips) to lessen the potential impacts from agriculture, yet many streams still exhibit signs of historic land use disturbances.

Regardless of these impacts, the stream habitats of the Platte and Little Platte River Watersheds have shown signs of improvement and increased fishery potential over time. In the Platte River, hydrologists have identified increasing baseflows (Gebert et al. 2011) and decreased peak flows from flood events (Gebert et al. 2016). These long-term changes in streamflow characteristics indicate that land use practices have likely improved over time and allowed for greater groundwater recharge. This means more cold- and coolwater habitat availability and greater trout population carrying capacity, as seen in other trout populations throughout the Driftless Area (Olson et al. 2021; Olson 2022). Additionally, recent analyses have identified streams within the Platte River Watershed as having considerable habitat potential and resilience to climate change for brown trout (DNR 2013). Many natural brown trout populations still persist in Platte and Little Platte Watersheds and their persistence can be attributed to improved land use, public land protections (i.e., public stream bank easements or fee title land acquisition), greater natural landcover, increased groundwater recharge, stream habitat improvements and use of conservation practices on the landscape. To really understand how trout populations have improved as a result of these improvements, it is ultimately necessary to assess the current status of these trout streams.

## STOCKING

Similar to other Driftless Area streams, the trout streams of the Platte and Little Platte River Watersheds have a long history of trout stocking. Currently, “put and grow” stocking practices are used to maintain brown trout abundance in populations with insufficient natural reproduction and recruitment. The DNR stocks small and large fingerling brown trout based on their effectiveness and utility in each individual stream. In these watersheds, small fingerlings have appeared to be more effective since they tend to survive better in streams showing signs of some natural reproduction. Though brown trout are the primary focus in these streams, we have stocked rainbow trout and brook trout in the past to create additional angling opportunities, but little success occurred for these species. Brook trout are still stocked for restoration purposes in this area, but only on a limited basis where habitat is suitable for brook trout.

Prior to this assessment, seven Class II trout streams had been stocked in these watersheds (Tables 1 and 2). Brown trout stocking occurred in the upper Platte River, Culver Branch, Austin Branch, Leggett Creek, Crow Branch, Martinville Creek, and the Little Platte River. Many of the small fingerling brown trout quotas in both watersheds were doubled in 2020 due to surplus fish availability from the hatchery system. Only one stream was stocked the year prior and during this assessment. The unnamed tributary (WBIC 5040505) to the Little Platte River received brook trout large fingerling stockings from 2019-2020 to establish a population.

## REGULATIONS

The county-wide 8-inch minimum length limit with a 3-trout daily bag limit is the primary trout fishing regulation that applies to nearly all of the trout streams in the Platte and Little Platter River Basin during the regular fishing season (Figure 2; Table 1). This county-wide base regulation pertains to any trout fishing happening in either classified or unclassified trout streams. The only special regulation is on the Little Platte River, upstream of Waterfall Road to State Highway (STH) 80. All trout caught on this reach must be immediately released and gear is restricted to using artificial lures only. This special regulation was first implemented in 1990 to maintain brown trout abundance on waters with public access, which was more limited at that time.

## HABITAT IMPROVEMENT

Past stream habitat improvement in these watersheds was implemented to address a variety of habitat issues. Many of these projects included improvements aimed at mitigating issues related to bank stability, channel grade control, riffle-pool-run restoration, erosion control, sedimentation and maintaining/improving longitudinal connectivity at road-stream crossings (WDNR unpublished data, Surface Water Data Viewer; Hanson 2019). The long-term effects and durability of these habitat projects vary considerably depending on the project and implementation. In the Platte River Basin, several reaches of the McPherson Branch near Hudson Hollow Road had riprap, flow deflectors and vortex weirs installed. At the same site, brushing treatments were also performed. The McPherson Branch project occurred during 2001-2002 and was funded through Trout Stamp funds and Trout Unlimited (Nohr Chapter) contributions. In the Little Platte River Basin, bank-sloping was implemented in the Little Platte River in 2009-2010, followed by the installation of vortex weirs, instream boulders and riprap.

Beyond the fish habitat improvement projects, the majority of waterway protection projects implemented in these watersheds involved bank stabilization. This is commonly done either through rip-rap projects or via integrated bank stabilization projects, which incorporate bank-sloping and methods beyond the use of riprap alone. Historically, the majority of the bank stabilization projects have mainly utilized riprap bank armoring techniques. Integrated bank stabilization projects have used more often in recent years to try to remedy problems with entrenched streams. Bank-sloping using a 3:1 slope or shallower has allowed streams to naturally reconnect with their floodplains and lessen the impacts of high flows. In the past, riprap projects were designed to fully armor the bank, which restricts horizontal channel migration and potentially increase flood power. When used by itself for bank armoring without integrating bank-sloping, riprap probably limits the long-term net benefits to trout habitat. Given the damage to habitat projects during recent flooding events in the driftless area over the last 10-20 years, it is not practical to install fish habitat structures in entrenched streams with riprap alone. Fortunately, the recent

stream improvements in the watershed include integrated bank-sloping practices, which will much more resilient over time.

## PUBLIC ACCESS

Public fishing access is somewhat limited in the Platte and Little Platte River Watershed. The most common way to publicly access streams is via bridges or culverts on public roads where road right-of-way exists. State-owned streambank easements are also available on McPherson Branch, Little Platte River and the Snowden Branch (Figure 3). DNR State Habitat Area (fee-title property) is also available near the spring entering in Little Platte River near Arthur. There are also several tracts of public land in Platteville surrounding the Rountree Branch, which are maintained by the city, the University of Wisconsin-Platteville and the DNR. Beyond the public access to trout water, streambank easements have been acquired on the segments of the Little Platte River and Platte River. Most of these easement eligible streams are located throughout Little Platte River Watershed and in the lower portions of the Platte River Watershed. These streams primarily consist of smallmouth bass water, but it also includes some classified trout water.

## LAND USE

Watershed land use (i.e., land cover) is fairly similar in both the Platte and Little Platte River Watersheds. The only difference is that the Platte River Basin has greater proportions of natural land cover (Table 3; Stroud 2021). Currently, natural land cover comprises 13-22% of these watersheds, which is primarily composed of forested land cover (12-21% of the watersheds) and to a lesser extent grassland (0.1% in both watersheds). The most prevalent land cover in these basins is agriculture (73-79% of basins), reflecting a combination of row crop agriculture and pasture/hay production. Developed and barren land cover makes up 5-8% of these watersheds (Table 2) which reflects impervious land use.

## WATERSHED SCALE ASSESSMENT AND TROUT CLASSIFICATION

Understanding reproduction and recruitment is critical to managing trout populations. In Class I streams as defined in NR 1.02 there is no need for stocking because there is sufficient natural reproduction to maintain the fishery. In streams where there is insufficient natural reproduction and recruitment to maintain a fishable adult population (i.e., an adult trout relative abundance > 50 fish/mile), the Department may stock fingerling trout. These are designated as Class II streams and the stocking in these streams is often referred to as “put and grow” stocking. Based on the life history of trout, natural reproduction and age-0 rearing habitats often occurs in different stream segments and other habitat types than are used by age-1 and adult fish. Class I streams can include habitat where all age-classes and life history events occur. In these assessments natural recruitment is defined by the amount of age-1 fish reflecting the juvenile fish surviving to age 1. Natural reproduction is defined by the presence and amount of age-0 fish, which may be more variable (due to their electrofishing catchability). Natural reproduction may

occur upstream in nursery habitats and age-0 fish may later migrate downstream to adult and juvenile habitats. Documenting the lack of natural reproduction (young of the year trout) does not mean there is lack of natural recruitment. To assess natural reproduction and recruitment, all stocking of fingerling trout was suspended the year prior to these surveys. The assumption is that all yearling (age-1) trout captured were from natural recruitment somewhere in the watershed and all Young of the Year (age-0) trout were from natural reproduction. Age-2 and older fish may be from mixed sources if previous stocking occurred. If there is an absence or low abundance of age-1 trout but an abundance of adult trout, the stream should be classified as Class II.

Whether trout streams and their associated populations are connected or isolated, rotational watershed trout assessments are performed periodically to determine the status of trout populations in all classified trout streams and other connected coldwater streams exhibiting trout potential. A trout can move throughout the connected streams within a watershed and utilize various suitable habitats throughout their life (Fausch et al. 2002; Dieterman and Mitro 2019). This means assessment and management of a single trout population at the stream-scale is often not practical and scaling up to a watershed level can help better assess connected trout populations. The purpose of these watershed assessments is to 1) assess trout population status via natural reproduction/recruitment dynamics and adult population characteristics, 2) evaluate the biological integrity of trout streams and 3) assess the status of fish habitat.

# Methods

## SURVEY DESIGN

These assessments were designed to assess trout streams and potential trout streams within one or more adjacent watersheds (i.e., a trout management planning group) on a 6-year rotation. This process is used to cover all designated trout water in Southwest Wisconsin. Within each planning group, survey stations (sites) were allocated based on the length of classified trout streams to adequately characterize all trout populations and habitat. This watershed-based assessment approach is cost-effective and biologically meaningful.

## SURVEY EFFORT

Trout populations were surveyed during summer baseflow conditions using DNR wadeable stream survey protocols (Simonson 2015). Using this protocol, two kinds of wadeable electrofishing gear were deployed to sample fish populations and assemblages. Tow-barge electrofishing units with 2-3 DNR staff, equipped with 1-3 probes and 1-3 dip nets (0.125-inch mesh) were used for larger wadeable streams with mean channel width ≥ 3 m. In smaller streams with mean channel width < 3 m, a backpack electrofishing unit with 1 probe and 1 net was used. The amount of

electrofishing sampling effort (distance sampled) per survey station was 35 times the mean channel width. A minimum distance of 100 m was sampled in survey stations in streams with mean stream width < 3 m. All fish encountered were netted and placed in a live-well for processing. All sampled fish were identified to species, enumerated and total length of gamefish were measured to the nearest 0.1 inch. Fish were returned to the stream immediately after data were collected.

Fish habitat and other environmental data were collected on site either immediately before or after the fish survey to reflect real-time habitat conditions experienced by the fish surveyed. At each survey station, mean wetted channel width, streamflow, water temperature, specific conductivity and dissolved oxygen concentration were collected following DNR standard wadeable survey protocols (Simonson 2015). Discharge was measured at one transect at the downstream end of each survey station using a HACH FH950 handheld flow meter with survey rod. Water temperature, dissolved oxygen and specific conductivity were collected using a handheld YSI Pro 2030 meter. We also performed a rapid wadeable qualitative stream habitat assessment to calculate a stream habitat rating, which provided a useful index describing current habitat conditions for fish. For more details on the habitat methods or the DNR Wadeable Stream Qualitative Fish Habitat Rating System see Simonson et al. (1993).

## DATA ANALYSIS: TROUT POPULATIONS, HABITAT AND BIOTIC INTEGRITY

Trout streams and trout populations were characterized using a suite of fish population, fish assemblage and habitat metrics calculated using survey data. We also obtained various land cover, modeled water temperature and modeled streamflow from the DNR Stream Natural Community Model within the 24K – Value Added Hydrography Dataset (DNR 2014, https://arcg.is/15jXaH) and through Stroud (2021). These data were geoprocessed through Geographic Information Systems (i.e., ArcGIS Pro; ESRI 2021).

Catch per unit effort (CPUE) metrics were calculated as the number of fish captured per mile of electrofishing to index the relative abundance of brook trout and brown trout. Trout CPUE data apportioned out by specific length ranges represent the relative abundance of specific brook and brown trout age and size classes. Brook and brown trout natural reproduction and recruitment were described by calculating Age-0 (< 4 inches for both species) and Age-1 (brook trout = 4-6.9 inches, brown trout = 4-7.9 inches) CPUE, respectively. Adult trout abundance was indexed by calculating brown trout CPUE ≥ 8 inches and brook trout CPUE ≥ 7 inches. To further describe the abundance of larger sized adults, we calculated the CPUE of preferred-size trout CPUE (brown trout ≥ 12 inches; brook trout ≥ 10 inches). Each CPUE metric was initially calculated for each survey station and then summarized by each stream to calculate mean stream CPUE. Stream-specific mean CPUE values of each trout age and size group were compared among all classified trout streams surveyed in this watershed assessment. A separate set of stream-specific trout CPUE comparisons were also

made for unclassified trout streams. Mean stream CPUE metrics were compared to Driftless Area catch rate distribution percentiles for Class I trout streams from surveys conducted 2012-2022, which were used to qualify trout abundance (see Table 4 for further detail). Trout CPUE values falling below the 25$^{th}$ percentile indicated poor abundance, within the 25$^{th}$-49$^{th}$ percentiles indicated fair abundance, within the 50$^{th}$-74$^{th}$ percentiles indicated good abundance and within the 75$^{th}$-100$^{th}$ percentiles indicated excellent abundance. If any adult CPUE were below the 25$^{th}$ percentile, we assessed whether the population met minimum fishable population size, which is an adult trout CPUE > 50 fish/mile. Adult trout populations with CPUE < 50 fish/mile were not considered fishable, since angler success rates diminish at this level of abundance.

Coldwater fish index of biotic integrity (IBI) was calculated to further describe habitat and water quality conditions in trout streams. Trout CPUE metrics can provide valuable insight into the health of cold- and coolwater stream habitats, but coldwater fish IBI scores can provide a more holistic perspective about environmental conditions, especially when trout population data are lacking. Fish IBI is calculated using species composition data collected during standard DNR wadeable electrofishing surveys. The surveyed fishes are grouped together based on ecological and biological similarities (e.g., environmental tolerance, thermal habitat, spawning needs, etc), which are then used to calculate IBI scores (see Lyons et al. (1996) and Lyons et al. (2009) for more information). Fish IBI scores range from 0 (poor) to 100 (excellent) biotic integrity. All IBI scores were summarized by stream, so mean IBI scores could be compared among streams and watersheds.

Fish habitat in trout streams was assessed using the DNR Wadeable Stream Qualitative Fish Habitat Rating System. As previously mentioned, several specific habitat parameter scores (e.g., width to depth ratio, pool prevalence, riparian width, etc.) were evaluated on site and added together to calculate the overall habitat score in each survey station (Simonson et al. 1993). Qualitative habitat scores for survey stations were then summarized by stream. Stream-specific averages were then compared among streams and watershed. Stream habitat quality ratings provide an interpretation of the overall habitat status in streams. Qualitative habitat scores can be rated as either Poor (0-24), Fair (25-49), Good (50-74) or Excellent (75-100).

We also characterized streamflow and thermal habitat to further assess fish habitat. To do this, we assembled water temperature (°F) and streamflow data (cubic feet per second or CFS) measured during this assessment as well as flow and thermal regime data from the DNR Streams Natural Community Model (NCM) dataset. The NCM dataset contains numerous variables that describe the long-term flow and thermal conditions for all Wisconsin streams (available on the DNR Surface Water Data Viewer: https://dnrmaps.wi.gov/H5/?viewer=SWDV). The data from the NCM are model-derived estimates based on 10-30 years of flow and water temperature data. To describe thermal habitat conditions, we first compared measured water temperatures to the upper limit of trout thermal preference (≤63.7°F for brown trout;

Jobling 1981; Dieterman and Mitro 2019). We also compared measured water temperatures and maximum daily mean water temperatures (maximum temperature from 1990-2008; DNR streams NCM) to thermal class thresholds for coldwater (≤69.3° F) and cold-coolwater habitats (≤72.7° F; Lyons et al. 2009). Next, we assessed how our streamflow measurements compared to normal summer baseflows (i.e., August 50% exceedance flow from 1983-2011; DNR streams NCM) to describe habitat availability from groundwater during wet or drought periods. Percentages of normal summer baseflow greater than 90% indicated stable groundwater inputs (i.e., sufficient flow and habitat availability), whereas percentages less than 90% may indicate lower than normal flows, potentially due to drought-like conditions (i.e., low groundwater contribution to flows and less habitat availability).

# Results

In the summer of 2021, 29 Trout Rotation surveys were performed within 13 classified trout streams throughout the Platte and Little Platte River Watersheds (Figure 1; Appendix 1-2). In addition, 24 trout potential surveys were conducted in 11 streams with suspected trout water throughout the Platte and Little River Watersheds. Trout catches, fish assemblage composition and habitat attributes collected from these surveys varied considerably among survey stations.

## TROUT POPULATIONS

Mean stream CPUE of age-0 brown trout ranged from 64-1207 fish/mile in the Little Platte Watershed and 0-1469 fish/mile in the Platte River Watershed (Table 5). The status of age-0 brown trout CPUE was considered to be fair or better (≥ 25$^{th}$ percentile) in 12 of 13 trout streams in both watersheds (Figure 4), indicating most streams had natural reproduction of brown trout. The highest levels of natural reproduction were found in McPherson Branch, Culver Branch and Rountree Branch.

Mean stream CPUE of age-1 brown trout ranged from 0-205 fish/mile in the Little Platte Watershed and 31-1932 fish/mile in the Platte River Watershed (Table 5). The relative abundance age-1 brown trout was considered fair or better (≥ 25$^{th}$ percentile) in 7 of 9 trout streams in the Platte River Watershed and 2 of 4 trout streams in the Little Platte River Watershed. Age-1 brown trout was considered good or better (≥ 50$^{th}$ percentile) in only 3 of 13 trout streams (Figure 5). These streams included Lee Branch, McPherson Creek and Martinville Creek.

Adult brown trout CPUE ranged from 0-237 fish/mile in the Little Platte Watershed and 15-1388 fish/mile in the Platte River Watershed. Adult brown trout CPUE was found to be fair or better (≥ 25$^{th}$ percentile) in 5 of 9 streams in the Platte River Watershed and 2 of 4 streams in the Little Platte River Watershed (Table 5). The status of adult brown trout was considered good or better in only 2 of 13 trout streams (Figure 6), which included Austin Creek and Martinville Creek.

Preferred-size brown trout CPUE varied between 0-45 fish/mile in streams in the Little Platte River Watershed and 0-359 fish/mile in streams within the Platte River Watershed (Table 5). The CPUE of preferred-size brown was considered fair or better in 4 of 9 trout streams in the Platte River Watershed and 2 of 4 trout streams in the Little Platte River Watershed. The status of preferred-size fish was considered good or better in 2 of 13 trout streams (Figure 7), which included McPherson Branch and Martinville Creek.

Of the eleven streams surveyed for trout potential, we detected trout in all streams, with varying degrees of abundance and age-diversity (Table 6). Nine streams contained brown trout populations with at least 2 age-classes present. In the Little Platte River Watershed, these included an unnamed tributary (UNT) to Rountree Branch (WBIC 946100), the UNT to Little Platte River (WBIC 5040500) and unclassified reaches of Rountree Branch and Little Platte River. In the Platte River Watershed, these included Bacon Branch, Bull Branch, Willow Branch, the unnamed tributary to the Platte River (WBIC 954900) and the unclassified middle reaches of the Platte River. Most of these streams contained brown trout, except one brook trout population found in the UNT to the Little Platte River (WBIC 5040505) which was the product of a recent restoration stocking effort. Most notably, we found that the unclassified section of the Platte River contained a significant brown trout population that extended over 24 miles downstream of the classified trout water (Figure 8). This segment of the Platte River contained ≥ 2 age classes of trout and a relative abundance greater than the classified segment of the Platte River but lacked signs of significant natural reproduction.

## FISH BIOTIC INTEGRITY

The fish assemblages surveyed in the trout streams of the Platte and Little Platte Watershed described unique patterns of biological integrity. Trout streams exhibited coldwater fish IBI scores ranging from “poor” to “fair”, but overall were considered “poor” for both the Platte River Watershed (mean IBI = 20.6; range 3.3-40.0; Table 7) and the Little Platte River Basin (mean IBI = 21.7; range 10.0-33.3). Only 34% of stream locations exhibited “fair” or better IBI scores. We observed higher IBI scores in sites with greater abundance of brown trout and lower abundance of fish species known to be tolerant to environmental degradation. Besides trout, few coldwater fish species such as mottled sculpin were found in these surveys, which is unusual because they typically occur throughout many coldwater streams in Wisconsin.

## FISH HABITAT

The fish habitat in classified trout streams in the Platte and Little Platte River Watersheds provided a positive outlook about stream conditions. Based on the Qualitative Fish Habitat Rating System, overall fish habitat in trout streams was rated as “Good” in both the Platte River Watershed (mean habitat score = 58.6, 43.0-73.0; Table 8) and in the Little Platte River Watershed (mean habitat score = 57.6, 46.6-

70.0). The lowest mean habitat scores occurred in Lee Branch, Little Platte River and the unnamed tributary (3000364) to the Rountree Branch, which were considered "Fair". We found that site level habitat scores were closely associated with the amount of fish cover, pool area and habitat diversity observed in each survey location.

The streamflow conditions in these trout streams were similar to typical headwater and mainstem flow regimes defined by the DNR Streams NCM. Measured streamflow ranged from 1.2 to 7.9 CFS in the Platte River Watershed and 0.1 to 5.5 CFS in the Little Platte River Watershed (Table 8). We found that 85% of stream reaches exhibited normal or greater than normal summer flows, indicating most streams contained a sufficient amount of cool and coldwater habitat volume. Stream reaches exhibiting lower than normal summer flows often occurred within smaller headwater streams (normal summer flows < 4 CFS), which were probably more prone to variable flow conditions throughout the year. Specifically, we found lower than normal summer flows within the Rountree Branch, McPherson Branch and Martinville Creek.

Most survey stations had coldwater to cool-coldwater thermal regimes as defined by the DNR Streams Natural Classification Model. Measured water temperatures ranged from 59.3 to 67.7° F in the Platte River Watershed and 63.2 to 67.0° F in the Little Platte River Watershed (Table 8). Overall, 85% of station-specific water temperatures were considered to be within the coldwater thermal regime (<69.3° F). Of the 15% of stream reaches exceeding the coldwater temperature threshold, only one reach of the Platte River and one reach of Leggett Creek were found to exceed the upper threshold for cold-coolwater regimes (≥72.5° F). Modeled maximum daily temperatures ranged from 68.1 to 71.0° F in the Platte River Watershed and 70.4 to 72.3° F in the Little Platte River Watershed. All station-specific maximum daily temperatures never exceeded the 7-day thermal tolerance limit for Wisconsin trout (≥73.9° F).

# Discussion

This rotational assessment of the Platte and Little Platte River Watersheds provided an encouraging outlook about the status of trout populations and stream habitat. Overall, we found brown trout populations to be more naturally productive than previously expected, with fishable populations available in most streams. We also found that the spatial extent of trout populations has expanded, which is likely a result of current habitat conditions. The results from this assessment indicated a need to update the trout management in these watersheds, particularly in terms of trout classification, stocking practices, fishing regulations and habitat management.

The status of brown trout in the classified trout streams of the Platte and Little Platte River Watersheds was generally characterized as fair to good. Most notably, we found there was considerable brown trout natural reproduction and natural recruitment in most streams. The majority of trout streams contained fishable adult brown trout populations and many contained larger trout (≥12 inches). However, not all streams

exhibited strong adult populations. Some smaller streams appeared to be primarily spawning and rearing areas with mostly juvenile fish. Based on the widespread prevalence of brown trout natural reproduction and recruitment, it appears that stocking is not necessary in most of these streams and changes in trout stream classifications are warranted. For the remaining brown trout populations that did not exhibit sufficient natural reproduction and recruitment, stocking may be warranted, along with continued evaluation after the next assessment.

With high amounts of synchronous brown trout natural reproduction happening regionally in 2021, it was uncertain how consistent natural reproduction may actually be over time. This is of importance when considering the trout stream classification. Streams with high natural reproduction of age-0 fish yet lacking signs of age-1 recruitment and adult fish could be the product of a one-time spawning success due to perfect environmental conditions. Whether brown trout survive to subsequent age classes in these habitats is uncertain at the moment. Therefore, it is prudent to hold off on classifying or reclassifying certain streams until these trout population demographics can be observed again during the next assessment.

Environmental conditions appeared to be relatively good for brown trout populations based on habitat quality and suitable thermal and streamflow conditions. Many of the assessed stream reaches were rated as having “Good” habitat quality, reflecting optimal amounts of fish cover, pool area and habitat diversity. This was a positive sign of habitat recovery because many of the surveyed habitat and trout population characteristics were noticeably different than in the past. Even in the recent past, trout streams of these watersheds were either non-existent or barely viable due the prevalence of habitat degradation and nonpoint source pollution (DNR 1991). These changes in habitat, along with the increases in brown trout productivity corroborate the findings of Gebert et al. (2011, 2016), who identified increasing baseflows and decreasing peak flows over time in the Platte River. This may reflect improved land use practices and greater groundwater recharge throughout these watersheds.

Still, not all streams had optimal habitat and few habitat improvements have been performed in these watersheds over the last 20 years. There is still a need to reconnect floodplains, stabilize banks and implement other conservation efforts to protect and improve stream habitats. The positive changes observed in fish habitat provide additional motivation to further rehabilitate and protect streams in these watersheds. Due to the lack of easements and streambank easement acquisition eligibility in many parts of upper Platte River Watershed, DNR habitat management will not be possible in the foreseeable future. In the meantime, riparian landowners should be encouraged to implement conservation practices that protect and enhance stream habitat, in conjunction with the county conservation department and the Natural Resources Conservation Service (NRCS).

## PLATTE RIVER WATERSHED

### PLATTE RIVER

Brown trout population characteristics varied considerably throughout the length of the Platte River, where brown trout abundance was noticeably limited in the classified trout water of the upper Platte River (i.e., upstream of Annaton Road). Even with regular stocking over the last 20 years, brown trout abundance levels rarely produced fishable opportunities during that time period. Neither brown trout stocking nor natural reproduction appear to be sustaining adult abundance in this segment of stream, which may be attributed to habitat degradation and several localized instances of elevated water temperature observed in the upper Platte River. Either stocked fish were not surviving or they moved downstream to preferred habitats.

Surprisingly, the unclassified middle reaches of the Platte River contained brown trout population characteristics that were more productive than in the upstream Class II water. Over 24 miles downstream of Annaton Road, age-1 and adult brown trout abundance were greater than in the upstream population. The mean adult abundance alone was 3.7 times that of the classified trout water upstream. On average, natural age-1 brown trout comprised 33% of total brown trout downstream of Annaton Road. The lack of age-0 brown trout in mainstem suggests natural reproduction is limited in the mainstem river and that natural age-1 fish are probably recruiting from adjacent tributaries showing sufficient amounts of natural reproduction (e.g., Culver Branch, Lee Branch, Austin Branch, McPherson Branch and Leggett Creek). Whether or not adult abundance is solely sustained through sources of natural reproduction from tributaries is unknown at the moment. Further assessment is needed to understand if hatchery fish are contributing to adult abundance from upstream stocking events. The contribution of marked hatchery trout should be evaluated during the next assessment in 2027.

Historically, brown trout have been regularly captured in this middle segment of the Platte River, but they were never abundant or prevalent. Long-term increases in baseflow and recharge have likely increased cold- and coolwater habitat availability in these middle reaches of the Platte River. These increases in baseflow along with increased brown trout abundance and distribution suggests brown trout have expanded their population further downstream throughout the middle reaches of the river. Based on the current age-structure and unknown recruitment origin (i.e., stocked vs natural) of these populations, it is recommended that this middle segment of the Platte River be classified as Class II trout water.

This newly recognized brown trout population extends from Annaton Road downstream to Big Platte Road (0.75 miles downstream of County Highway (CTH) B). Brown trout corresponded with the distribution of coolwater habitat found throughout the mainstem channel of river. Based on the DNR Natural Stream

Community Model, this coolwater mainstem habitat is relatively contiguous until CTH B, where warmwater habitat becomes prevalent. Although the occurrence of brown trout spreads out for more than 24 miles, the abundance of brown trout has a slightly smaller spatial extent. Sites with greatest total abundance occurred in the reaches between Annaton Road and the lower crossing of Platte Road (upstream of Red Dog Road). This also reflects the extent of where adult brown abundance exceeds minimum fishable adult population size (CPUE > 50 fish/mile). It is unknown where abundance actually diminishes between Airport Road and the lower crossing of Platte Road. For now, it is recommended the Platte River be classified as Class II trout water from Annaton Road to the upper crossing of Platte Road (upstream of Baker Ford Road). Additional survey work should be conducted to confirm this downstream boundary during the next assessment.

Beyond the classification of the middle Platte River, it was also important to note that this adult brown trout population contained higher proportions of fish ≥ 12 in. Local stakeholder input often described the high size structure of brown trout as an important feature of this fishery, deserving better protection. To best manage a large-sized stream with low to moderate recruitment and high size structure, a 12-inch minimum length limit with 2 fish daily bag limit is recommended. This regulation not only helps to maintain population size structure, but it helps to increase the abundance of age-1 and adult fish. Currently, adult brown trout numbers are considered fishable but are below abundance levels considered fair. Based on observed brown trout abundance levels, it is possible the proposed regulation could increase adult and preferred size abundance to more desirable levels (≥ 50$^{th}$ percentile). Achieving these abundance objectives would help improve the consistency of the fishery. It is recommended that 12-inch minimum length limit be implemented in the Platte River to improve brown trout abundance and size structure.

**MARTINVILLE CREEK**

This assessment identified Martinville Creek as one of the most productive brown trout populations in the Platte River Watershed. The stream had substantial amounts of natural reproduction and recruitment. The stream also had a high adult abundance with notably high size structure. Those adult population features should offer considerable fishing opportunities. It should be noted that the high abundance of preferred-size (≥12 in) brown trout was unique, since it can be atypical for smaller headwater streams (streamflow < 3.0 CFS) to consistently produce trout populations with high size structure. Although this stream has been stocked in the past, it appears to have a self-sustaining population that should not require future stocking. Martinville Creek should also be reclassified from a Class II to a Class I trout stream.

This productive brown trout population is likely the result of suitable habitat and other environmental conditions in Martinville Creek. In general, the quality physical habitat in Martinville Creek was considered good. The stream normally exhibits a

coolwater thermal regime, yet water temperatures were observed well within the preferred range for brown trout (< 63.7° F; Wehrly et al. 2007). The only limitations observed were with the lower-than-normal baseflows, lower IBI scores, poor bank erosion scores and fine sediment scores. Although stream conditions are currently good, it will be important to monitor streamflow because it can fluctuate in smaller streams and change trout population carrying capacity and habitat availably. Still, the variable streamflow in Martinville Creek does not appear to be limiting this self-sustaining population.

Surprisingly, Martinville Creek has had a history of habitat impairments related to sedimentation. In 2007, the DNR initiated a TMDL plan to address these sedimentation and nonpoint source issues with local riparian landowners. Based on our findings, it appears that the trout stream is gradually improving, but further monitoring of the trout population will be necessary as part of this TMDL plan. We recommend working with our internal DNR partners as they carry out this TMDL plan to improve stream habitat and water quality in Martinville Creek.

**AUSTIN BRANCH**

The brown trout of Austin Branch exhibited self-sustaining population characteristics that were similar to Martinville Creek, yet the habitat in Austin Branch was noticeably different. Austin Branch has a coldwater thermal regime with lower water temperatures within the preferred range for brown trout. The habitat quality was exceptional and contained above normal baseflows, allowing for greater habitat availability and carrying capacity. The Austin Branch has had no recent history of impairments, yet the coldwater IBI scores we observed were lower than expected. Establishing stream buffers and other habitat improvements via streambank easements could help to maintain a consistent fishable population of brown trout. Currently, there are no streambank easements and there is no eligibility for any new acquisitions, so no DNR habitat management can be performed in the near future. With DNR master planning efforts underway in 2023-2024, it is recommended to propose eligibility for streambank easement acquisition on Austin Branch. We also recommend upgrading Austin Branch from Class II to Class I trout water and discontinuing stocking, based on its self-sustaining brown trout population.

**MCPHERSON BRANCH**

McPherson Branch was the only designated Class I trout stream in the Platte River Watershed. The abundant brown trout population indicated that McPherson Branch is still a Class I trout stream. In fact, the highest observed natural reproduction in the Platte River Watershed occurred in McPherson Branch. This population contained a moderate abundance of adult brown trout that should provide a fishable population with opportunities for fish > 12-inches. Past habitat improvement work and riparian protections from several streambank easements likely have maintained the productivity of brown trout in this stream. Habitat characteristics ranged from fair to excellent along the length of the stream. The downstream reaches exhibited typical

coldwater temperatures, above normal streamflow, excellent habitat quality and a good coldwater IBI rating. Upstream surveys showed lower than normal baseflows, warmer water temperatures, increased bank erosion and greater sedimentation issues. The addition of upstream streambank easements could allow the DNR to establish and maintain riparian buffers to protect water quality and habitat. Since McPherson Branch is eligible for streambank easement acquisition, we recommend performing outreach with landowners to acquire more streambank easements in upstream reaches. We also recommend maintenance and updates to existing habitat improvements because the last habitat management was performed over 20 years ago.

**CULVER BRANCH AND LEE BRANCH**

These neighboring, small coldwater tributaries to the middle Platte River contained brown trout populations with exceptionally highly levels of natural reproduction and likely represent sources of juvenile recruitment to the mainstem Platte River. We did find adult brown trout in both streams, but adult abundances capable of providing a fishery were only evident in Culver Branch. Regardless, the high juvenile brown trout abundances indicate that these two streams provide important spawning and rearing habitats. Culver Branch and Lee Branch are Class II brown trout populations with stocking histories, yet both have the natural reproduction and recruitment necessary to sustain adult populations without stocking. Therefore, both of these streams should be reclassified as Class I trout waters. Stocking should be discontinued in Culver Branch; stocking was discontinued in Lee Branch in the late 1970s.

The habitat characteristics in Culver Branch and Lee Branch were variable but overall habitat quality was considered Fair to Good. Both streams had above normal streamflow and water temperatures were within the thermal preference range for brown trout. The only environmental limitations identified were related to watershed characteristics, historic stream impairments and low biotic integrity scores. Culver Branch was considered impaired because of nonpoint source pollution in 1998, but recently has shown improvements in physical habitat and biotic integrity. On the other hand, Lee Branch had no past impairments, yet Lee branch had the lowest habitat quality of any stream in the Platte River Watershed. Both of these streams have self-sustaining brown trout populations that could benefit from habitat management, but more detailed survey work is needed to better define population and habitat needs before further habitat management can be considered.

**CROW BRANCH**

The Crow Branch trout population and habitat characteristics were better than expected. Prior to this assessment, this Class II stream was stocked to maintain a fishable brown trout population due to poor natural recruitment. During this assessment, the Crow Branch showed fair amounts of brown trout natural reproduction and recruitment capable of sustaining adult abundances without stocking. Adult brown trout abundance was below the 25$^{th}$ percentile, yet it was still

considered a fishable abundance (>50 fish/mile). Historically, brown trout populations have always exhibited low adult abundance with little to no natural reproduction or recruitment. The recent evidence of natural reproduction and recruitment could mean that habitat conditions have improved over time for trout. Crow Branch habitat quality was good, baseflows provided sufficient habitat availability and water temperatures were within the preferred range for brown trout. Surprisingly, we observed extremely poor coldwater IBI scores, which contradicts other recent water quality assessment data. We are unsure what these low IBI scores imply for future brown trout populations, but we plan to continue monitoring this population, paying close attention to stream health. Based on the history of poor adult brown trout abundance and the recent increase in natural reproduction and recruitment, we recommend discontinuing stocking in Crow Branch. If Crow Branch continues to show self-sustaining population characteristics in the absence of stocking, we will consider reclassifying the Crow Branch as Class I trout water. For now, the Crow Branch should maintain its current trout classification.

**LEGGETT CREEK**

Leggett Creek is one of the larger tributaries to the Platte River that was found to contain a brown trout population with better-than-expected age-structure and abundance characteristics. Prior to this survey, Leggett Creek was thought to be heavily reliant on stocking due to depressed natural reproduction and recruitment. Surprisingly, brown trout were observed to have excellent natural reproduction and fair recruitment. We also observed fair abundance of both adult and preferred size brown trout. It was apparent natural recruitment sustained an adult brown trout population with a large proportion of preferred-size fish. Based on the age structure and self-sustaining characteristics of the population, Leggett Creek should be reclassified from Class II to Class I trout water and stocking should be discontinued.

The habitat conditions in Leggett Creek were suitable yet somewhat marginal for brown trout. Streamflow levels were fairly normal throughout the stream and provided good habitat availability. The thermal habitat was within the cold to coolwater range, but water temperatures were above the preferred temperature range for brown trout. Because of the history of degradation and impairments and the prevalence of erosion in Leggett Creek, it was difficult to explain why trout abundance has improved so much. One possible explanation is that water quality and habitat conditions have improved over time. Impairments may still occur in the stream, but there were several high-quality habitat features making Leggett Creek a productive trout stream. Leggett Creek had several medium size springs (0.25 to 1.0 CFS) with numerous smaller springs (<0.25 CFS) feeding the stream, a high percentage of course rocky substrate in the channel and the modest habitat diversity. The history of impairments still remains a concern for Leggett Creek as stocking discontinues. Therefore, it will be important to monitor how well natural reproduction will support this stream into the future.

**NEWELL CREEK**

Newell Creek is a coolwater tributary to Leggett Creek currently containing a brown trout population showing some natural reproduction. The brown trout surveyed displayed a fair abundance of age-0 fish with low numbers of age-1 and adult fish. Although natural reproduction levels were higher than expected for Newell Creek, their limited survival and recruitment to older age classes indicated that the brown trout population is not self-sustaining. Still, it is positive sign that some natural reproduction has occurred in this stream with no past evidence of natural reproduction. In fact, previous surveys performed in 2007 and 2009 found no evidence trout populations in Newell Creek. Past attempts to stock small fingerlings from 2009-2017 had poor evidence of carryover, so stocking was stopped in 2018. The brown trout observed in this assessment was an indication that the stream may be improving on its own, based on the high natural reproduction. With high levels of brown trout natural reproduction happening regionally due to environmental factors (e.g., streamflow and winter precipitation), it is uncertain whether natural reproduction will be consistent in Newell Creek. Therefore, the current management and Class II designation of Newell Creek should remain the same for now and future survey work should focus on confirming brown trout natural reproduction in the stream.

**UNCLASSIFIED TROUT STREAMS**

Willow Branch, Bacon Branch, Bull Branch and the unnamed tributary (WBIC 954900) to the Platte River all contained brown trout with varying population characteristics. All of these streams had no apparent history of brown trout stocking and contained at least two age-classes. Past surveys of these streams showed a limited history of trout. Historically, these streams were monitored for smallmouth bass or for water quality purposes, with little thought that these streams could eventually contain trout populations. The recent evidence of brown trout occupying these streams may be a sign that habitat is more conducive to trout than previously thought.

The Willow Branch contained a brown trout population with 2-3 age classes observed in two reaches of the stream. There was low abundance of adult fish observed, yet its adult abundance was considered fishable. Natural reproduction and recruitment were present in the stream but at levels not typical of self-sustaining Class I trout water. Prior to this assessment, similar brown trout abundance and age-structure was surveyed in the Willow Branch in 2020. This previous survey provides evidence of the Willow Branch has an established trout population. Good habitat quality (i.e., prevalent coarse rocky substrate, fish cover, riffle occurrence and diversity) and the cold and coolwater thermal characteristics were found throughout the stream, indicating the Willow Branch is suitable for trout. Based on these findings, we recommend classifying the Willow Branch as a Class II trout stream for now. Future monitoring of this population is recommended before considering future management actions.

The other unclassified streams contained brown trout of various ages but did not have the strong evidence to justify trout stream classification. Both Bull Branch and unnamed tributary to the Platte River (WBIC 954900) contained at least two age-classes of brown trout, but with limited abundance. Bacon Branch was the only unclassified stream in the Platte River Watershed to exhibit a fair amount of natural reproduction but showed limited evidence of age-1 and older populations. These coolwater streams were known to be smallmouth bass water in the past and it is unknown how long these brown trout populations have been established in these streams. Further temperature monitoring and fish survey work is recommended in Bull Branch, Bacon Branch and the unnamed tributary (WBIC 954900) of the Platte River before considering these streams for trout classification.

## LITTLE PLATTE RIVER WATERSHED

### LITTLE PLATTE RIVER

The Class II trout water of the Little Platte River is located in the upper reaches of the river, near Arthur (unincorporated community). Based on overall brown trout abundance and age-structure, the Little Platte River exhibited sufficient natural reproduction and recruitment to sustain a fishery without stocking. We observed a fishable population of brown trout with above average opportunities to catch fish ≥ 12-inches. Since the population appears to be self-sustaining, we recommend reclassifying the Class II trout water in the Little Platte River to Class I and discontinuing stocking.

The unique habitat features of the Little Platte River seem to be the most important factors influencing brown trout abundance. Interestingly, we found that abundance of all brown trout age-classes was highest just upstream of STH 80, where a large (7.1 CFS) spring discharges into the river. This spring likely has a profound environmental influence on the brown trout population. We suspect this spring creates stable coldwater temperatures and habitat volume necessary for a highly productive brown trout population. Although this spring helps to regulate thermal habitat, other aspects of habitat quality showed signs of degradation, including a prevalence of bank erosion and fine sediment accumulation. Available pool habitat also varied greatly among stream reaches. Because nearly all of the trout water is surrounded by streambank easements, we recommend performing future habitat improvements, specifically riparian bank stabilization, floodplain reconnection and installation of structures to create scour and mobilize fine sediments.

The current trout fishing regulation on the Little Platte River only allows for catch and release fishing with no harvest opportunities. This regulation has been in place since 1990 and was implemented to maintain trout abundance at a time when less public fishing access existed. Now that there are greater access opportunities and adult brown trout are more abundant, it makes sense to provide anglers more harvest opportunities. Because adult abundance was as high as 690.9 fish/mile,

allowing some regulated harvest will probably not reduce the population. With this in mind, our objectives will be to maintain adult brown trout abundance between 25th and 75th percentiles (128.7-509.7 fish/mile) and maintain preferred size brown trout abundance > 25th percentile (31.9 fish/mile). We recommend changing the current catch and release fishing regulation to the county base regulation (i.e., 3-fish daily bag limit with an 8-inch minimum length limit) to provide greater opportunities for harvest and simplify regulations.

**ROUNTREE BRANCH AND ITS UNNAMED TRIBUTARY (WBIC 3000364)**

The Rountree Branch is currently the only Class I trout stream in the Little Platte River Watershed. This wild brown trout population is very unique in that the majority of the stream flows through the City of Platteville. Most streams with significant amounts of impervious land cover in local catchments and riparian areas generally do not contain abundant trout populations due to effects of runoff on habitat and water quality (Wang et al. 2003). Interestingly, we observed good to excellent levels of habitat quality throughout Rountree Branch, with no significant flow or thermal limitations.

The brown trout population of the Rountree Branch contained the highest level of natural reproduction within the Little Platte Watershed, which allowed for sufficient recruitment of yearling fish to support a fishable adult population. It was also notable that the stream contained fair numbers of 12” and larger brown trout. These population characteristics confirmed that the Rountree Branch still fits the definition of Class I trout water. Brown trout natural reproduction was found throughout the stream and in some of its connected tributaries, notably the unnamed tributary (WBIC 3000364). Even though these tributaries likely contribute age-0 recruitment into the mainstem Rountree Branch, the populations were typically represented a single age-class and therefore do not meet the definition of Class I trout water. Based on these findings, we recommend maintaining the current Class I trout water designation of the Rountree Branch as well as the Class II trout water designation in its unnamed tributary (WBIC 3000364).

**SNOWDEN BRANCH**

Snowden Branch is a coolwater stream with Class II trout water designation that has not been stocked since 1997, when the stream was listed for impairments due to nonpoint source pollution and sedimentation impacts. During the current surveys, fair brown trout natural reproduction was found with lower-than-normal (< 25th percentile) abundances of age-1 and adult fish. This evidence of diminished recruitment and survival to adult ages suggests that Snowden Branch is still Class II trout water. Historically, adult abundance has fluctuated considerably with only 50% of survey years showing a fishable adult abundance. Compared to the previous surveys in 2009-2013, these recent observations of age-1 and adult brown trout abundance have shown signs of potential decline. The sedimentation impairments have likely hindered natural reproduction and recruitment, making it more difficult

to sustain adult abundance overtime. Natural recruitment may be hindered by these habitat limitations, yet they have not chronically impacted age-1 survival to adult life stages, based on past data. This means it may be possible to improve and maintain adult abundance by utilizing stocking practices. Therefore, it is recommended that Snowden Branch receive stocking again to provide fishable brown trout abundance until the population can sustain itself naturally.

Similar to the intensive impairment issues in Martinville Branch, a TMDL plan was initiated on Snowden Branch in 2006 to address water quality and habitat degradation issues. It was surprising to see these impairment issues on the Snowden Branch with the amount of streambank easements that have been established. Streambank easement can help to buffer the impacts from nonpoint source pollution, but Snowden Branch still continues to be listed for these impairments. Fortunately, recent IBI data from 2018 did not indicate biological impairments. During these surveys, overall habitat conditions were considered fair to good. Perhaps environmental conditions are showing signs of improvement. With this in mind, it will be important to monitor how the brown trout population responds to stocking and changes in the habitat during the next assessment.

**UNCLASSIFIED TROUT STREAMS**

Of the six streams surveyed with unclassified trout water, four streams provided indications of trout populations. These included the unclassified reaches of Rountree Branch (as previously mentioned), the unnamed tributary (WBIC 946100) to Rountree Branch, the unnamed tributary (WBIC 5040505) to the Little Platte River and reaches of the Little Platte River mainstem. The Mounds Branch and Blockhouse Creek showed minimal brown trout numbers and little to no age-class diversity, suggesting that trout randomly moved in these streams from connected trout waters.

In the middle reaches of the Little Platte River near Platteville, a total of 43 age -1 and adult brown trout were found at 2 locations that were isolated from other brown trout populations located further upstream and from known tributary populations. This lack of connection or close proximity to other known brown trout populations and the prevalence of warmwater habitat within these stream reaches suggest these were not typical trout populations. This isolated middle reach of the Little Platte is currently not a candidate for classification as trout water. However, higher than expected numbers of trout indicate that these stream reaches and nearby tributaries should be surveyed again in the next rotational assessment in 2027. If stable numbers of trout continue to persist, future trout stream classification may be warranted.

In the Rountree Branch and its tributaries, evidence was found of expanded Class I trout water in the mainstem Rountree Branch and its unclassified tributary (WBIC 946100). The downstream unclassified mainstem Rountree Branch contained a brown trout population with 3 or more age-classes, similar to the upstream Rountree Branch population, suggesting these contiguous waters downstream should all be

Class I. The unclassified tributary (WBIC 946100) to the Rountree Branch contained a fair amount of natural reproduction and also had at least 2 age-classes of brown trout. Future assessment is needed to confirm if this tributary (WBIC 946100) still contains a trout population before considering trout stream classification.

The unnamed tributary (WBIC 5040505) to Little Platte River is a small coldwater stream containing an isolated brook trout population. This stream contained multiple age-classes of brook trout and evidence of natural reproduction. Stocking to reintroduce and establish a population of brook trout occurred in 2019 and 2020. The population observed indicated that some brook trout have survived from the 2020 stocking, but none of 2019 fish appeared to survive to adult life stages. However, it appears that brook trout were able to spawn and have successful natural reproduction based on the abundance of age-0 fish observed in the stream. Still, little can be said about whether this population has become established or whether natural age-1 recruitment occurred, since stocking occurred in the 2 years prior to this survey. Therefore, this unnamed tributary (WBIC 5040505) to the Little Platte River should not be considered for trout classification at this time. This stream should be surveyed during the next assessment rotation to see if brook trout still persist.

# Management Recommendations

**Brown trout population goals**

1. **Goal:** Increase and maintain fishable adult populations of brown trout in Platte and Little Platte River Watersheds
   **Objectives:**
   Adult CPUE > 128.7 fish/mile (> 25$^{th}$ percentile for Driftless Area)
   **Strategies:**
   Habitat improvement to increase adult carrying capacity, when practical.
   Stock Large fingerlings as necessary in Class 2 streams with adequate public access.

2. **Goal:** Increase and maintain brown trout natural recruitment in Platte and Little Platte River Watersheds
   **Objective:**
   Age-1 CPUE > 230 fish/mile (> 50$^{th}$ percentile for Driftless Area)
   **Strategies:**
   Habitat improvement to increase natural recruitment potential, when practical. Acquire streambank protection easements.

3. **Goal:** Increase adult brown abundance and maintain high size structure in the Platte River.
   **Objectives:**

Adult brown trout CPUE: 191.6-330.8 fish/mile (35th-50th percentile for Driftless Area)
Preferred-size brown trout CPUE: 42.9-63.2 (35th-50th percentile for Driftless Area)
**Strategies:**
Implement 12-inch minimum length limit and 2 fish daily bag limit. Stock 1260 large fingerling brown trout annually into the upper Platte River.

4. **Goal:** Simplify regulations and provide a harvest opportunity in the Little Platte River while maintaining current abundance and size structure.
   **Objectives:**
   Adult brown trout CPUE: 128.7-509.7 fish/mile (25th-75th percentile for Driftless Area)
   Preferred-size brown trout CPUE > 31.9 fish/mile (>25th percentile for Driftless Area)
   **Strategies:**
   Change the catch and release fishing regulation to the county base regulation (8" minimum length limit, 3 daily bag limit).

**Additional recommendations:**

1. **Trout classification:**
   A. Reclassify these Class II streams to Class I: Austin Branch, Leggett Creek, Martinville Creek, Culver Branch, Lee Branch and Little Platte River.

   B. Extend the Class I trout water of the Rountree Branch downstream to the confluence with the Little Platte River.

   C. Amend the Class II trout water of the Platte River, so its downstream boundary is the Platte Road bridge (Lat: 42.76285°, Long: -90.61373°), near Ellenboro.

   D. Classify Willow Branch as Class II trout water.

2. **Stocking recommendations:**
   A. Discontinue brown trout stocking in streams proposed for designation as Class I trout streams.
   B. Stock 1230 large fingerling brown trout annually into the Snowden Branch

3. **Monitoring and assessment recommendations:**
   A. Evaluate the contribution of hatchery brown trout in the Platte River.

   B. Deploy temperature loggers throughout the watersheds during the 2027 rotational assessment, for improved assessment of thermal conditions from March to October.

4. **Streambank easements:**
   A. Perform streambank easement outreach in all eligible trout streams in the Platte River Watershed.

   B. Propose further streambank easement acquisition eligibility in trout streams in the Platte River Watershed during DNR property planning.

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# Tables and Figures

*Table 1. A summary of the current management regime for classified trout streams in the Platte and Little Platte River Watersheds, Grant County, 2021. The management regime reflects aspects of the trout species managed, reproductive category, habitat management history and harvest regulations. Harvest regulation abbreviations include 3x8 = 3 fish daily bag limit with an 8-inch minimum length limit for all trout and C&R = catch and release fishing for all trout. Reproductive category abbreviations include NR = Natural Reproduction, S = Stocked and UNK = Unknown Recruitment. Annual stocking regime abbreviations include LGF = Large Fingerling, SMF = Small Fingerling, BNT = brown trout and BKT = brook trout.*

| WATERSHED | STREAM | MANAGED TROUT SPECIES | TROUT CLASS | TROUT STREAM MILEAGE | REPRODUCTIVE CATEGORY | ANNUAL STOCKING | HABITAT MANAGEMENT HISTORY | HARVEST REGULATION |
|---|---|---|---|---|---|---|---|---|
| Platte River | Platte River | BROWN | CLASS II | 9.3 | NR & S | 2250 SMF BNT | | 3x8 |
| | Lee Branch | BROWN | CLASS II | 1.5 | NR | | | 3x8 |
| | Culver Branch | BROWN | CLASS II | 2.3 | NR & S | 515 SMF BNT | | 3x8 |
| | McPherson Branch | BROWN | CLASS I | 2.7 | NR | | 2001-2002 | 3x8 |
| | Austin Branch | BROWN | CLASS II | 2.9 | NR & S | 558 SMF BNT | | 3x8 |
| | Leggett Creek | BROWN | CLASS II | 7.0 | NR & S | 1020 LGF BNT | | 3x8 |
| | Newell Creek | BROWN | CLASS II | 3.8 | NR | | | 3x8 |
| | Crow Branch | BROWN | CLASS II | 5.1 | NR & S | 300 SMF BNT | | 3x8 |
| | Martinville Creek | BROWN | CLASS II | 3.9 | NR & S | 900 SMF BNT | | 3x8 |
| Little Platte River | Little Platte River | BROWN | CLASS II | 8.1 | NR & S | 1440 LGF BNT | 1984-1986, 2009-2010 | 3x8, C&R |
| | Snowden Branch | BROWN | CLASS II | 7.7 | NR | | | 3x8 |
| | Rountree Branch | BROWN | CLASS I | 5.2 | NR | | | 3x8 |
| | Unnamed Tributary (3000364) to Rountree Branch | BROWN | CLASS II | 1.3 | NR | | | 3x8 |

*Table 2. A five-year history of small and large fingerling annual stocking quotas prior to the trout population assessment in the Platte River and Little Platte River Watersheds, in Grant County.*

| | | | | | FIVE-YEAR TIMELINE | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WATERSHED | STREAM | TROUT CLASS | TROUT SPECIES | HATCHERY PRODUCT | 2016 | 2017 | 2018 | 2019 | 2020 |
| Platte River | Platte River | Class II | Brown | Small Fingerling | 1617 | 2066 | 2250 | 4500 | |
| | Culver Branch | Class II | Brown | Small Fingerling | 402 | 672 | 300 | 745 | |
| | Austin Branch | Class II | Brown | Small Fingerling | 452 | 672 | 558 | 808 | |
| | McPherson | Class I | Brown | Small Fingerling | 202 | 672 | | | |
| | Leggett Creek | Class II | Brown | Small Fingerling | 1213 | 1552 | | | |
| | | | | Large Fingerling | | | 1100 | 1020 | |
| | Newell Creek | Class II | Brown | Small Fingerling | 604 | 517 | | | |
| | Crow Branch | Class II | Brown | Small Fingerling | | 259 | 120 | 174 | |
| | Martinville Creek | Class II | Brown | Small Fingerling | 607 | 826 | 840 | 840 | |
| Little Platte River | Little Platte River | Class II | Brown | Small Fingerling | 1685 | 2295 | 2400 | 4800 | |
| | Unnamed Tributary (5040505) to Little Platte River | Unclassified | BROOK | Small Fingerling | | | | 250 | |
| | | | | Large Fingerling | | | | | 443 |

*Table 3. Summary of land cover characteristics in the Platte River and Little Platte River Watersheds, in Grant County.*

| | PLATTE RIVER WATERSHED | | LITTLE PLATTE RIVER WATERSHED | |
|---|---|---|---|---|
| COVER TYPE | AREA (SQ. MI.) | % OF WATERSHED | AREA (SQ. MI.) | % OF WATERSHED |
| Open water | 0.8 | 0.2 | 0.2 | 0.1 |
| Developed and Barren | 22.6 | 4.9 | 32.5 | 8.0 |
| Forest | 96.4 | 21.0 | 48.0 | 12.0 |
| Grassland | 0.5 | 0.1 | 0.3 | 0.1 |
| Agriculture | 335.4 | 72.9 | 317.4 | 79.3 |
| Wetland | 4.3 | 0.9 | 1.9 | 0.5 |

*Table 4. Brown and brook trout CPUE (fish/mile) percentile summary for stream surveys conducted in Class I trout streams in the Driftless Area, where at least 1 trout was collected, 2012-2021.*

| | | DRIFTLESS AREA PERCENTILES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SPECIES** | **CPUE METRIC** | **10th** | **25TH** | **35TH** | **50TH** | **65TH** | **75TH** | **90th** |
| Brown Trout | Age-0 (<4") | 15.1 | 40.2 | 71.1 | 136.1 | 256.1 | 405.4 | 856.7 |
| | Age-1 (4-7.9") | 27.9 | 82.6 | 135.6 | 229.9 | 383.2 | 518.8 | 877.1 |
| | Adult (≥8") | 40.2 | 128.7 | 191.6 | 330.8 | 509.7 | 677.6 | 1194.2 |
| | Preferred size (≥12") | 16.1 | 31.9 | 42.9 | 63.2 | 85.8 | 115.0 | 181.5 |
| Brook Trout | Age-0 (<4") | 16.0 | 46.0 | 68.6 | 128.7 | 209.2 | 321.9 | 787.1 |
| | Age-1 (4-6.9") | 12.4 | 30.5 | 44.9 | 80.5 | 150.9 | 234.2 | 548.7 |
| | Adult (≥7") | 12.8 | 30.0 | 47.9 | 80.5 | 124.0 | 177.7 | 347.0 |
| | Preferred size (≥10") | 6.5 | 11.1 | 14.3 | 16.1 | 29.1 | 37.5 | 64.4 |

*Table 5. Brown Trout relative abundance (catch per unit effort or CPUE) collected in classified trout streams in the Platte and Little River Watersheds in Grant County, during Trout Rotation Surveys in 2021. Brown Trout CPUE values are the number of fish caught per electrofishing mile at various age and size groups of these populations. The CPUE values are mean estimates for each stream and values in parentheses are the CPUE range of values within a stream.*

| WATERSHED | STREAM | NUMBER OF SURVEYS | AGE-0 CPUE (<4 IN.) | AGE-1 CPUE (4-7.9 IN.) | ADULT CPUE (>8 IN.) | PREFERRED-SIZE CPUE (≥12 IN.) |
|---|---|---|---|---|---|---|
| Platte River | Platte River | 3 | 2.0 (0.0-5.9) | 41.9 (10.8-85.4) | 24.9 (10.8-40.2) | 0.0 (0.0-0.0) |
| | Lee Branch | 1 | 476.9*** | 230.8** | 15.4 | 0.0 |
| | Culver Branch | 1 | 1347.2*** | 222.2* | 180.6* | 0.0 |
| | McPherson Branch | 3 | 1469.4*** (400.8-3333.3) | 419.3** (11.1-807.7) | 282.3* (33.3-512.8) | 73.0** (0.0-153.8) |
| | Austin Branch | 2 | 393.1** (174.5-611.7) | 153.8* (94.0-213.6) | 502.4** (315.4-689.3) | 42.5* (26.8-58.3) |
| | Leggett Creek | 4 | 651.0*** (0.0-1296.7) | 108.7* (19.0-153.8) | 205.9* (25.3-263.7) | 59.6* (0.0-76.9) |
| | Newell Creek | 1 | 135.4* | 31.3 | 31.3 | 0.0 |
| | Crow Branch | 3 | 106.6* (0.0-291.0) | 225.6* (111.9-396.6) | 93.2 (22.4-155.2) | 14.5 (0.0-23.0) |
| | Martinville Creek | 1 | 213.6** | 1932.0*** | 1388.3*** | 359.2*** |
| Little Platte River | Little Platte River | 3 | 306.1** (0.0-918.2) | 205.6* (38.3-481.8) | 237.6* (0.0-690.9) | 45.5** (0.0-136.4) |
| | Snowden Branch | 3 | 64.0* (0.0-132.7) | 3.4 (0.0-10.2) | 4.9 (0.0-14.8) | 2.5 (0.0-7.4) |
| | Rountree Branch | 3 | 1207.4*** (625.0-1630.6) | 157.3* (32.4-360.4) | 179.5* (78.7-297.3) | 35.1* (0.0-132.7) |
| | Unnamed Tributary (3000364) to Rountree Branch | 1 | 181.8** | 0.0 | 0.0 | 0.0 |

** Between 25th-49th percentile = Fair abundance*
*** Between 50th-74th percentile = Good abundance*
**** Between 75th-100th percentile = Excellent abundance*

*Table 6. Brook Trout and Brown Trout catch per unit effort (CPUE; number of fish/electrofishing mile) in unclassified trout streams in the Platte and Little Platte River Watersheds in Grant County, during Trout Potential Surveys in 2021. Stream-specific means and values in parentheses show CPUE ranges (min to max values) in each stream. These CPUE were calculated to describe overall relative abundance of Age-0 (<4 in.), Age-1 (brown trout = 4-7.9 in.; Brook trout 4-6.9 in.), Adult (brown trout ≥8 in.; brook trout ≥7 in) and Preferred-size (brown trout ≥12 in.; brook trout ≥10 in.) trout.*

| WATERSHED | STREAM | SPECIES | NUMBER OF SURVEYS | AGE-0 CPUE | AGE-1 CPUE | ADULT CPUE | PREFERRED-SIZE CPUE |
|---|---|---|---|---|---|---|---|
| Platte River | Platte River | Brown trout | 8 | 1.5 (0.0-6.4) | 46.9 (0.0-84.5) | 91.3 (13.1-293.0) | 29.8 (0.0-121.0) |
| | Willow Branch | Brown trout | 2 | 8.4 (7.4-9.3) | 51.1 (28.0-74.1) | 85.2 (0.0-170.4) | 0.0 (0.0-0.0) |
| | Unnamed Tributary (954900) to Platte River | Brown trout | 3 | 0.0 (0.0-0.0) | 45.6 (0.0-93.0) | 21.5 (0.0-58.1) | 0.0 (0.0-0.0) |
| | Bull Branch | Brown trout | 1 | 0.0 | 21.9 | 36.5 | 7.3 |
| | Bacon Branch | Brown trout | 1 | 297.3** | 0.0 | 18.0 | 0.0 |
| Little Platte River | Rountree Branch | Brown trout | 1 | 625.0*** | 32.4 | 78.7 | 4.6 |
| | Unnamed Tributary (946100) to Rountree Branch | Brown trout | 1 | 536.2*** | 0.0 | 14.5 | 0.0 |
| | Little Platte River | Brown trout | 2 | 0.0 (0.0-0.0) | 9.6 (0.0-19.3) | 28.3 (7.5-49.0) | 5.3 (0.0-10.5) |
| | Blockhouse Creek | Brown trout | 3 | 0.0 (0.0-0.0) | 0.0 (0.0-0.0) | 5.0 (1.8-7.6) | 0.0 (0.0-0.0) |
| | Mounds Branch | Brown trout | 1 | 0.0 | 0.0 | 2.1 | 0.0 |
| | Unnamed Tributary (5040505) to Little Platte River | Brook trout | 1 | 177.1** | 20.8 | 0.0 | 0.0 |

** Between 25th-49th percentile = Fair abundance*
*** Between 50th-74th percentile = Good abundance*
**** Between 75th-100th percentile = Excellent abundance*

*Table 7. Summary of coldwater fish index of biotic integrity (IBI) scores in classified Trout Water in the Platte and Little Platte River Watersheds in Grant County, sampled during 2021. Values represent stream specific IBI averages and values in parentheses represent the range of IBI values in each stream.*

| WATERSHED | STREAM | NUMBER OF SURVEYS | COLDWATER IBI |
|---|---|---|---|
| Platte River | Platte River | 3 | 7.5 (0-20) |
| | Lee Branch | 1 | 30.0 |
| | Culver Branch | 1 | 40.0 |
| | McPherson Branch | 3 | 40.0 (20-60) |
| | Austin Branch | 2 | 25.0 (20-30) |
| | Leggett Creek | 4 | 15.0 (10-20) |
| | Newell Creek | 1 | 10.0 |
| | Crow Branch | 3 | 3.3 (0-10) |
| | Martinville Creek | 1 | 30.0 |
| Little Platte River | Little Platte River | 3 | 10.0 (0-20) |
| | Snowden Branch | 3 | 23.3 (10-30) |
| | Rountree Branch | 3 | 33.3 (20-50) |
| | Unnamed Tributary (3000364) to Rountree Branch | 1 | 20.0 |

Table 8. *Summary of the qualitative habitat scores, streamflow and thermal characteristics in the streams of the Platte River and Little Platte River basins. Measured metrics were measured on site, during summer of 2021. Normal summer baseflow and Maximum daily mean water temperature metrics are model estimates describing long-term average streamflow and temperature characteristics. Values represent stream-specific averages and values in parentheses represent the range of values in each stream.*

| WATERSHED | STREAM | HABITAT QUALITY INDEX | MEASURED STREAMFLOW (CFS) | NORMAL SUMMER BASEFLOW (CFS) | MEASURED WATER TEMPERATURE (°F) | MAXIMUM DAILY MEAN WATER TEMPERATURE (°F) |
|---|---|---|---|---|---|---|
| Platte River | Platte River | 55.5 (45.0-65.0) | 7.9 (3.3-14.3) | 7.3 (1.4-14.1) | 67.3 (61.0-73.0) | 71.0 (70.1-72.2) |
| | Lee Branch | 43.0 | 1.2 | 0.8 | 61.9 | 69.1 |
| | Culver Branch | 73.0 | 1.2 | 1.2 | 61.0 | 68.1 |
| | McPherson Branch | 60.0 (38.0-77.0) | 1.2 (0.4-2.4) | 1.6 (1.2-2.0) | 65.9 (60.1-70.4) | 69.3 (68.6-69.6) |
| | Austin Branch | 68.5 (67.0-70.0) | 3.8 (2.8-4.7) | 2.1 (2.0-2.2) | 60.0 (55.0-65.0) | 69.0 (68.9-69.1) |
| | Leggett Creek | 53.7 (35.0-68.0) | 5.4 (1.3-8.2) | 5.4 (1.5-7.8) | 67.7 (64.9-72.5) | 70.4 (69.7-71.0) |
| | Newell Creek | 55.0 | 2.0 | 1.6 | 66.7 | 70.6 |
| | Crow Branch | 56.3 (40.0-67.0) | 3.0 (2.2-3.6) | 3.1 (2.1-3.7) | 59.3 (54.0-64.0) | 69.3 (69.0-69.7) |
| | Martinville Creek | 68.0 | 2.0 | 2.9 | 60.1 | 71.5 |
| Little Platte River | Little Platte River | 46.6 (25-62) | 4.9 (1.4-8.4) | 3.9 (0.5-8.1) | 63.2 (55.9-70.7) | 71.3 (70.9-72.2) |
| | Snowden Branch | 65.6 (58-77) | 5.5 (2.9-10.3) | 2.8 (0.9-6.2) | 65.0 (63.9-67) | 71.2 (70.9-71.6) |
| | Rountree Branch | 70.0 (63-80) | 3.0 (1.9-3.6) | 2.9 (2.2-3.7) | 65.7 (63-70) | 70.4 (70-70.9) |
| | Unnamed Tributary (3000364) To Rountree Branch | 48.0 | 0.1 | 0.1 | 67.0 | 72.3 |

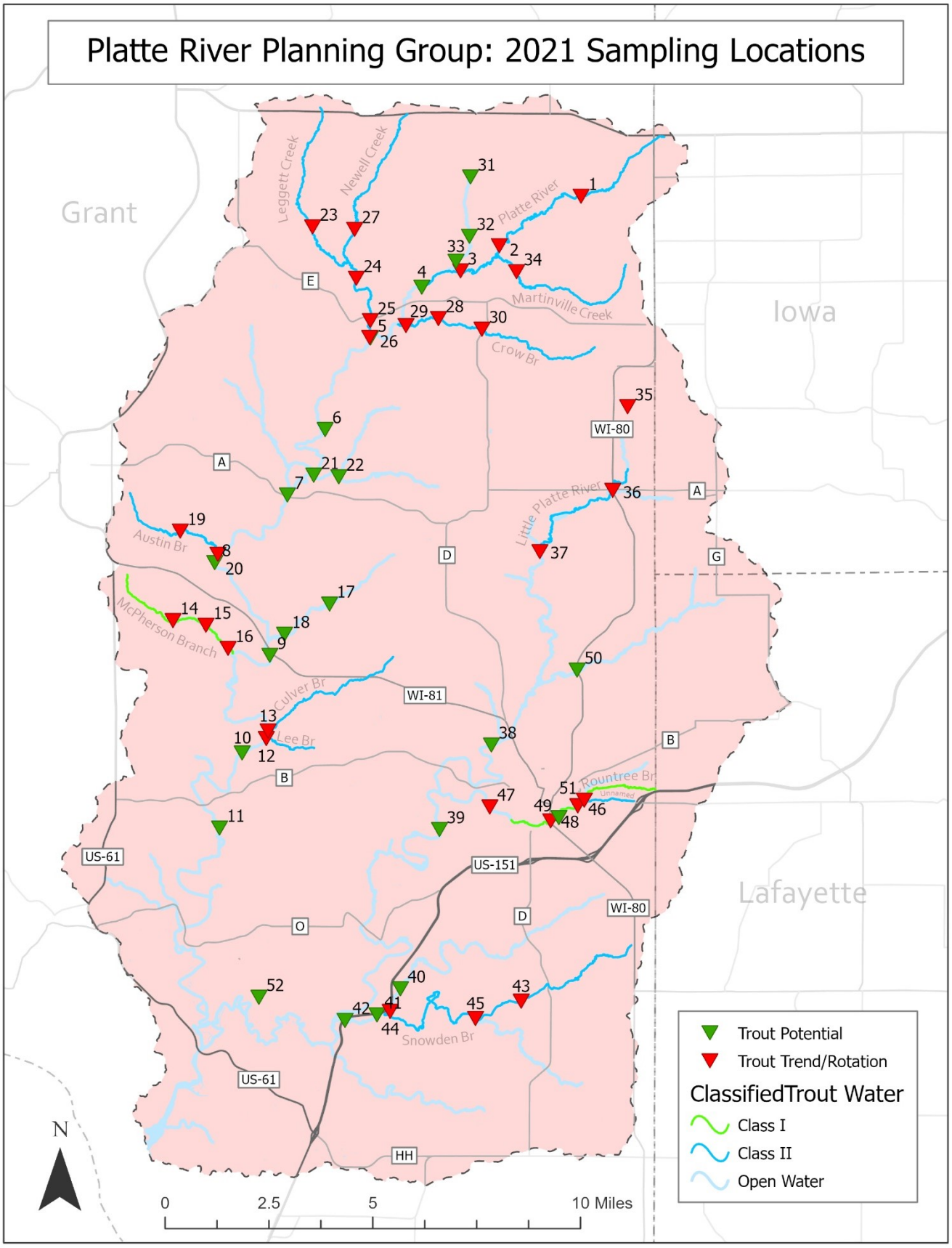


Figure 1. *A map showing the distribution of classified trout water and survey locations for fish and habitat data collection in Platte and Little Platte River Watersheds, during 2021. See Appendix 1 for station number listings.*

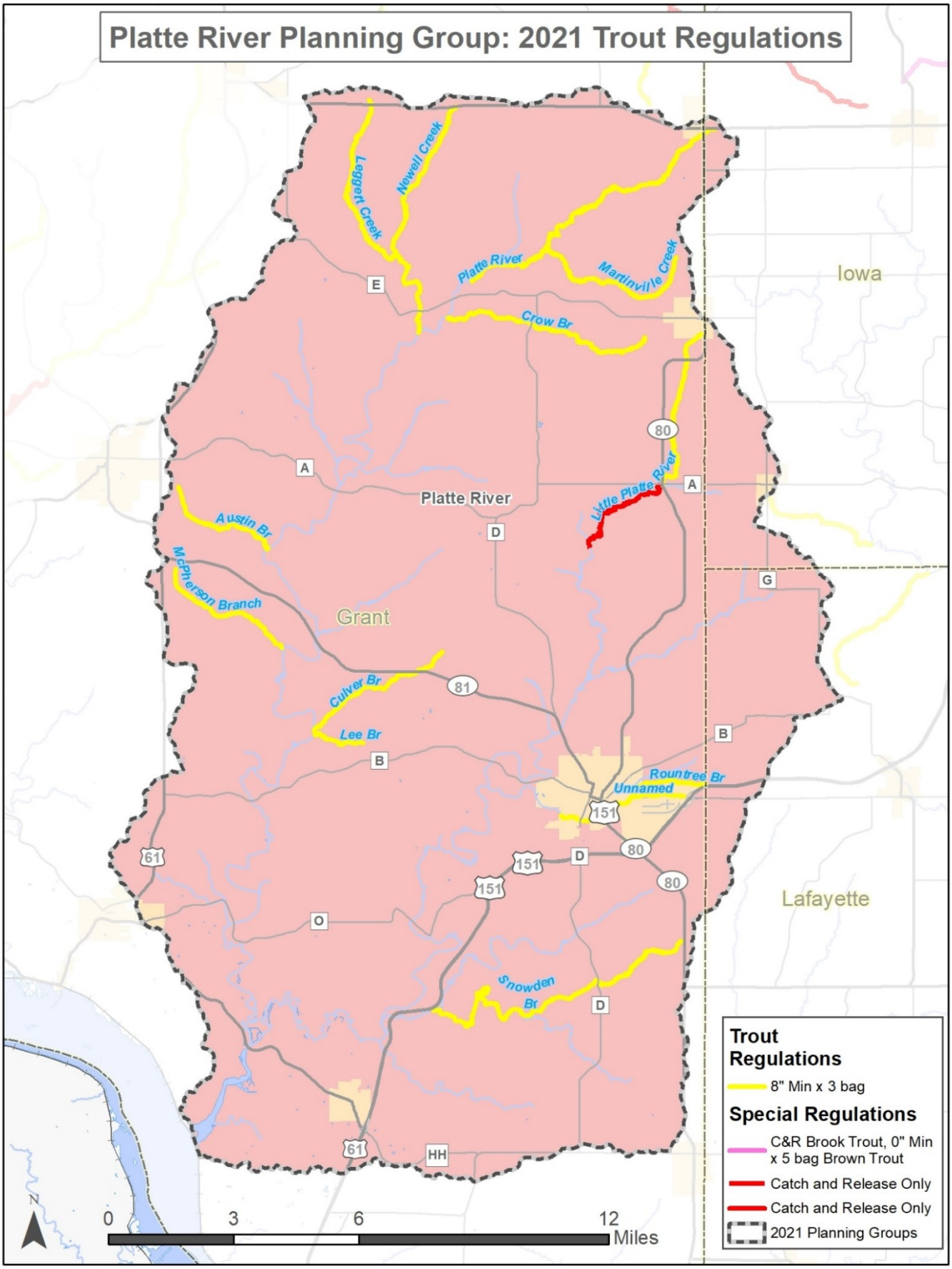


*Figure 2. A map of the current trout fishing regulations implemented in the trout streams of the Platte River and Little Platte River Watershed, as of 2021.*

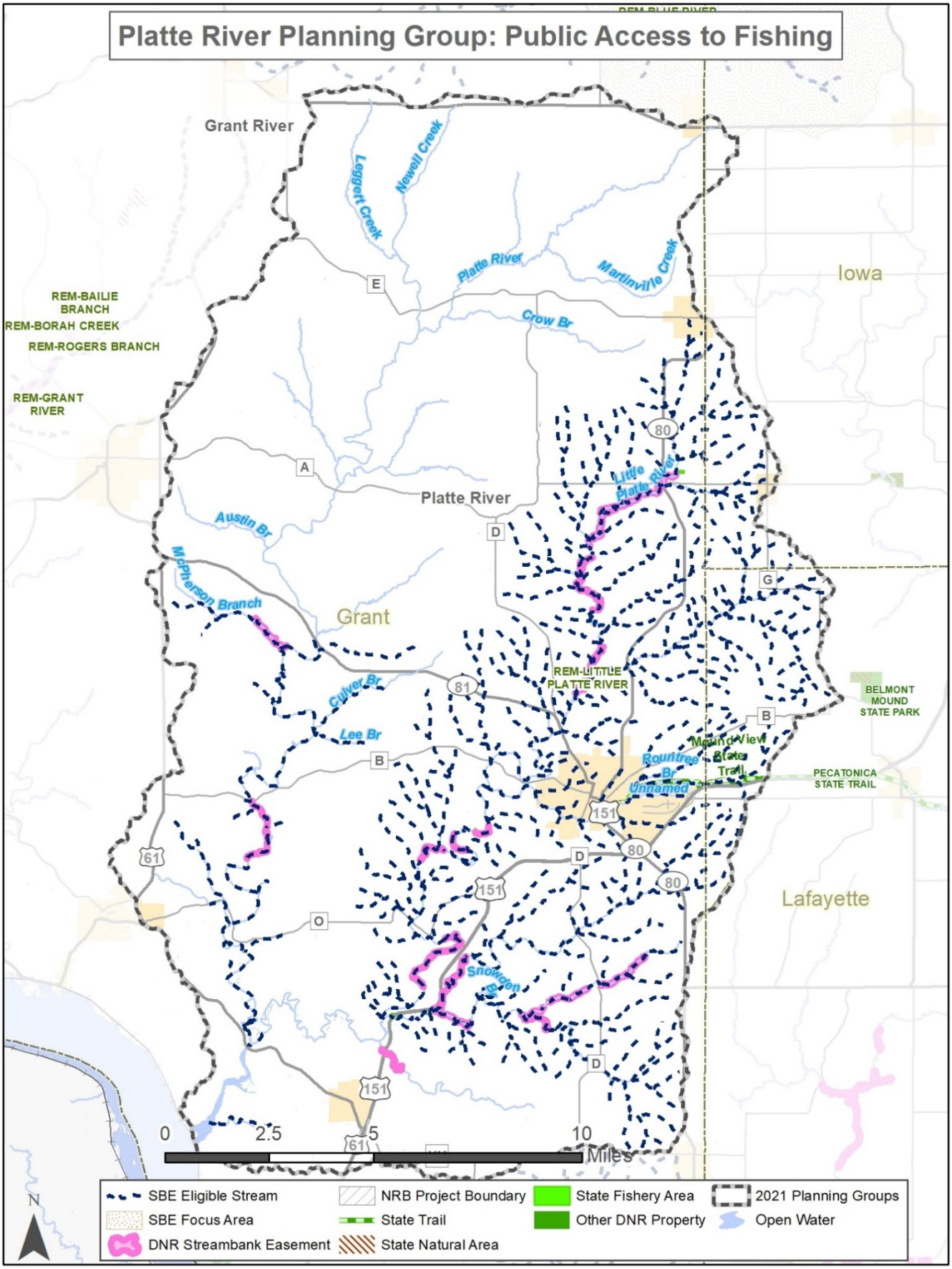


*Figure 3. A map showing public access to trout streams via DNR stream bank easements and eligible easements for acquisition in the Platte River and Little Platte River Watersheds, as of 2021.*

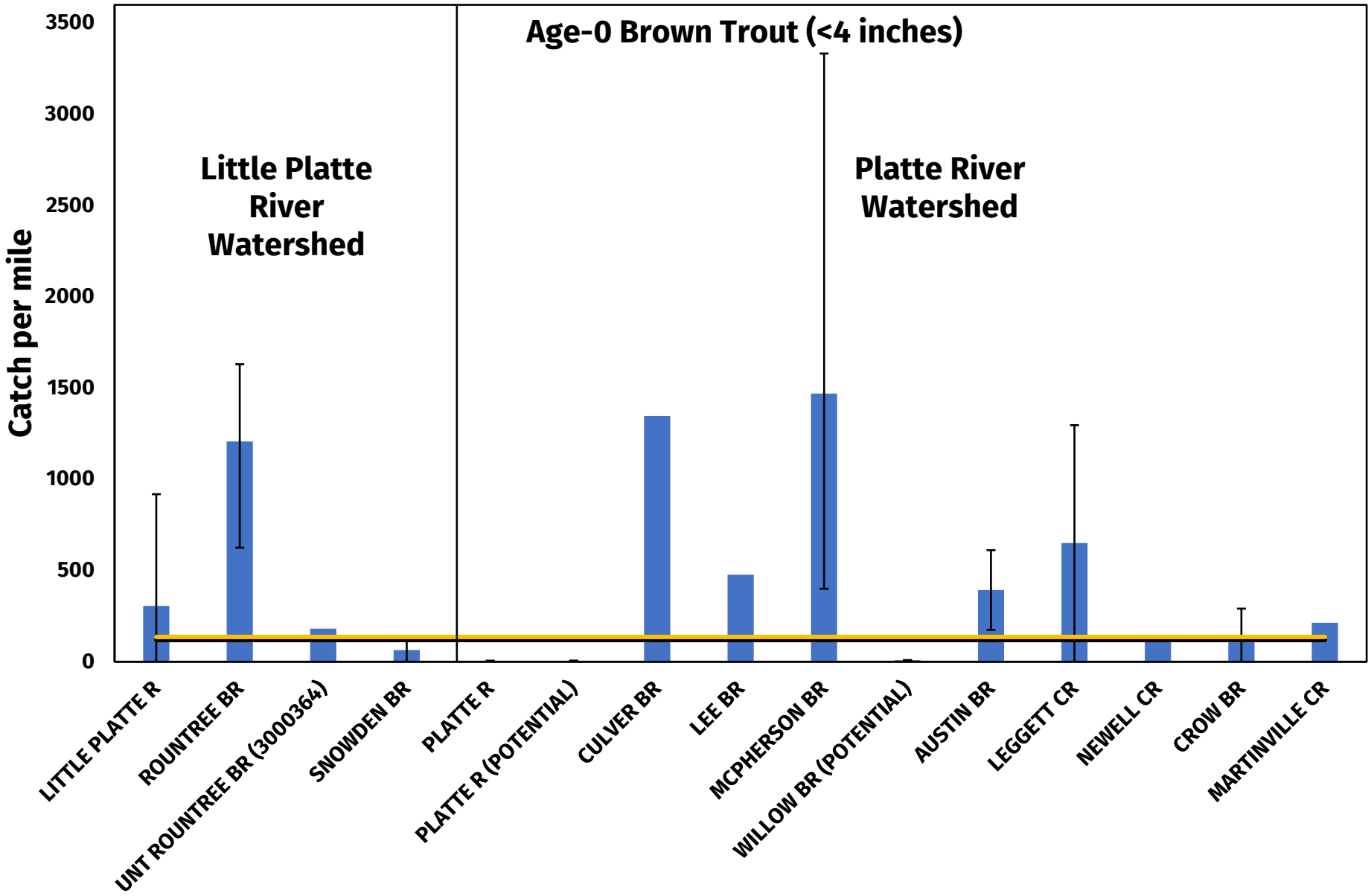


*Figure 4. Catch per unit effort (CPUE) of age-0 Brown trout in the trout streams of the Little Platte River and Platte River Watersheds, surveyed during 2022. This CPUE measures the number Brown trout (<4 inches) caught per mile of electrofishing. The horizontal lines reference the age-0 brown trout CPUE 50$^{th}$ percentile standards for the Driftless Area (orange line) and the State of Wisconsin (black line).*

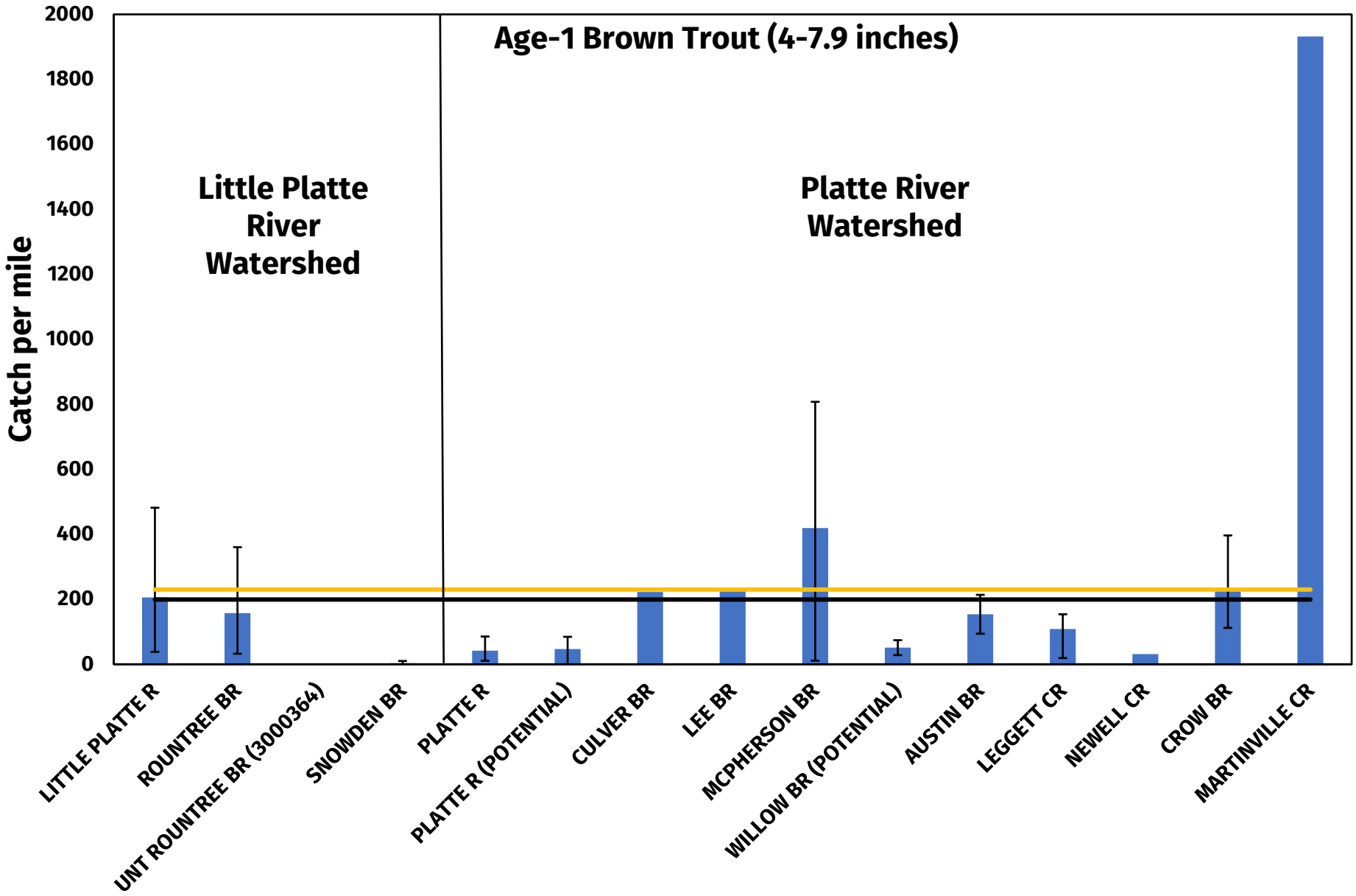


*Figure 5. Catch per unit effort (CPUE) of age-1 Brown Trout in the trout streams of the Little Platte River and Platte River Watersheds, surveyed during 2022. This CPUE measures the number of brown trout (4-7.9 inches) caught per mile of electrofishing. The horizontal lines reference the age-1 brown trout CPUE 50th percentile standards for the Driftless Area (orange line) and the State of Wisconsin (black line).*

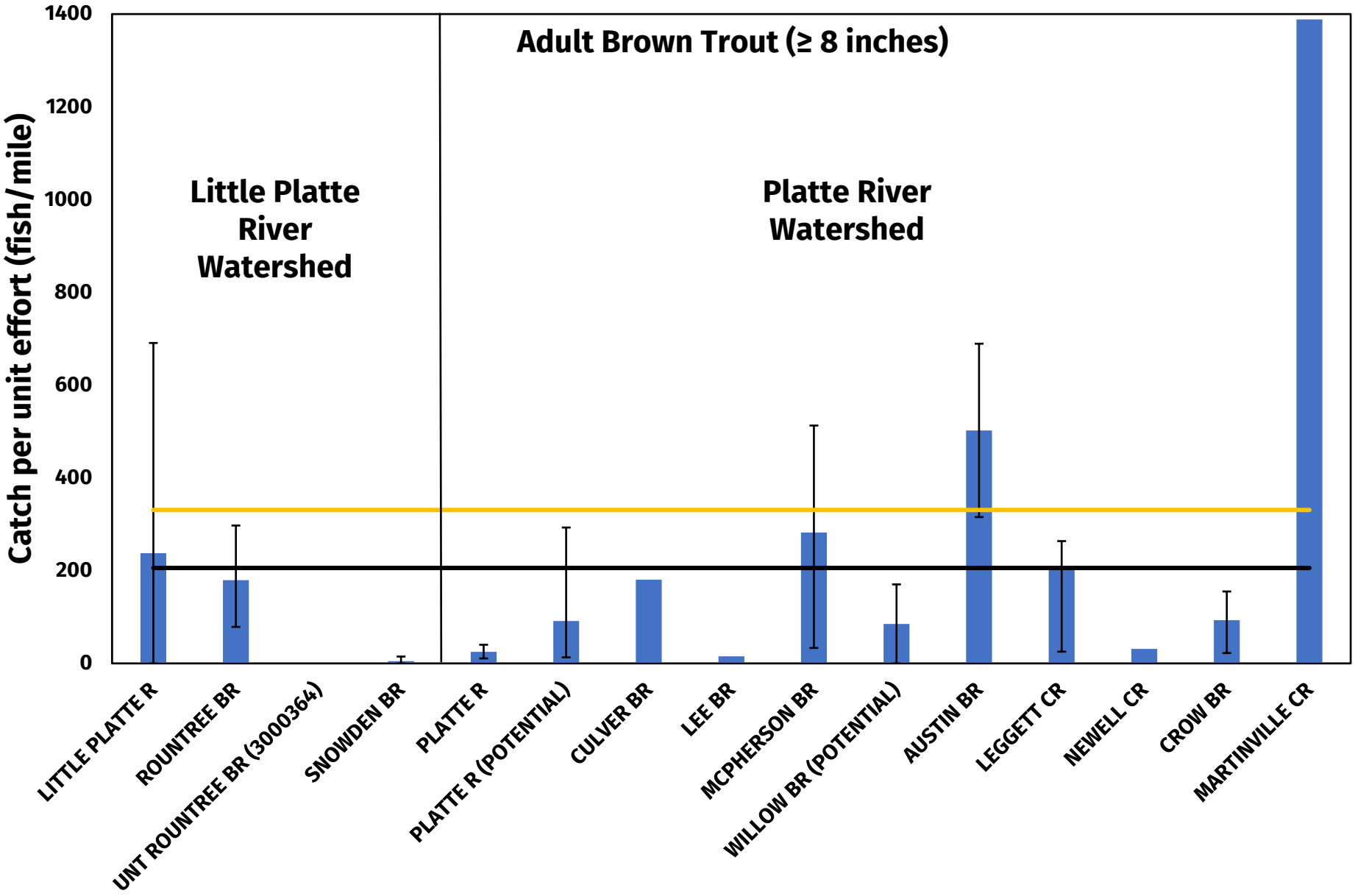


*Figure 6. Catch per unit effort (CPUE) of adult brown trout in the trout streams of the Little Platte River and Platte River Watersheds, surveyed during 2022. This CPUE measures the number of brown trout (≥ 8 inches) caught per mile of electrofishing. The horizontal lines reference the adult brown trout CPUE 50$^{th}$ percentile standards for the Driftless Area (orange line) and the State of Wisconsin (black line).*

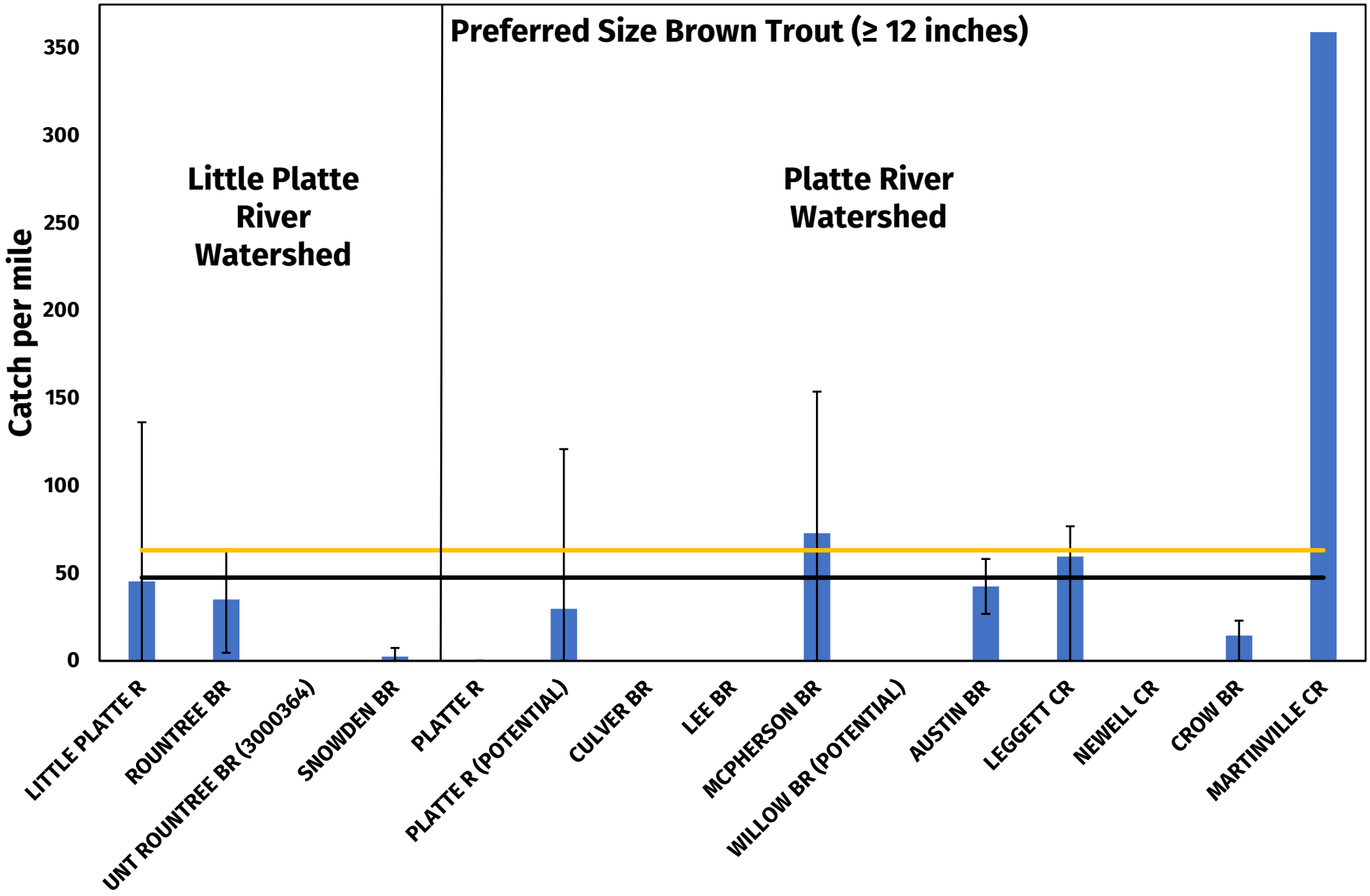


*Figure 7. Catch per unit effort (CPUE) of preferred-size brown in the trout streams of the Little Platte River and Platte River Watersheds, surveyed during 2022. This CPUE measures the number of brown trout (≥ 12 inches) caught per mile of electrofishing. The horizontal lines reference the preferred-size brown trout CPUE 50$^{th}$ percentile standards for the Driftless Area (orange line) and the State of Wisconsin (black line).*

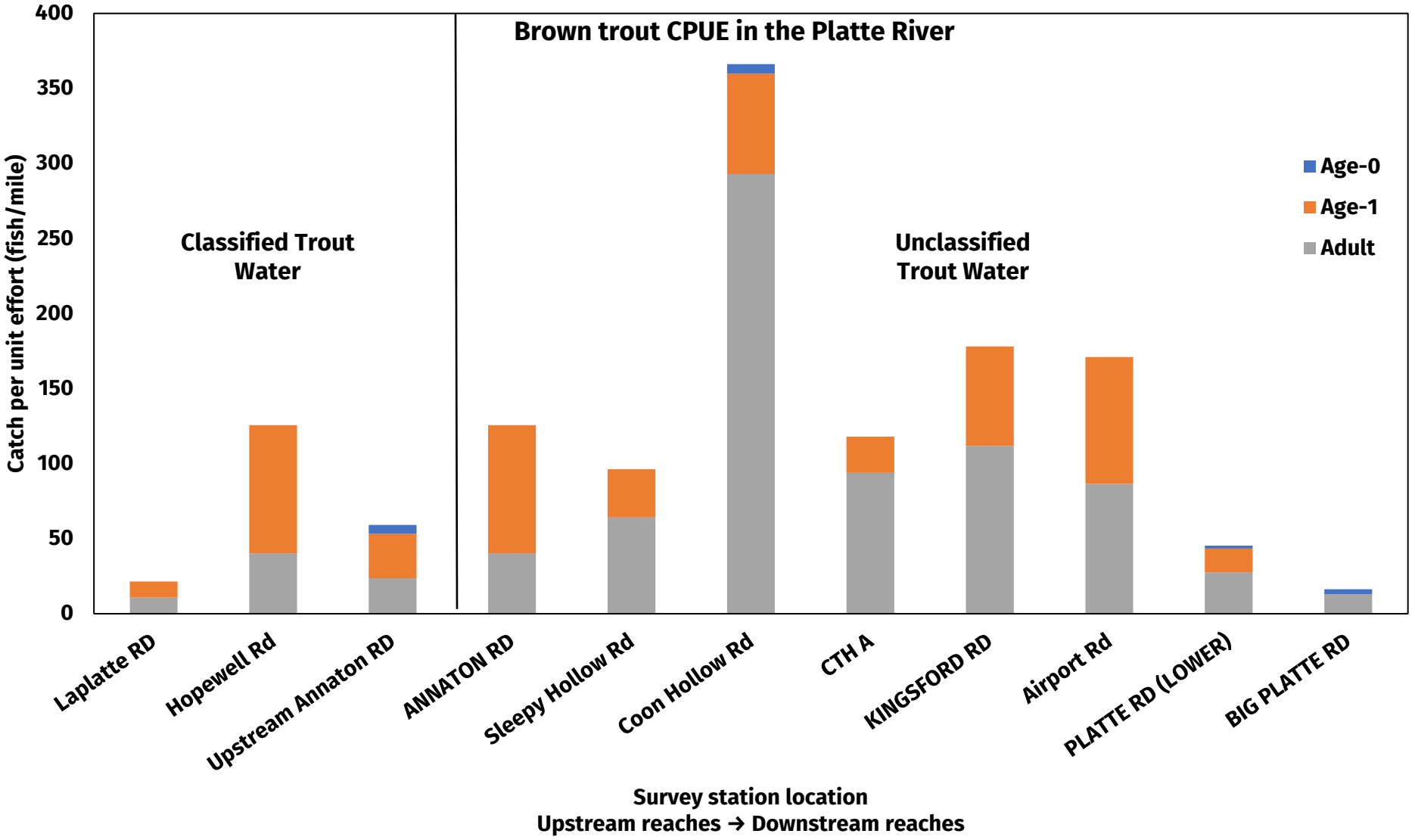


*Figure 8. A plot showing the upstream to downstream variation in age-0, age-1 and adult brown trout catch per unit effort (CPUE) in the classified and unclassified trout water of the Platte River surveyed in 2021.*

# Appendix 1. Sampling locations and station information

| STREAM AND STATION NAME | SITE NUMBER ON MAP | LATITUDE | LONGITUDE | SURVEY TYPE | STREAMFLOW (CFS) | STREAM WIDTH (meters) |
|---|---|---|---|---|---|---|
| PLATTE RIVER - LAPLATTE RD | 1 | 42.9444071 | -90.4629518 | TROUT ROTATION | 3.31914 | 2 |
| PLATTE RIVER - HOPEWELL RD | 2 | 42.9269532 | -90.501617 | TROUT ROTATION | 4.44906 | 3 |
| PLATTTE RIVER - ABOVE ANNATON RD | 3 | 42.9181 | -90.51993 | TROUT ROTATION | 9.5337 | 4.6 |
| PLATTE RIVER - ANNATON RD | 4 | 42.9123217 | -90.5382933 | TROUT POTENTIAL | 14.37117 | 6 |
| PLATTE RIVER - US CONFLUENCE WITH LEGGETT CREEK AT SLEEPY HOLLOW RD | 5 | 42.89443 | -90.56253 | TROUT POTENTIAL | 14.37117 | 6 |
| PLATTE RIVER - SITE 2 US COONHOLLOW RD | 6 | 42.862392 | -90.5837 | TROUT POTENTIAL | 34.14477 | 9.9 |
| PLATTE RIVER - CTH A | 7 | 42.83947 | -90.60138 | TROUT POTENTIAL | 41.03022 | 15 |
| PLATTE RIVER - KINGSFORD RD | 8 | 42.815666 | -90.63559 | TROUT POTENTIAL | 66.80652 | 18 |
| PLATTE RIVER - AIRPORT RD BRIDGE | 9 | 42.7834407 | -90.6091594 | TROUT POTENTIAL | 62.03967 | 16 |
| PLATTE RIVER - PLATTE RD (LOWER CROSSING) | 10 | 42.7492924 | -90.6219298 | TROUT POTENTIAL | 68.1483 | 19 |
| PLATTE RIVER - RIVER ST #1 | 11 | 42.72304 | -90.63239 | TROUT POTENTIAL | 80.5068 | 20 |
| LEE CREEK - US PLATTE RIVER CONFLUENCE | 12 | 42.7543868 | -90.6105441 | TROUT ROTATION | 1.27116 | 2.5 |
| CULVER BRANCH -BASELINE (ATBAKER FORD RD) | 13 | 42.75705 | -90.60974 | TROUT ROTATION | 1.27116 | 3 |
| MCPHERSON BRANCH - US CONFLUENCE OF UNNAMED TRIB | 14 | 42.795307 | -90.65515 | TROUT ROTATION | 0.49434 | 2 |
| MCPHERSON BRANCH - STATION 2 | 15 | 42.793785 | -90.6395 | TROUT ROTATION | 0.95337 | 3 |
| MCPHERSON BRANCH - AIRPORT RD | 16 | 42.7857551 | -90.6289532 | TROUT ROTATION | 2.40108 | 3 |
| WILLOW BRANCH - END OF KROENING LN | 17 | 42.8015075 | -90.5810155 | TROUT POTENTIAL | 2.64825 | 4 |

| STREAM AND STATION NAME | SITE NUMBER ON MAP | LATITUDE | LONGITUDE | SURVEY TYPE | STREAMFLOW (CFS) | STREAM WIDTH (meters) |
|---|---|---|---|---|---|---|
| WILLOW BRANCH - CANNON RD | 18 | 42.79086 | -90.60228 | TROUT POTENTIAL | | 3.0 |
| AUSTIN BRANCH - 1.75 MILES US OF PLATTE RIVER CONFLUENCE | 19 | 42.8265717 | -90.6520278 | TROUT ROTATION | 2.8248 | 4 |
| AUSTIN BRANCH - US OF MOUTH | 20 | 42.818584 | -90.63411 | TROUT ROTATION | 4.69623 | 4 |
| BULL BRANCH - AT MEIER LN | 21 | 42.84644 | -90.58894 | TROUT POTENTIAL | 2.2 | 4 |
| BACON BRANCH - BACON BRANCH REMAP 190-B | 22 | 42.845917 | -90.57707 | TROUT POTENTIAL | | 4 |
| LEGGETT CREEK - GRANDVIEW RD | 23 | 42.93309 | -90.59033 | TROUT ROTATION | 1.37709 | 3 |
| LEGGETT BRANCH - ROCK SCHOOL RD | 24 | 42.915264 | -90.56941 | TROUT ROTATION | 6.42642 | 6 |
| LEGGETT CREEK - 175M DOWNSTREAM OF CTH E | 25 | 42.90052 | -90.56261 | TROUT ROTATION | | 4.5 |
| LEGGETT CREEK - US CONFLUENCE WITH PLATTE RIVER AT SLEEPY HOLLOW RD | 26 | 42.89468 | -90.56291 | TROUT ROTATION | 8.29785 | 7 |
| NEWELL CREEK - GRANDVIEW RD. | 27 | 42.932346 | -90.570366 | TROUT ROTATION | 2.04798 | 4 |
| CROW BRANCH - DS 2109 CTH E PRIVATE STREAM CROSSING | 28 | 42.90139 | -90.53031 | TROUT ROTATION | 3.35445 | 4.6 |
| CROW BRANCH - PINE KNOB RD. | 29 | 42.8988873 | -90.5456744 | TROUT ROTATION | 3.56631 | 4.7 |
| CROW BRANCH - CTH D | 30 | 42.897762 | -90.509636 | TROUT ROTATION | 2.22453 | 1.7 |
| UNNAMED TRIB (WBIC 954900) - EBENEZER RD | 31 | 42.95091 | -90.51551 | TROUT POTENTIAL | 1.4124 | 2 |
| UNNAMED TRIB TO PLATTE - (ATMILL DAM RD) | 32 | 42.93017 | -90.51583 | TROUT POTENTIAL | 4.09596 | 3 |
| UNNAMED TRIB (WBIC 954900) TO PLATTE RIVER - EAST OF MILL DAM RD | 33 | 42.9214177 | -90.5221567 | TROUT POTENTIAL | 4.2372 | 4 |
| MARTINVILLE CREEK - US CONFLUENCE | 34 | 42.91792 | -90.49336 | TROUT ROTATION | 2.01267 | 3.5 |
| LITTLE PLATTE RIVER - UPS. NEW CALIFORNIA RD. | 35 | 42.8709828 | -90.4403108 | TROUT ROTATION | 1.37709 | 2 |

| STREAM AND STATION NAME | SITE NUMBER ON MAP | LATITUDE | LONGITUDE | SURVEY TYPE | STREAMFLOW (CFS) | STREAM WIDTH (meters) |
|---|---|---|---|---|---|---|
| LITTLE PLATTE RIVER - STH 80 S11 | 36 | 42.8417734 | -90.4471644 | TROUT ROTATION | 4.9434 | 4 |
| LITTLE PLATTE RIVER - WATERFALL ROAD | 37 | 42.82024 | -90.481544 | TROUT ROTATION | 8.40378 | 7 |
| LITTLE PLATTE RIVER - RIVER ST #1 | 38 | 42.75267 | -90.503975 | TROUT POTENTIAL | 16.45446 | 8 |
| LITTLE PLATTE RIVER - NEAR PLATTEVILLE WI | 39 | 42.7230511 | -90.5282978 | TROUT POTENTIAL | 30.15474 | 18.7 |
| BLOCKHOUSE CREEK - AIRPORT RD BRIDGE | 40 | 42.667336 | -90.5463 | TROUT POTENTIAL | 7.3 | 6 |
| BLOCKHOUSE CREEK - SMALLMOUTH BASS SITE | 41 | 42.65819 | -90.557274 | TROUT POTENTIAL | 21.8 | 8 |
| BLOCKHOUSE CREEK - BLOCKHOUSE CREEK 1, 50 METERS UPSTREAM OF OLD 151 BRIDGE | 42 | 42.656185 | -90.57238 | TROUT POTENTIAL | 16.06 | 9.3 |
| SNOWDEN BRANCH - ROCK RD BRIDGE | 43 | 42.6632702 | -90.4891527 | TROUT ROTATION | 2.96604 | 3.3 |
| SNOWDEN BRANCH - BLOCKHOUSE CONFLUENCE | 44 | 42.659424 | -90.55107 | TROUT ROTATION | 10.31052 | 3.5 |
| SNOWDEN BRANCH - 60 M UPSTREAM FROM JUNCTION WITH FRENCH CREEK | 45 | 42.657127 | -90.51072 | TROUT ROTATION | 3.24852 | 3.5 |
| ROUNTREE BRANCH - STATION 3 | 46 | 42.731586 | -90.46292 | TROUT ROTATION | 3.35445 | 5 |
| ROUNTREE BRANCH - UW PLATTEVILLE PARK RN03 | 47 | 42.731006 | -90.5045425 | TROUT ROTATION | 3.63693 | 7.5 |
| ROUNTREE BRANCH - HWY 80 BRIDGE | 48 | 42.7263 | -90.47569 | TROUT ROTATION | 1.90674 | 2.7 |
| UNT TO ROUNTREE BRANCH (946100) | 49 | 42.7274334 | -90.4718217 | TROUT POTENTIAL | 0.77682 | 1.1 |
| MOUNDS BRANCH - STH 80 | 50 | 42.7789796 | -90.4636019 | TROUT POTENTIAL | 6.7 | 5.5 |
| UNNAMED TRIB (3000364) TO ROUNTREE BR | 51 | 42.7335756 | -90.4598473 | TROUT ROTATION | 0.1 | 0.5 |
| UNNAMED TRIB (5040505) TO LITTLE PLATTE RIVER - OAK RD | 52 | 42.6640408 | -90.613164 | TROUT POTENTIAL | 1.23585 | 2.1 |

# Appendix 2. Trout population characteristics by survey station (CPUE=catch per unit effort, number per mile)

| STREAM AND STATION NAME | SITE NUMBER ON MAP | SPECIES | NUMBER FISH | AGE-0 CPUE | AGE-1 CPUE | ADULT CPUE | PREFERRED SIZE CPUE |
|---|---|---|---|---|---|---|---|
| PLATTE RIVER - LAPLATTE RD | 1 | BROWN | 2 | 0.0 | 10.8 | 10.8 | 0.0 |
| PLATTE RIVER - HOPEWELL RD. | 2 | BROWN | 11 | 13.2 | 32.9 | 26.3 | 0.0 |
| PLATTTE RIVER - ABOVE ANNATON RD | 3 | BROWN | 10 | 5.9 | 29.6 | 23.7 | 0.0 |
| PLATTE RIVER - ANNATON RD | 4 | BROWN | 25 | 0.0 | 85.4 | 40.2 | 0.0 |
| PLATTE RIVER - US CONFLUENCE WITH LEGGETT CREEK AT SLEEPY HOLLOW RD | 5 | BROWN | 18 | 0.0 | 32.1 | 64.2 | 26.7 |
| PLATTE RIVER - SITE 2 US COONHOLLOW RD | 6 | BROWN | 115 | 6.4 | 66.9 | 293.0 | 121.0 |
| PLATTE RIVER - CTH A | 7 | BROWN | 44 | 0.0 | 24.1 | 93.8 | 29.5 |
| PLATTE RIVER - KINGSFORD RD. | 8 | BROWN | 78 | 0.0 | 66.2 | 111.9 | 29.7 |
| PLATTE RIVER - AIRPORT RD BRIDGE | 9 | BROWN | 85 | 0.0 | 84.5 | 86.5 | 18.1 |
| PLATTE RIVER - PLATTE RD (LOWER CROSSING) | 10 | BROWN | 23 | 2.0 | 15.8 | 27.6 | 11.8 |
| PLATTE - RIVER ST #1 | 11 | BROWN | 10 | 3.3 | 0.0 | 13.1 | 1.6 |
| LEE CREEK - US PLATTE RIVER CONFLUENCE | 12 | BROWN | 47 | 476.9 | 230.8 | 15.4 | 0.0 |
| CULVER BRANCH BASELINE - BAKER FORD RD | 13 | BROWN | 126 | 1347.2 | 222.2 | 180.6 | 0.0 |
| MCPHERSON BRANCH - US CONFLUENCE OF UNNAMED TRIB | 14 | BROWN | 40 | 400.0 | 11.1 | 33.3 | 0.0 |
| MCPHERSON BRANCH STATION 2 | 15 | BROWN | 174 | 569.1 | 439.0 | 300.8 | 65.0 |
| MCPHERSON BRANCH - AIRPORT RD | 16 | BROWN | 363 | 641.0 | 807.7 | 512.8 | 153.8 |
| WILLOW BRANCH - END OF KROENING LN | 17 | BROWN | 34 | 7.4 | 74.1 | 170.4 | 0.0 |
| WILLOW BRANCH - CANNON RD | 18 | BROWN | 4 | 9.3 | 28.0 | 0.0 | 0.0 |
| AUSTIN BRANCH - 1.75 MILES US OF PLATTE RIVER CONFLUENCE | 19 | BROWN | 156 | 611.7 | 213.6 | 689.3 | 58.3 |
| AUSTIN BRANCH AT MOUTH | 20 | BROWN | 87 | 174.5 | 94.0 | 315.4 | 26.8 |
| BULL BRANCH - ATMEIER LN | 21 | BROWN | 8 | 0.0 | 21.9 | 36.5 | 7.3 |
| BACON BRANCH - BACON BRANCH REMAP 190-B | 22 | BROWN | 35 | 297.3 | 0.0 | 18.0 | 0.0 |
| LEGGETT CREEK - GRANDVIEW RD | 23 | BROWN | 156 | 296.7 | 153.8 | 263.7 | 76.9 |
| LEGGETT BRANCH - ROCK SCHOOL RD | 24 | BROWN | 41 | 5.3 | 63.5 | 148.1 | 42.3 |
| LEGGETT CREEK - 175M DOWNSTREAM OF CTH E | 25 | BROWN | 7 | 0.0 | 19.0 | 25.3 | 0.0 |
| LEGGETT CREEK - US CONFLUENCE WITH PLATTE RIVER AT SLEEPY HOLLOW RD | 26 | BROWN | 28 | 0.0 | 51.7 | 109.2 | 11.5 |

| STREAM AND STATION NAME | SITE NUMBER ON MAP | SPECIES | NUMBER FISH | AGE-0 CPUE | AGE-1 CPUE | ADULT CPUE | PREFERRED SIZE CPUE |
|---|---|---|---|---|---|---|---|
| NEWELL CREEK - GRANDVIEW RD. | 27 | BROWN | 19 | 135.4 | 31.3 | 31.3 | 0.0 |
| CROW BRANCH - DS 2109 CTH E PRIVATE STREAM CROSSING | 28 | BROWN | 101 | 28.7 | 396.6 | 155.2 | 23.0 |
| CROW BRANCH - PINE KNOB RD | 29 | BROWN | 53 | 0.0 | 168.4 | 102.0 | 20.4 |
| CROW BRANCH - CTH D | 30 | BROWN | 57 | 291.0 | 111.9 | 22.4 | 0.0 |
| UNNAMED TRIB (WBIC 954900) - EBENEZER RD | 31 | BROWN | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| UNNAMED TRIB TO PLATTE - ATMILL DAM RD | 32 | BROWN | 13 | 0.0 | 93.0 | 58.1 | 0.0 |
| UNNAMED TRIB (WBIC 954900) TO PLATTE RIVER - EAST OF MILL DAM RD | 33 | BROWN | 8 | 0.0 | 43.8 | 6.3 | 0.0 |
| MARTINVILLE CREEK - US CONFLUENCE | 34 | BROWN | 364 | 213.6 | 1932.0 | 1388.3 | 359.2 |
| LITTLE PLATTE RIVER - US NEW CALIFORNIA RD. | 35 | BROWN | 6 | 0.0 | 96.8 | 0.0 | 0.0 |
| LITTLE PLATTE RIVER - STH 80 S11 | 36 | BROWN | 230 | 463.6 | 481.8 | 690.9 | 136.4 |
| LITTLE PLATTE RIVER - WATERFALL ROAD | 37 | BROWN | 11 | 0.0 | 38.3 | 21.9 | 0.0 |
| LITTLE PLATTE RIVER - RIVER ST. #1 | 38 | BROWN | 39 | 0.0 | 19.3 | 49.0 | 10.5 |
| LITTLE PLATTE RIVER - NEAR PLATTEVILLE WI | 39 | BROWN | 4 | 0.0 | 0.0 | 7.5 | 0.0 |
| BLOCKHOUSE CREEK - US AIRPORT RD. BRIDGE | 40 | BROWN | 3 | 0.0 | 0.0 | 5.5 | 0.0 |
| BLOCKHOUSE CREEK - SMALLMOUTH BASS SITE | 41 | BROWN | 4 | 0.0 | 0.0 | 7.6 | 0.0 |
| BLOCKHOUSE CREEK - BLOCKHOUSE CREEK 1, US OF OLD 151 BRIDGE | 42 | BROWN | 1 | 0.0 | 0.0 | 1.8 | 0.0 |
| SNOWDEN BRANCH - ROCK RD BRIDGE | 43 | BROWN | 14 | 132.7 | 10.2 | 0.0 | 0.0 |
| SNOWDEN BRANCH - US BLOCKHOUSE CONFLUENCE | 44 | BROWN | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SNOWDEN BRANCH - 60 M UPSTREAM FROM JUNCTION WITH FRENCH CREEK | 45 | BROWN | 10 | 59.3 | 0.0 | 14.8 | 7.4 |
| ROUNTREE BRANCH - STATION 3 | 46 | BROWN | 254 | 1630.6 | 360.4 | 297.3 | 63.1 |
| ROUNTREE BRANCH - UW PLATTEVILLE PARK RN03 | 47 | BROWN | 159 | 625.0 | 32.4 | 78.7 | 4.6 |
| ROUNTREE BRANCH - HWY 80 BRIDGE | 48 | BROWN | 386 | 1366.7 | 79.2 | 162.5 | 37.5 |
| UNT TO ROUNTREE BRANCH (946100) | 49 | BROWN | 38 | 536.2 | 0.0 | 14.5 | 0.0 |
| MOUNDS BRANCH - STH 80 | 50 | BROWN | 1 | 0.0 | 0.0 | 2.1 | 0.0 |
| UNNAMED TRIB (3000364) TO ROUNTREE BR | 51 | BROWN | 4 | 181.8 | 0.0 | 0.0 | 0.0 |
| UNNAMED TRIB (5040505) TO LITTLE PLATTE RIVER - OAK RD | 52 | BROOK | 19 | 177.1 | 20.8 | 0.0 | 0.0 |