WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Trout Stream Management and Status Report of the Sugar River Watershed

Dane and Green Counties, Wisconsin 2020-2021

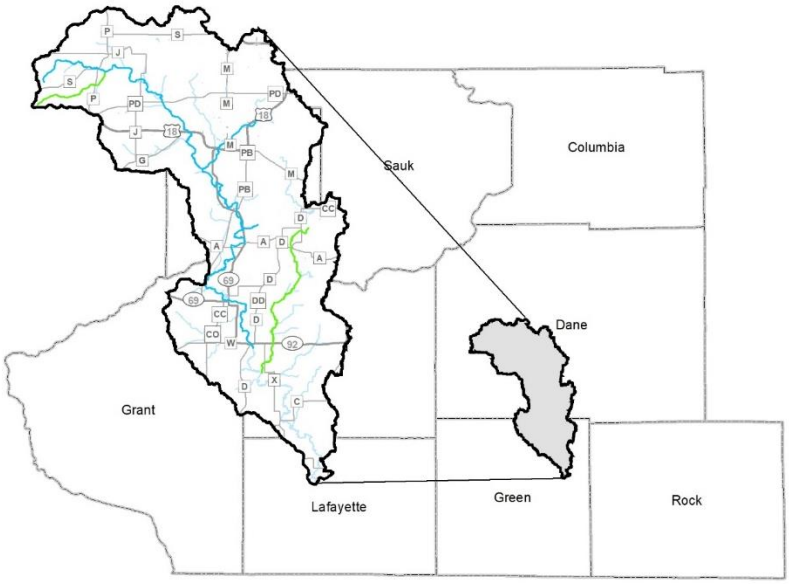

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Table of Contents

Executive Summary

The Sugar River watershed is located on the west side of the Madison metropolitan area and contains six trout streams. The Sugar River is a Class 2 trout stream but hasn't been stocked regularly. Story Creek and Schlapbach Creek are Class 1 trout streams and have been stocked with Brook Trout in the past. Badger Mill Creek has changed from a warm water stream, stocked with put-and-take trout, into a Class 2 trout stream that receives fingerling Brown Trout. There is good public access to the Sugar River, Badger Mill and Story Creek through DNR and Dane County owned lands.

We sampled the Sugar River watershed using single pass stream electrofishing following the suspension of stocking to assess natural recruitment and natural reproduction. We found fishable populations and evidence of low to moderate recruitment but inconsistent abundances throughout the Sugar River. We documented abundant Brown Trout and high natural recruitment in Story Creek but a low abundance of Brook Trout in the absence of stocking. Henry and Gill Creek had trout, but in low abundances, while Schlapbach Creek had a healthy, self-sustaining Brook Trout population.

Schlapbach Creek and Story Creek are appropriately classified as Class 1 trout waters, but Story Creek is likely changing to Brown Trout dominance since Brook Trout stocking was stopped in 2016. Other streams in the watershed are appropriately classified as Class 2 trout waters. The DNR will continue stocking Badger Mill Creek and begin stocking Sugar River to increase adult trout abundances. Gill Creek should be classified as Class 2 trout waters, but the DNR will not invest in expensive stocking programs here due to limited public access.

Reproduction and recruitment of trout are limited by degraded habitats trout need at all life stages within the Sugar River watershed and its tributaries but can be improved with investments in stream bank and trout habitat improvement projects. With improved habitat and healthier riparian corridors, we can expect trout recruitment to increase, thereby increasing adult abundances as conditions improve. With abundant springs and cold water throughout the majority of the watershed, this system has the potential to become a destination fishery in several reaches.

The major threat to the watershed is a reduction of cold water inputs to the trout streams, groundwater depletion, increased runoff and wetland disturbance as the watershed is increasingly more developed in the fastest-growing county in the state.

Management recommendations outlined in this report include: stocking large fingerling Brown Trout in Sugar River and continuing stocking efforts within Badger Mill Creek to increase adult abundances, conducting trout habitat improvement projects along publicly owned lands within the Sugar River watershed to increase reproduction and natural recruitment, continuing to stock large fingerling Brook

Trout in Story Creek, reclassifying Gill Creek as a Class 2 trout water during the 2024 reclassification cycle, and no changes to the fishing regulations are recommended at this time.

ACKNOWLEDGEMENTS

Data collection for the 2020 and 2021 surveys were completed by DNR staff Andrew Notbohm, Jim Amrhein, Camille Bruhn, Kim Kuber, Samantha Brose, David Rowe and Dan Oele. Bryce Linden contributed watershed maps. David Rowe and Tim Simonson provided feedback and edits for this report.

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WATERSHED LOCATION

Sugar River Watershed, Dane and Green counties including Sugar River, Story Creek, Badger Mill Creek, Henry Creek, Schlapbach Creek, Gill Creek and an unnamed tributary of Sugar River.

PURPOSE OF SURVEY

DNR baseline trout rotation and trout potential surveys
Assess trout stream classification
Assess natural reproduction and recruitment
Assess current trout population abundance

DATES OF FIELDWORK

June 15, 2021 – Sept. 2, 2021 (Sugar River, Story Creek, Badger Mill Creek, Gill Creek, unnamed tributary of Sugar River)

July 30, 2020 -Sept. 18, 2020 (Henry Creek and Schlapbach Creek)

FISH SPECIES OBSERVED IN THE SURVEY

All fish encountered were collected and recorded including American Brook Lamprey, Banded Darter, Black Bullhead, Black Crappie, Blackside Darter, Bluegill, Bluntnose Minnow, Brook Stickleback, Brook Trout, Brown Trout, Central Mudminnow, Channel Catfish, Common Carp, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Golden Redhorse, Golden Shiner, Green Sunfish, Hornyhead Chub, Johnny Darter, Lake Chubsucker, Largemouth Bass, Mississippi Silvery Minnow, Mottled Sculpin, Northern Hogsucker, Northern Pike, Orangespotted Sunfish, Pumpkinseed, Quillback, Rainbow Trout, Rock Bass, Sand Shiner, Shorthead Redhorse, Silver Redhorse and Smallmouth Bass.

Introduction

SUMMARY OF THE WATERSHED

The Class 2 trout water within the Sugar River is defined as the waters extending downstream past HWY 92 south of Belleville upstream to the headwaters near the town of Springdale northeast of Mount Horeb in Dane County. The Sugar River and two of its tributaries, Schlapbach and Story Creek, are designated DNR Exceptional Resource waters, indicating these rivers provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat and have good water quality. However, the Sugar River is considered impaired due to elevated total phosphorus levels.

From the headwaters, the Sugar River flows southeast towards Verona, through Paoli and Belleville, with numerous road crossings and public lands in between. Schlapbach Creek originates in a subdivision within Mount Horeb and flows east along the Military State Trail before meeting the Sugar River downstream of Klevenville Riley Road. The small unnamed tributary detailed in this report was surveyed at the Sugar River road crossing near Marshview Road. This creek flows west along HWY G and intersects HWY J. Badger Mill Creek originates in the city of Madison and flows south through Verona, where it gains flow in various springs and wetlands before continuing south to join the Sugar River near Riverside Road within Dane County owned lands. Henry Creek is a small, cold water tributary of the Sugar and originates in a wetland complex east of HWY 69 and joins the Sugar River within Dane County lands within the Basco Unit south of the town of Paoli. Story Creek originates in a large wetland complex north of HWY A in the town of Oregon and flows south through the DNR Brooklyn Wildlife Area and joins the Sugar River south of the town of Exeter near HWY X. Gill Creek begins north of HWY 92 and flows southwest towards Exeter where it meets the Sugar near the HWY X road crossing.

In urbanized and rapidly developing areas like Sugar River and Badger Mill Creek watersheds, two core conservation principles to try to adhere to when balancing development and maintaining healthy trout streams are: protect and maintain groundwater function as it relates to temperature and flow regimens and maintain buffers between wild riparian lands near the bank edge and the encroaching development. Large springs from the confluence of Badger Mill upstream to HWY 18 provide baseflow and supply the cold water trout need to thrive in the lower reaches of the creek. Upstream from there, development pressures have modified the channel morphology, springs and wetlands in the area, and the creek's baseflow is supplemented by Madison Metropolitan Sewage District (MMSD) treated effluent.

Recognizing the importance of urban recreational opportunities and the potential for Badger Mill Creek as a trout stream, DNR, Southern Wisconsin Trout Unlimited, Dane County and the City of Verona developed stream improvement practices in coordination with sewer line upgrades along the creek between Main Street upstream

towards HWY PB. While sewer upgrades were underway, crews also installed brush bundles, rock weirs and root wads to improve the channel morphology and increase overhead cover for trout. Future surveys will assess the impact stocking and habitat improvements have made on increasing trout abundances in this area.

The Sugar River watershed encompasses 217 square miles with 66% agriculture, 17% grasslands, 7% forested and 10% other. With the exception of Story Creek, with extensive DNR lands surrounding it, the land use practices and watershed characteristics are similar among all the streams we surveyed. The majority of the watershed is dominated by agriculture, with relatively few reaches of stream with high-quality, undisturbed riparian corridors.

CURRENT STATUS

Class 1 trout streams are those with high-quality habitat with sufficient levels of natural reproduction to sustain the fishery, and no stocking is required. Class 2 streams are those in which some natural reproduction occurs but not enough to utilize all available food and space, and stocking is required to maintain a desirable fishery. Class 3 streams are those in which trout habitat is marginal with no natural reproduction occurring and requires stocking of catchable-sized trout to provide a fishing opportunity. Schlapbach Creek and Story Creek are Class 1 fisheries, whereas the Sugar River, Henry Creek and Badger Mill Creek are Class 2. The tributary to Sugar River and Gill Creek are unclassified trout waters and were surveyed as trout potential sites (Figure 2).

Badger Mill was stocked with yearling Brown Trout from 1988-2014 to provide a put-and-take fishery. MMSD started to discharge treated wastewater to the stream in 1998 to compensate for decreasing baseflows in Badger Mill and the Sugar River resulting from municipal well withdrawals and lower groundwater and stream flows. The discharge increased the baseflow by roughly 35%. Badger Mill Creek was reclassified in 2008 as a Class 2 trout stream, as was Sugar River. Electrofishing surveys documented natural reproduction and recruitment of Brown Trout in both streams, but the fisheries biologists at the time felt that there was more available habitat and stocking could improve the abundance of the fishery. Strangely, after the reclassification, Badger Mill Creek continued to be stocked with yearling Brown Trout until 2014, when the quota was switched to more appropriate large fingerlings to supplement natural recruitment. The Sugar River, despite being classified as a Class 2 stream, did not receive any stocked trout, with the exception of surplus small fingerling Rainbow Trout from Nevin Hatchery starting in 2017.

Story Creek was stocked regularly with Brook Trout until 2016 and was a Class 2 stream until it was reclassed in 2020 as a Class 1 stream. Brook Trout stocking was suspended due to its recent upgrade to Class 1 status, and the DNR determined the brood source in Ash Creek was actually compromised with domestic ancestry. The

department didn't want to stock those mixed ancestry genetics on top of natural reproduction. Since then, the department has conducted a genetic analysis that shows the population already is moderately introgressed with domestic genetics.

Henry Creek and Schlapbach Creeks were stocked with Brook Trout from 2004 -2016. Schlapbach Creek has flourished into a Class 1 trout stream, but Henry Creek has not responded as positively and remains a Class 2 stream.

The entire Sugar River watershed is regulated under the standard county-wide 8 inch minimum, three daily bag limit for trout (Figure 2).

PUBLIC ACCESS

The largest swaths of DNR-owned lands in this area are along Story Creek, which lies within the Brooklyn Wildlife area near the Dane and Green County border near HWY 92. Public access is excellent in this area, with ten designated parking areas and several additional road-stream crossings. The Sugar River State Natural Area and Military Ridge Trail system offer users access to the Upper Sugar River within state-owned properties. Dane County owns additional lands along the Sugar River, offering parking and angler access further downstream in the Falk-Wells Wildlife Area and Basco Unit Wildlife area as well as numerous road crossings. Schlapbach, Henry Creek and Gill Creek do not have any public access lands or easements except for right-of-way access at road-stream crossings.

Trout stamp-funded habitat improvement projects have occurred along the Sugar River at the Dane County Basco Unit (Dane County and Trout Unlimited also provided funds) and at Story Creek near Bellbrook Road. The DNR has installed lunker structures, silt traps and bank stabilization and conducted bank sloping in the Brooklyn Wildlife Area upstream of the Alpine Road parking lots and improved the hydrology of the river with ditch filling near Bellbrook Road.

Methods

Understanding the natural reproduction capacity and recruitment of a stream is critical to managing trout populations. In our fishery assessments, natural recruitment is defined by juvenile fish surviving to age-1. Natural reproduction is the presence of age-0 fish (young-of-year, YOY), and they are difficult to accurately assess since their vulnerability to electrofishing gear is more variable than larger-sized fish. Additionally, young-of-year fish are not evenly distributed since they often occur upstream in nursery habitats and migrate downstream to adult and juvenile habitats later in life. Therefore, documenting the lack of natural reproduction does not mean there is necessarily a complete lack of natural recruitment.

To assess recruitment to age-1, all fingerling trout stocking was suspended the year prior to these surveys. Our assumption was that all yearling (age-1) trout are from natural recruitment somewhere in the watershed and all YOY (age-0) trout are from

natural reproduction. If any previous stocking occurred, age-2 and older fish are assumed to be from mixed sources. High levels of natural reproduction, natural recruitment and several age classes without stocking are indicative of self-sustaining Class 1 waters. We infer that put-and-grow stocking was effective if we observe an absence or low abundance of yearling trout but an abundance of adult trout and conclude a given stream should be classified as Class 2. Waters where stocked trout survive only during early spring and summer with limited carry-over and no reproduction are Class 3.

COVID-19 safety precautions limited our fieldwork in 2020 and impacted our scheduled workload in 2021. For this report, I used 2020 data for Schlapbach Creek and Henry Creek; all other data are from 2021 surveys. We surveyed three stations in Badger Mill Creek, two in Gill Creek, two in Henry Creek, four in Schlapbach Creek, four in Story Creek, nine in the Sugar River and one in the unnamed tributary to Sugar River (see Figure 1 for a map of sample locations). All 25 stream sites were surveyed with either a tow behind barge stream shocking unit or backpack electrofishing unit.

The number of fish sampling sites in a particular stream was dependent on the stream segment length following DNR Fish Management Handbook protocols. One sampling site is required for stream segments less than 1.5 miles, two sites for stream segments 1.5-3 miles and one site every three miles on long rivers (minimum of three sites). The length of each fish survey at a particular site is determined by stream width; thirty-five times the mean stream width on segments greater than 3 meters and 100 meters minimum for streams less than 3 meters wide.

For each sampling site, we calculated the catch-per-unit-effort (CPUE) by dividing the number of fish collected by the length of the survey yielding a number of trout per mile estimate. This procedure allows for straightforward analyses of catch rates within and among stream sites as well as standardized regional and statewide comparisons. Fish length data are analyzed by size classes and age groups of interest. These groups include the number of age-0 (YOY), age-1 (yearlings) and age-2+ (adult trout). YOY are fish less than 4 inches in length, yearlings are between 4 and 7.9 inches for Brown Trout (between 4 and 7 inches for Brook Trout), and adults are considered greater than 8 inches for Brown Trout (>7 inches for Brook Trout). Preferred-sized fish are often of special interest to anglers and are fish greater than 12 inches for Brown Trout (>10 inches for Brook Trout).

All fish encountered during the survey were collected. We recorded the species of fish and total length (to the nearest tenth of an inch). Non-trout species are counted to calculate a cold water index of biotic integrity (IBI) score (0-100). For added context, catch rates of Mottled Sculpin (less tolerant of poor water quality and a cold water indicator species) and White Sucker (tolerant of poor water quality and warmer water) were also evaluated as a proxy for water temperature profiles at each survey

station. The DNR Fisheries Management Handbook Chapter 510 details each of the sampling protocols in greater detail. All fish were returned to the stream.

Water quality and habitat metrics were collected at each survey site. Streamflow (cubic feet per second, cfs) was calculated at one cross-sectional transect at each site using a HACH FH950 handheld flow meter. Temperature, dissolved oxygen, specific conductivity and pH were measured using a handheld YSI Pro 2030 meter. Stream habitat metrics were recorded using a DNR qualitative habitat rating form. For streams less than 10 meters wide, ratings included riparian buffer width, bank erosion, pool area, width: depth ratio, riffle: riffle or bend: bend ratio, fine sediments and cover for fish. For streams greater than 10 meters wide, ratings included bank stability, maximum thalweg depth, riffle: riffle or bend: bend ratio, rocky substrate and cover for fish. All data was recorded digitally using weatherproof handheld Toughbook™ laptops and a custom software application.

Results

SUMMARY

Brown Trout were collected in 22 of the 25 sites we sampled (Table 2), and average catch rates for YOY Brown Trout (<4 inches) was 122 per mile, yearlings (4-8 inches) were 127 per mile, adults (>8 inches) were 201 per mile, preferred-sized trout (>12 inches) were 46 per mile and fish size ranged from 2 to21 inches. YOY Brown Trout (natural reproduction) were observed in 20 locations (Figure 4). Yearling Brown Trout (4-8 inches) were observed in 19 locations (Figure 5), and larger size classes of Brown Trout (>8”) were observed at 19 sites (Table 2).

Brook Trout were observed in Gill Creek, Schlapbach Creek, Story Creek and Henry Creek (Table 3). Schlapbach Creek had the highest catch rates for Brook Trout, with mean catch rates of YOY at 35 per mile, yearlings at 113 per mile and adults at 94 per mile. The upper two stations near the headwaters had the most fish and multiple year classes represented in the sample.

YOY Brown Trout catch rates across the watershed were generally low, and only Story Creek had average YOY catch rates exceeding the statewide median (Figure 4). The most YOY were collected at the HWY 92 station on Story Creek, followed by the Story Creek Circle Wildlife Area station and Valley Road in the Sugar River. Most stations produced low abundances of YOY, and only one station had zero YOY recruits (excluding zeros for YOY Brown Trout in Brook Trout dominant Schlapbach, Table 2).

Yearling catch rates for Brown Trout across the watershed followed a similar pattern as YOY, and only Story Creek had average yearling catch rates, which exceeded the statewide median (Figure 5). The highest catch rates for yearling Brown Trout were at HWY 92 in Story Creek, followed by Bruce Company Bridge in the Sugar River. Nearly

all other stations had at least some yearling recruitment, and only three stations recorded zero yearlings for Brown Trout (Table 2).

For adult Brown Trout (>8 inches), Story Creek and Badger Mill Creek had catch rates exceeding the statewide median (with Sugar River close to that benchmark), but only Story Creek exceeded the driftless median benchmark (Figure 6). The highest catch rates of adult Brown Trout >8 inches were found at HWY 92, HWY X and Alpine Road stations in Story Creek, followed by Bruce Company Bridge in the Sugar River. Henry Creek, Gill Creek and the unnamed tributary to the Sugar River all contained very low adult trout abundances (Table 2).

For fish larger than 12 inches, only Story Creek and Sugar River had average catch rates that met or exceeded the statewide benchmark (Figure 7). The highest catch rates of adult Brown Trout >12 inches were found at HWY X, Story Creek Circle Wildlife Area and Alpine Road in Story Creek, followed by Bruce Company Bridge and Bobcat Lane stations in the Sugar River. All other catch rates were < 65 per mile for this size class (Table 2). See Table 6 and Table 7 for a detailed summary of regional and statewide benchmarks for Brook and Brown Trout.

Brook Trout were observed in four streams, but only the upper two stations in Schlapbach Creek can be considered a viable fishing opportunity for Brook Trout at this time. In Schlapbach Creek, mean catch rates for Brook Trout met or exceeded driftless rates for all size classes except YOY. Only two stations produced YOY in modest amounts and were below the driftless median benchmark. The highest abundances of Brook Trout were found at Town Hall Road (611 per mile) and Sletto Road (321 per mile). The highest catch rates of the largest fish were found at Sletto Road (Table 3).

The presence of cold water indicator species like Mottled Sculpin throughout much of the watershed (and low trout abundances) indicate the stream temperatures are suitable and water quality sufficient to support increased trout abundances with habitat improvements. Mottled Sculpin were observed throughout the watershed in all seven streams. The highest abundances were in Schlapbach and Henry creeks, followed by Badger Mill Creek and Sugar River. White Suckers were observed in most of the watershed, with the highest abundances in the lower reaches of the Sugar River and Story Creek but were less abundant in Schlapbach Creek, Gill Creek and Henry Creek (Table 5).

COLD WATER INDEX OF BIOTIC INTEGRITY SCORES AND HABITAT QUALITY

The median cold water IBI score across all sites in the Sugar River watershed was 68 (out of 100) and exceeded the statewide trout stream (60), Driftless Area trout stream (50) and Dane County (50) median scores. Average qualitative habitat ratings for the watershed was 56 (out of 100) with all stations scoring as “Excellent,” “Good” or “Fair,” with one “Poor” score (the unnamed tributary to Sugar River). Average riparian

buffer scores were excellent (13 out of 15). Bank erosion scores varied widely, and nearly all stations had some erosion issues (range 0-15 out of 15). Adequate pool area habitat was rare, with a median score of 3 and a max score of 7 (out of 15). Median scores for other physical habitat metrics showed similar heterogeneous patterns, including width: depth ratio (5 out of 15), riffle habitat (10 out of 15), fine sediments present (5 out of 15) and cover for fish (10 out of 15). The average temperature across all stations was 62.7° F (ranged from 53 to 71). The average stream flow was 21.4 cfs (ranged from 1.8 to 55 cfs), with an average width of 8.2 meters (Table 4).

SUGAR RIVER

The highest trout abundances in the Sugar River were found at the HWY PB station (579 per mile), but the other two stations were well below statewide benchmarks (Table 2). The middle reaches of the Sugar River had the highest catch rates of adult Brown Trout (e.g., Valley Road at 293 trout per mile and Bruce Company Bridge at 407 per mile), but all the survey stations had adult trout abundances above the minimal fishable population (50 per mile) and offer angling opportunities throughout this section of the river. The Valley Road station had the healthiest trout population with multiple year classes present and catch rates that exceeded regional benchmarks for YOY, yearling, adult and preferred-size classes (Table 2). The average catch rate for the lowest reaches of the Sugar River sampled was 279 per mile, and none of the stations exceeded the Driftless Area median benchmarks (one of them exceeded statewide marks).

The quality, amount and types of habitat available for trout varied throughout the Sugar River watershed, and trout abundances reflected heterogeneity in available trout habitat. For example, Brown Trout catch rates fluctuated between high and low catches from below the Belleville Dam upstream to the headwaters in Klevenville. Belleville Dam catch rates were 416 per mile, one station upstream at Frenchtown Road, 142 per mile, and further upstream at Bruce Company property, 766 per mile. This pattern of alternating high-low catch rates was repeated throughout the length of the survey stations indicating habitat and physical characteristics of the river likely mediated trout abundances (Table 2).

Only two Brook Trout were observed in the Sugar River at the Valley Road station indicating the abiotic conditions needed for Brook Trout to persist are lacking. Despite surplus stocking of small fingerling Rainbow Trout, only three rainbows were observed in the survey.

The unnamed tributary of the Sugar River that we surveyed had adequate flow and suitable temperature to support trout, but the substrate was dominated by thick layers of silt and the channel was ditched, greatly limiting the trout potential in this reach. However, we did observe a single YOY Brown Trout here, indicating trout had tried to utilize the area for spawning and some reproduction may occur here. Habitat

improvements to narrow the stream, enhance scouring and woody habitat additions may boost the trout population in this small tributary.

SCHLAPBACH CREEK

Schlapbach Creek stood out in this survey with high catch rates of Brook Trout, which have so far kept the Brown Trout from invading (only one observed). Town Hall Road boasted the highest catch rates of Brook Trout (611 per mile) and had YOY, yearling and adult size classes represented in the survey. The stream channel is incised and suffers from areas of bank erosion, but the cold water, wooded riparian corridor and good flow with deep bend pools offer Brook Trout a rare opportunity to persist and provide a unique angling opportunity.

BADGER MILL CREEK

We surveyed three stations within Badger Mill Creek, including upstream of the confluence with the Sugar River, at HWY 69 Bridge and upstream of Bruce Street. HWY 69 and Bruce Street catch rates were comparable (>400 trout per mile), while the station near the confluence had 225 trout per mile. YOY and yearling production lagged behind regional benchmarks, but larger-sized fish were more abundant (Table 2, Figure 4-7).

HENRY CREEK

Henry Creek is a very small spring-fed tributary to the Sugar River and flows west from a spring complex south of Paoli and meets the Sugar River within the Dane County Basco Unit lands. We surveyed two stations relatively near one another at the only locations we could gain access to. One station was at the HWY 69 crossing, and the other upstream of the nearby railroad bridge crossing. The relatively small, shallow stream produced similar results at each location, modest YOY and yearling catch rates and very low (or absent) abundances of larger classes of Brown Trout (Table 2).

STORY CREEK

With above average habitat scores, diverse stream channel morphology, cold stream temperatures and good IBI scores, Story Creek had the highest quality trout waters in the watershed (Tables 2 & 4). For example, the HWY 92 station contained the highest total catch rates across all size classes. The YOY catch rates here (1643 per mile) were greater than the YOY catch rates for all other sites in the watershed combined. The other three stations were among the highest five catch rates across the rest of the watershed. The HWY 92 and HWY X stations had the highest abundance of 12-inch and 18-inch fish in the watershed (Table 2). Story Creek was the only trout stream in this watershed to outperform regional Driftless Area and statewide benchmarks across all size classes (Figure 4-7).

Story Creek at Alpine Road and HWY 92 are two DNR annual trend sites. These reaches have been surveyed regularly since the early 2000s (Figure 8-9). The Alpine

Road station has experienced shifts in Brown and Brook Trout dominance coinciding with stocking practices (Table 1, Figure 8). For example, stocking Brook Trout in 2015-2016 produced a fishery dominated by Brook Trout, but in the absence of stocking, Brown Trout have since become dominant by a wide margin (Figure 8). At HWY 92, Brown Trout had been stable, with minor fluctuations between 800-1200 Brown Trout per mile. The 2021 survey revealed a drastic increase in trout abundances, punctuated by a strong YOY Brown Trout year class (Figure 9).

GILL CREEK

Although unclassified trout water, the DNR surveyed this tributary of Sugar River due to its proximity to Story Creek and a history of a remnant trout population. In the two stations we surveyed, very few trout were captured (13 total), none over 12 inches (Table 2-3) with limited YOY and yearling survival (Figure 4-5). Both survey locations suffered from heavy siltation, bank erosion and incision and generally lacked cover for trout. Surprisingly, the headwaters near Freidig Road revealed a remnant Brook Trout population persisting in low abundance (Table 3), indicating the trout potential in this area may warrant closer examination and increased resources to improve the habitat and fishery.

Discussion

The majority of stream reaches within the Sugar River, Badger Mill Creek and Henry Creek are performing as Class 2 fisheries. They provide Minimal Fishable populations, and anglers can expect to catch trout in these areas (e.g., survey reaches contained >50 adult trout per mile). These streams have isolated reaches of spawning and YOY nursery habitat but are not substantial enough to populate the entire system with yearling or adult trout that would be able to fully utilize the available food and space. Evidence for this occurrence is clear in reviewing natural YOY and yearling recruitment catch rates within the watershed. For example, Brown Trout YOY recruitment was low; only one station exceeded the statewide median catch rates (Sugar River at Valley Road). Similarly, for yearling recruitment, only two locations had catch rates above statewide median rates (Table 2).

Currently, Class 1 trout waters, Schlapbach (Brook Trout) and Story Creek (mixed fishery, dominated by Brown Trout), are high in abundance across all size classes and indicate healthy self-sustaining fisheries in these waters, which provide the highest quality angling experiences among the streams we surveyed. Within Story Creek, we observed the highest abundances of trout in the watershed, and average catch rates across all four stations exceeded the statewide and Driftless Area median CPUE for all size classes (Figure 4-7). Though tight casting windows around brush and downed wood can be challenging for some anglers, others enjoy the unique remote feel of the property, and anglers can be confident plenty of trout are lurking in these waters.

Schlapbach Creek offers a relatively new and unique angling experience for Brook Trout in Dane County. DNR Brook Trout stocking efforts in 2015-2016 (Table 1) have produced a self-sustaining Brook Trout population, and as a result, the stream was recently classified as Class 1 trout water. Though the habitat and physical characteristics of the stream could use improvement, standard streambank improvement and habitat projects seeking to stabilize banks and improve aesthetics could promote Brown Trout in the system at the expense of the existing Brook Trout fishery. Work should focus on maintaining the riparian shade and cover for Brook Trout with riffle-run-pool complexes. Current DNR guidance precludes stream bank acquisition or fee title acquisition along this stream, but efforts should be made to protect and maintain groundwater sources, riparian buffers and water quality of this unique fishery. Though currently along privately held lands, when and if DNR easements or acquisition guidance can be modified, and assuming current landowners are agreeable, future stream bank easements and or fee title acquisitions could result in DNR-led initiatives to improve the habitat and enhance the Brook Trout fishery in Schlapbach Creek.

Gill Creek and Henry Creek do not currently provide reliable angling opportunities. Though Henry Creek was stocked in 2015, those Brook Trout have not resulted in a robust recreational fishery in this stream, nor have trout from the Sugar River migrated into Henry Creek (likely due to the steep grade of the HWY 69 crossing). Gill Creek has the temperature profile to support increased abundances of trout, but the habitat is severely degraded and largely inaccessible and unfishable. The stream channel is choked with silt and too wide, but trout are persisting, even Brook Trout in the headwaters.

With 200 trout per mile, Gill Creek should be upgraded from unclassified trout water to Class 2 as it has moderate levels of natural reproduction and yearling recruitment but not enough to fully utilize the available food and space. Low trout abundances should not minimize the importance of these types of tributaries as a vital groundwater protection area or their potential to improve with targeted habitat improvements and improved land use practices. Well-buffered, cold springs and small streams like Henry Creek, Gill Creek and other small tributaries (e.g., unnamed tributary to Sugar River in this report) and their wetland complexes ensure cold, high-quality water inputs to the classified trout waters nearby and should be enhanced and protected.

At the other end of the stream order spectrum, the lower reaches of the main-stem Sugar River do not have high enough trout abundances to warrant upgrading to Class 1 trout waters but do serve as an important overwinter ground for trout. River reaches like these are important habitats that trout seek as water temperatures decrease in winter. At this time, trout will migrate to lower reaches in search of warmer, deeper waters (buffered from cold surface air temps by groundwater) to overwinter and conserve energy. Areas like these can be overlooked but serve an

important role in structuring healthy trout fisheries and offer excellent fishing opportunities during the early catch and release seasons.

In contrast to decreased trout catch rates subsequent to regional flooding in 2018 (e.g., Black Earth Creek and Blue Mounds Watershed assessments in 2019), the 2020 and 2021 data presented here indicate that post-flood conditions have resulted in increased trout production and year class formation in some locations. For example, Story Creek had stations with YOY production and yearling recruitment values well above regional benchmarks. Story Creek's catch rate of YOY Brown Trout at HWY 92 was 11.5 times greater than the Driftless Area benchmark. However, Sugar River (except one station at Valley Road) and Badger Mill Creek did not experience dramatic increases in YOY production. Future surveys will examine whether or not freshly scoured spawning riffles and modified stream morphology will continue to produce strong year classes, whether or not contemporary elevated YOY production leads to increased adult trout abundances for anglers to target and if lag-effects of increased scouring will lead to YOY production in places like Sugar River and Badger Mill that so far have not experienced increases that we have seen in other area streams.

Fishery assessments at the Story Creek trend stations clearly show the influence of regular Brook Trout stocking prior to 2016 which produced a fishery that was dominated by Brook Trout over Brown Trout by greater than a 2:1 margin in the years following stocking (Figure 8). However, when stocking ceased, Brown Trout slowly began to increase abundances to the point where the Brook Trout population crashed in 2019, and the 2021 survey showed Brown Trout outnumbered Brook Trout by a 9:1 margin. In addition to relying on stocking to support the population, the discovery of gill lice, a non-native parasite that damages gill filaments and can lead to fish death, has been documented in Story Creek. In an effort to restore the Brook Trout population, the DNR is undertaking a Brook Trout stocking program on selected waters that have a) a history of Brook Trout, b) genetic analyses indicate the strain of established Brook Trout populations is from domestic strains or out of basin strains from historical stocking events. Future large fingerling Brook Trout stocking planned for 2021-2026 in Story Creek has a twofold goal of increasing Brook Trout abundances and evaluating changes in genetic profiles after stocking native Wisconsin feral strains.

Though anglers have reported catching a few of the surplus small fingerling Rainbow Trout that have been stocked in Sugar River over the years, the survival of these fish is very low. Only a dozen rainbows ranging in size from 9-14 inches showed up in our surveys in 2020 and 2021. Despite being stocked into the mainstem Sugar River, rainbows were observed in Henry Creek (1), Schlapbach (1) and Badger Mill creeks (7) in addition to Sugar River (3).

A unique feature of this watershed is the expansive public access comprised of large publicly owned tracts within Dane County and DNR-owned properties, most notably

along the Sugar River, Badger Mill Creek and Story Creek. These properties are easily accessible by a wide variety of users, from anglers, hunters, paddlers, hikers, birders and other outdoor recreators. Balancing priorities as it pertains to in-stream and riparian trout habitat is paramount in the sustainability of cold water aquatic resources. For example, paddlers, anglers and conservation groups need to coordinate riparian management activities in consultation with property owners to ensure safe paddler access and angler passage but leaving ample wood in and near the river, which serves important ecological functions and provides fish habitat while standing (e.g., shade) as well as when it falls into the river (e.g., cover for fish).

Investments in new easements or land acquisitions in areas like Badger Mill Creek, Schlapbach Creek and the headwaters and lower reaches of the Sugar River would be particularly valuable in Dane County, the fastest-growing county in the state. Current public access to these streams is limited compared to the rest of the watershed. Stream bank easements are one of the few tools the DNR has to help encourage and enable public use of the resource. DNR Fisheries Management program, along with Dane County and Southern Wisconsin Trout Unlimited, have invested substantial time and effort in recruiting interested landowners to enroll in a stream bank easement program. We encourage any interested landowners to reach out to their local fisheries biologist (contact info on the first page of this report for Dane County) if they have any interest or want to learn about the DNR Stream Bank Easement Program (https://dnr.wi.gov/topic/fishing/streambank/). Priority locations for easement acquisitions should include the high-performing areas outlined in this report but are open to any interested landowner. Increased public access with easements or fee title acquisitions are necessary first steps in order to utilize other funding sources to conduct comprehensive stream bank and in-stream trout habitat improvement projects in the watershed. DNR Fisheries Management program will continue to partner with area conservation organizations to advance this important component of fisheries management and public access to fishing grounds as well as engage in the DNR property management process to allow greater flexibility to acquire lands dedicated to fishing access and angler access.

While most of the land within the Story Creek sub-watershed has been maintained in a wooded and wetland state, improved land use practices in adjacent lands will perhaps be the largest governing factor in maintaining or improving trout abundancies in the rest of the Sugar River watershed. The decrease in trout abundances in the YOY and yearling size classes throughout the watershed (except Story Creek) indicate recruitment failures and is indicative of a lack of physical habitat trout need at different stages of their lifecycle. Most of the qualitative habitat metrics we reported need improvement; bank erosion, incision and fine sediment accumulation have led to many stream reaches devoid of pools and width:depth ratios that cannot support healthy numbers of trout. As a result of siltation and sediment transport, many reaches have eroded banks with monotonous runs over sand and silt substrates with fine sediments forming mucky margins of heavy deposition, resulting in stream corridors that are wide, flat and shallow with few

trout. Stream segments like these could be improved by reconnecting the floodplain with bank sloping and stabilization, improving the width:depth ratio to promote deeper runs and pools, and providing habitats for trout at multiple life stages. For example, habitat projects could create adult spawning habitats with increased depth and velocity to form riffles and offer juvenile trout nursery habitat, with vegetated margins of the stream with overhead cover in lower velocity, deeper pools with rootwads and rock weirs.

Protecting and improving groundwater and natural riverine processes associated with flow and temperature profiles are important components of healthy trout fisheries. The agricultural history in Brooklyn Wildlife Area along Story Creek has left many diversions, straightened channels and shallow braided channels resulting in monotonous stream habitats. To improve the habitat and hydrology here, the DNR has conducted ditch filling, wetland restoration and expanded buffers along Story Creek near Bellbrook Road. There are several braided sections, ditch diversions and straightened reaches remaining and the DNR will continue to work to improve the overall ecological condition of the landscape, focusing on improving the trout fishery to the extent feasible.

In addition to physical habitat stressors, invasive species like New Zealand Mudsnails continue to colonize Wisconsin's trout streams. Established populations have been found in Badger Mill Creek and are likely within the Sugar River. Research and monitoring are underway to determine any impacts new invaders like mudsnails pose to the trout fishery and ecology of the stream. Anglers and paddlers need to be mindful of transporting these organisms between the waterways they recreate in. Freezing gear or disinfecting protocols (bleach, Virkon, steam) are the best ways to be sure your gear is free of aquatic invasive species between trips.

Management Goals and Objectives

1) **Goal** – Maintain or increase Brown Trout abundance in Sugar River and Badger Mill Creek
   Objective - Increase adult Brown Trout >8 inches CPE to at least 217 adult trout per mile (the statewide median benchmark for this size class)
   Strategy - Stock large fingerling Brown Trout at appropriate levels and locations that anglers are likely to benefit from
      a. assess status of fishery and need for stocking in the next watershed assessment
2) **Goal** – Increase natural recruitment of Brown Trout on Class 2 waters of Sugar River and Badger Mill Creek
   Objectives – Increase average CPUE yearling catch rates to 209 per mile (meet or exceed statewide median benchmark for this size class)
      a. some reaches meet the definition of Class 1 waters, but overall abundances are lower than desired for Class 1 designation

Strategy – Conduct habitat improvement projects along publicly accessible lands
Strategy – Promote and support groundwater and riparian land protections in sensitive areas subject to development pressures in the watershed.

a. Collaborate with local landowners, conservation organizations and government agencies to acquire easements or lands to increase buffer areas, encourage native vegetated riparian corridors, increase public access and implement habitat improvement projects in the Sugar River
    i. Improve habitat and water quality to increase survival and recruitment of naturally reproduced fish within the watershed with 1-2 miles of Trout Stamp funded habitat improvement project.
    ii. Assess success of stocking program and trout classification in next trout survey rotation

3) **Goal**- Improve Brook Trout genetics in Story Creek to native Wisconsin strain while promoting Brook Trout over Brown Trout, to extent feasible
Objective- Increase adult Brook Trout abundances to meet or exceed the Driftless Area benchmark (85 per mile >7 inches)
Objective – Replace domestic strain Brook Trout genetics with wild Brook Trout genetics
Strategy – Resume stocking large fingerling Brook Trout, with appropriate genetics, and evaluate efficacy with annual trend survey data collections and collect additional genetic samples at conclusion of stocking program to reassess genetic contributions of stocked products
Strategy- Pursue habitat improvements and hydrological improvements within Story Creek designed to promote Brook Trout and deter Brown Trout to extent feasible
    a. Promote cold water habitats Brook Trout prefer with improved hydrology by meandering and connecting disjointed stream threads, filling lateral ditches, increasing pool habitats, and providing overhead cover where it is lacking
    b. Restore or protect forested wetlands and shaded riparian corridors to help promote Brook Trout preferred, coldest water temperatures possible

ADDITIONAL MANAGEMENT RECOMMENDATIONS

1) Reclassify Gill Creek as Class 2 trout waters in 2024 reclassification cycle
2) Maintain harvest opportunities with current regulation of 8 inch minimum, three daily bag limit
3) Evaluate angler-use and harvest within the watershed using angler creel surveys
4) Improve angler access in the Sugar River watershed including its tributaries with fee title acquisitions, stream bank easements or donations or other partnerships
    a. Southeast Glacial Plains regional planning effort within the DNR master planning process will begin in 2024.
        i. Modifying DNR Natural Resource Project Boundaries to follow existing parcel boundaries along classified trout streams would

streamline potential DNR fisheries' acquisition process for new parcels available for public recreation.

1. For example, the current Natural Resources Board boundary excludes most of the Sugar River watershed and tributaries, including headwater reaches of Story Creek, Gill Creek, Badger Mill Creek and Schlapbach Creek, as well the majority of the main-stem Sugar River.
2. Public access is prerequisite for consideration of Trout Stamp funded habitat improvement projects needed to address large scale habitat degradation.

Tables and Figures

Table 1. Trout stocking in the Sugar River Watershed 2015-2021. Stocking events with an asterisk were provided by surplus hatchery production and not initially requested.

Stream	Species	Age	2015	2016	2017	2018	2019	2020	2021
Badger Mill	Brown	Large Fingerling	877	390	500	505			
		Small Fingerling		500					
Henry Creek	Brook	Large Fingerling	417						
Schlapbach	Brook	Large Fingerling	942	400					
Story	Brook	Large Fingerling	3200	3000					759
		Adult		60					
Sugar	Brown	Large Fingerling				7537*			
		Adult							100*
	Brook	Adult							270*
	Rainbow	Small Fingerling			21945*	7500*	8720*	19188*	9935*

Table 2. Brown Trout catch rates in for the Sugar River watershed. Catch Per Unit Effort (CPUE) units are numbers fish per electrofishing mile. Streams marked with asterisk indicate survey data from 2020, all others are from 2021 surveys. Values shown in red indicate a catch rate below the statewide median CPUE.

Stream	Station (ID)	N	Mean Length (In)	<4" YOY CPUE	4-8" Yearling CPUE	>8" CPUE	>12" Preferred CPUE	>15" Memorable CPUE	>18" Trophy CPUE	Total CPUE
Badger Mill	Confluence (5)	28	7.4	48.3	48.3	128.7	0.0	0.0	0.0	225.3
	HWY 69 (6)	69	8.5	72.9	85.0	261.1	54.7	12.1	6.1	419.0
	Bruce St. (3)	71	8.9	11.7	123.2	281.6	41.1	0.0	0.0	416.5
Gill Creek	Behnke Rd. (148)	8	5.1	46.0	61.3	15.3	0.0	0.0	0.0	122.6
	Freidig Rd. (149)	2	4.7	16.1	16.1	0.0	0.0	0.0	0.0	32.2
Henry Creek*	HWY 69 (7)	13	4.2	98.0	70.0	14.0	0.0	0.0	0.0	181.9
	RR Track (8)	9	3.8	112.7	32.2	0.0	0.0	0.0	0.0	144.8
Schlapbach Creek*	Klevenville Riley (10)	1	9.3	0.0	0.0	15.3	0.0	0.0	0.0	15.3
	Sletto Rd.(12)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Townhall Rd. (14)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Perimeter Rd. (13)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Story Creek	HWY X (34)	38	9.2	45.9	275.5	551.0	160.7	45.9	45.9	872.3
	Story Creek Circle (36)	100	7.3	237.6	199.3	329.5	84.3	30.7	0.0	766.4
	HWY 92 (35)	160	5.6	1642.7	625.8	860.4	39.1	19.6	19.6	3128.9
	Alpine Rd. (17)	77	9.9	75.7	142.0	511.2	208.3	94.7	9.5	728.9
Sugar River	Below Dam (24)	71	8.1	64.5	123.2	228.8	58.7	0.0	0.0	416.5
	Frenchtown Rd. (19)	38	9.2	11.2	33.7	97.3	22.5	3.7	0.0	142.2
	Basco Property (29)	34	9.5	12.1	44.3	80.5	36.2	4.0	4.0	136.8
	Bruce Co Bridge (25)	188	8.7	61.1	297.4	407.4	81.5	20.4	8.1	766.0
	Riverside Rd. (22)	52	8.9	21.7	47.8	156.6	21.7	0.0	0.0	226.2
	Valley Rd. (27)	169	5.9	445.9	252.3	293.3	64.5	11.7	5.9	991.5
	Bobcat Lane (30)	32	11.1	14.3	35.8	178.8	78.7	50.1	14.3	228.9
	HWY PD (32)	54	8.5	64.4	193.1	321.9	42.9	21.5	10.7	579.4
	Valley Spring Rd. (31)	2	11.2	0.0	0.0	42.9	21.5	0.0	0.0	42.9
Unnamed trib. to Sugar	Sugar River Rd. (33)	1	3.0	16.1	0.0	0.0	0.0	0.0	0.0	16.1
Driftless Median CPUE				**142**	**238**	**341**	**67**			**730**
Statewide Median CPUE				**128**	**209**	**217**	**52**			**537**

Table 3. Brook Trout catch rates for the Sugar River watershed. Catch Per Unit Effort (CPUE) units are numbers of fish per electrofishing mile. Streams marked with asterisk indicate survey data from 2020, all others are from 2021 surveys. Values shown in red indicate a catch rate below the statewide median CPUE.

Stream	Station (ID)	N	Mean Length (In)	<4" YOY CPUE	4-7" Yearling CPUE	>7" CPUE	>10" Preferred CPUE	>12" CPUE	Total CPUE
Gill Creek	Freidig Rd. (149)	3	7.27	0.00	32.19	16.09	0.00	0.00	48.28
Schlapbach Creek*	Klevenville Riley (10)	1	9.80	0.00	0.00	15.33	0.00	0.00	15.33
	Sletto Rd.(12)	22	9.07	43.89	14.63	263.35	102.41	43.89	321.87
	Town Hall Rd. (14)	38	5.06	96.56	418.43	96.56	0.00	0.00	611.55
	Perimeter Rd. (13)	1	4.50	0.00	18.93	0.00	0.00	0.00	18.93
	Alpine Rd. (17)	8	7.39	18.93	9.47	47.33	18.93	0.00	75.73
Story Creek	HWY 92 (35)	1	6.30	0.00	19.56	0.00	0.00	0.00	19.56
Sugar River	Valley Rd. (27)	2	9.20	0.00	0.00	10.22	5.11	0.00	10.22
Driftless Median CPUE				**132**	**86**	**85**	**18**		**219**
Statewide Median CPUE				**148**	**156**	**85**	**18**		**336**

Table 4. Coldwater index of biotic integrity (IBI) scores, temperature, flow, stream width and habitat ratings for the Sugar River watershed.

Stream	Station (ID)	IBI Score	Temp. (°F)	Flow (CFS)	Mean Stream Width (meters)	Habitat Score
Badger Mill	**2021 Average**	**63.3**	**62.2**	**8.9**	**6.4**	
	Confluence (5)	70	63		5.7	
	HWY 69 (6)	60	62	13.4	7.5	43
	Bruce St. (3)	60	61.7	4.5	6	
Gill Creek	**2021 Average**	**50**	**63**		**1.45**	
	Behnke Rd. (148)	50	64	10.6	1.5	
	Freidig Rd. (149)	50	62		1.4	40
Henry Creek*	**2020 Average**	**40**	**56**		**1.9**	
	HWY 69 (7)	50	59		2	
	RR Track (8)	30	53	3.5	1.75	67
Schlapbach Creek*	**2020 Average**	**73.5**	**54.6**	**3.3**	**2.7**	**49.3**
	Klevenville Riley (10)	90	54	4.6	3	38
	Perimeter Rd. (13)	40	56		2.5	
	Sletto Rd.(12)	80	54.5	3.5	2.6	52
	Town Hall Rd. (14)	80	54	1.8	2.8	58
Story Creek	**2021 Average**	**92.5**	**66.3**	**30.1**	**5.9**	**79.5**
	HWY X (34)	80	70.5	33.2	6.6	77
	Story Creek Circle (36)	100	68	27.9	6	82
	HWY 92 (35)	100	65.6		7	
	Alpine Rd. (17)	90	61	29.3	3.9	77
Sugar River	**2021 Average**	**65.6**	**64.4**	**37.7**	**10.3**	**55.4**
	Below Dam (24)	50	60.6	51.1	25	
	Frenchtown Rd. (19)		68.3	55.1	13	65
	Basco Property (29)	70	70.2	52	13	60
	Bruce Co Bridge (25)	80	65.3	30.3	10	73
	Riverside Rd. (22)	70	63	28.3	10	36
	Valley Rd. (27)	75	62.5	27.1	8.6	62
	Bobcat Lane (30)	70	63	20	5	57
	HWY PD (32)	70	63		4	
	Valley Spring Rd. (31)	40	63.3	5.7	4.2	35
Unnamed trib (Sugar)	Sugar River Rd. (33)	80	71.6	3.9	3	20

Table 5. Total catch rates for Mottled Sculpin and White Sucker, IBI scores and predicted stream natural community categories for the Sugar River watershed.

Stream	Station (ID)	IBI Score	Natural Community Prediction	Mottled Sculpin CPUE	White Sucker CPUE
Badger Mill	Confluence (5)	70	Cool-Cold Mainstem	145	386
	HWY 69 (6)	60	Cool-Cold Mainstem	0	904
	Bruce St. (3)	60	Cool-Cold Mainstem	0	1496
Gill Creek	Behnke Rd. (148)	50	Cool-Cold Headwater	445	322
	Freidig Rd. (149)	50	Cool-Cold Headwater	0	0
Henry Creek*	HWY 69 (7)	50	Coldwater	825	209
	RR Track (8)	30	Coldwater	65	28
Schlapbach Creek*	Klevenville Riley (10)	90	Cool-Cold Headwater	812	31
	Sletto Rd.(12)	80	Cool-Cold Headwater	995	0
	Town Hall Rd. (14)	80	Cool-Cold Headwater	901	0
	Perimeter Rd. (13)	40	Cool-Cold Headwater	0	0
Story Creek	HWY X (34)	80	Cool-Cold Mainstem	275	1079
	Story Creek Circle (36)	100	Cool-Cold Mainstem	138	529
	HWY 92 (35)	100	Cool-Cold Mainstem	254	645
	Alpine Rd. (17)	90	Cool-Cold Mainstem	284	634
Sugar River	Below Dam (24)	50	Cool-Cold Mainstem	24	1472
	Frenchtown Rd. (19)		Cool-Cold Mainstem	0	150
	Basco Property (29)	70	Cool-Cold Mainstem	129	1042
	Bruce Co Bridge (25)	80	Cool-Cold Mainstem	16	566
	Riverside Rd. (22)	70	Cool-Cold Mainstem	149	395
	Valley Rd. (27)	75	Cool-Cold Mainstem	422	459
	Bobcat Lane (30)	70	Cool-Cold Mainstem	193	544
	HWY PD (32)	70	Coldwater	118	300
	Valley Spring Rd. (31)	40	Cool-Cold Mainstem	0	22
Unnamed trib (Sugar)	Sugar River Rd. (33)	80	Coldwater	499	177

Table 6. Brook Trout CPUE (fish/mile) percentile breakdown for stream surveys conducted on Class 1 trout streams in the Driftless Area and statewide where at least one trout was collected, 2012-2021.

	CPUE total	(All sizes)	CPUE age 0	(<4.0 inches)	CPUE age 1	(4.0-6.9 inches)	CPUE adult	(≥7 inches)	CPUE preferred	(≥10 inches)
Percentile	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**
10	15.1	22.9	16	16.1	12.4	16.1	12.8	15.3	6.5	5.7
25	53.0	96.6	46	45.3	30.5	48.3	30	32.2	11.1	10.3
35	107.1	174.7	68.6	72.4	44.9	80.5	47.9	48.3	14.3	12.8
50 (median)	219.9	336.8	128.7	145.3	80.5	149.2	80.5	80.5	16.1	16.4
65	402.3	579.7	209.2	241.4	150.9	257.2	124	129.4	29.1	27.5
75	590.1	772.5	321.9	365.5	234.2	366.7	177.7	185.2	37.5	37.4
90	1223.0	1488.4	787.1	812.3	548.7	662.7	347	344	64.4	64.4

Table 7. Brown Trout CPUE (fish/mile) percentile breakdown for fishery surveys conducted on Class 1 trout streams in the Driftless Area and statewide where at least one trout was collected, 2012-2021.

	CPUE total (All sizes)		CPUE age 0 (<4.0 inches)		CPUE age 1 (4.0-7.9 inches)		CPUE adult (≥ 8 inches)		CPUE preferred (≥12 inches)	
Percentile	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**	**Driftless Area**	**Statewide**
10	108.3	39.7	15.1	12.5	27.9	21	40.2	18.9	16.1	10.6
25	323.6	178.4	40.2	32.2	82.6	70.6	128.7	63.8	31.9	20.3
35	492.2	305.9	71.1	58.1	135.6	115	191.6	112.7	42.9	30.3
50 (median)	729.8	537.3	136.1	119.3	229.9	199.2	330.8	205.8	63.2	47.6
65	1121.4	880.6	256.1	247.5	383.2	337.2	509.7	341.9	85.8	72
75	1478.3	1241.7	405.4	402.1	518.8	482.8	677.6	479.2	115	91.4
90	2720	2203.1	856.7	933.5	877.1	836.6	1194.2	864.5	181.5	156.5

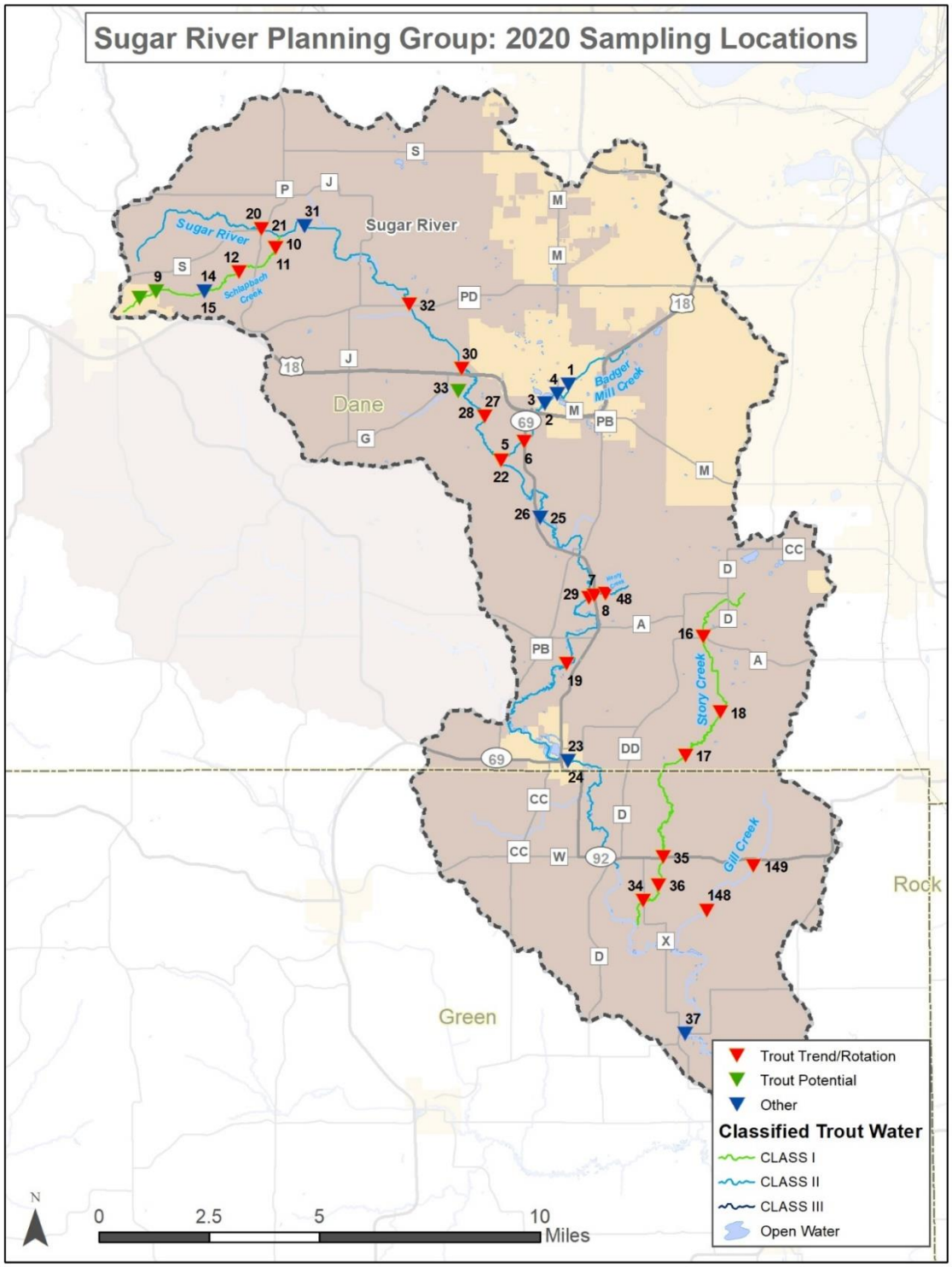

Figure 1. Stream classifications and fishery assessment survey sites within the Sugar River watershed 2020-2021.

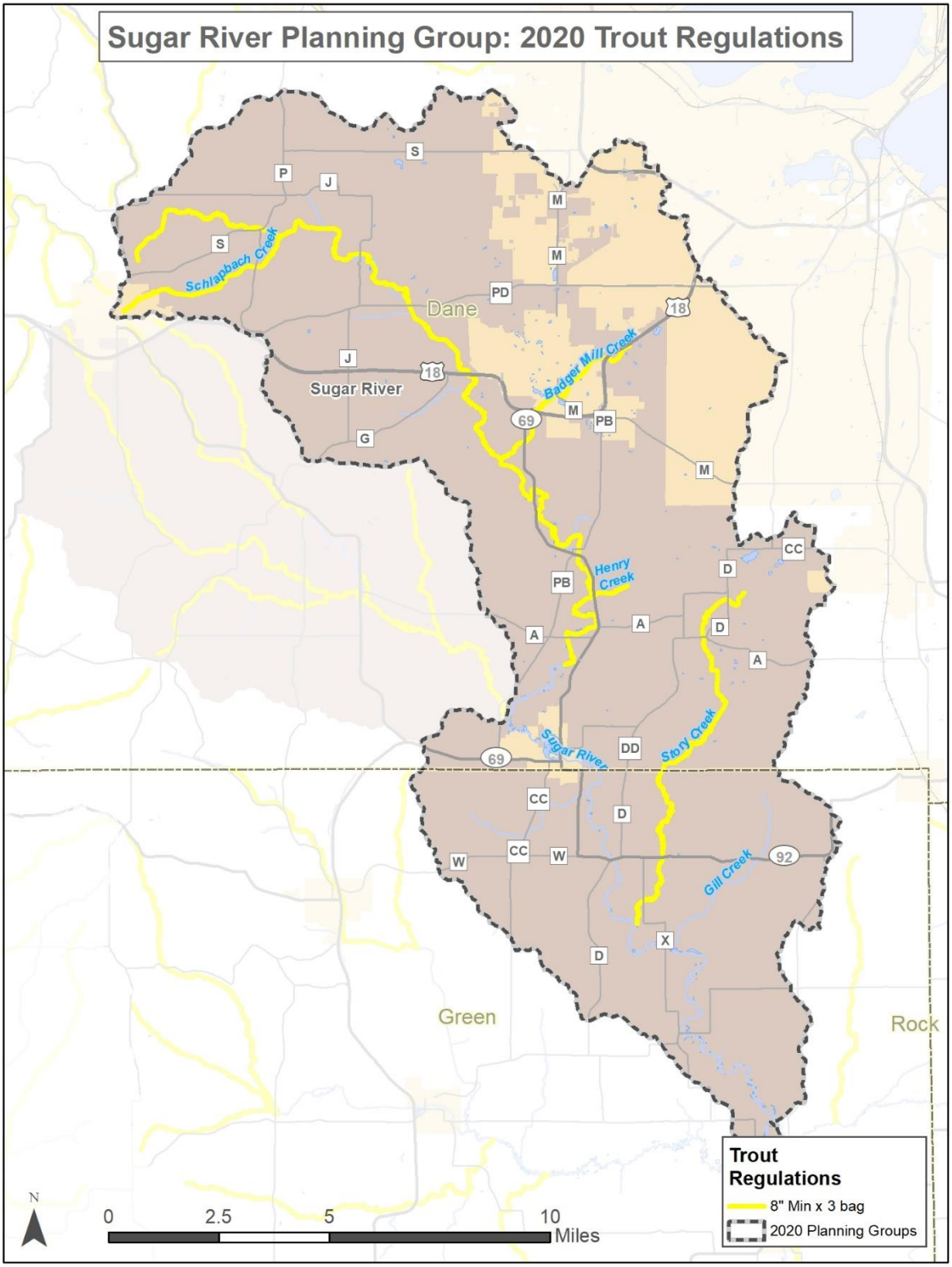

Figure 2. Sugar River watershed trout streams are regulated under the county base 8 -inch minimum length and three daily-bag limit.

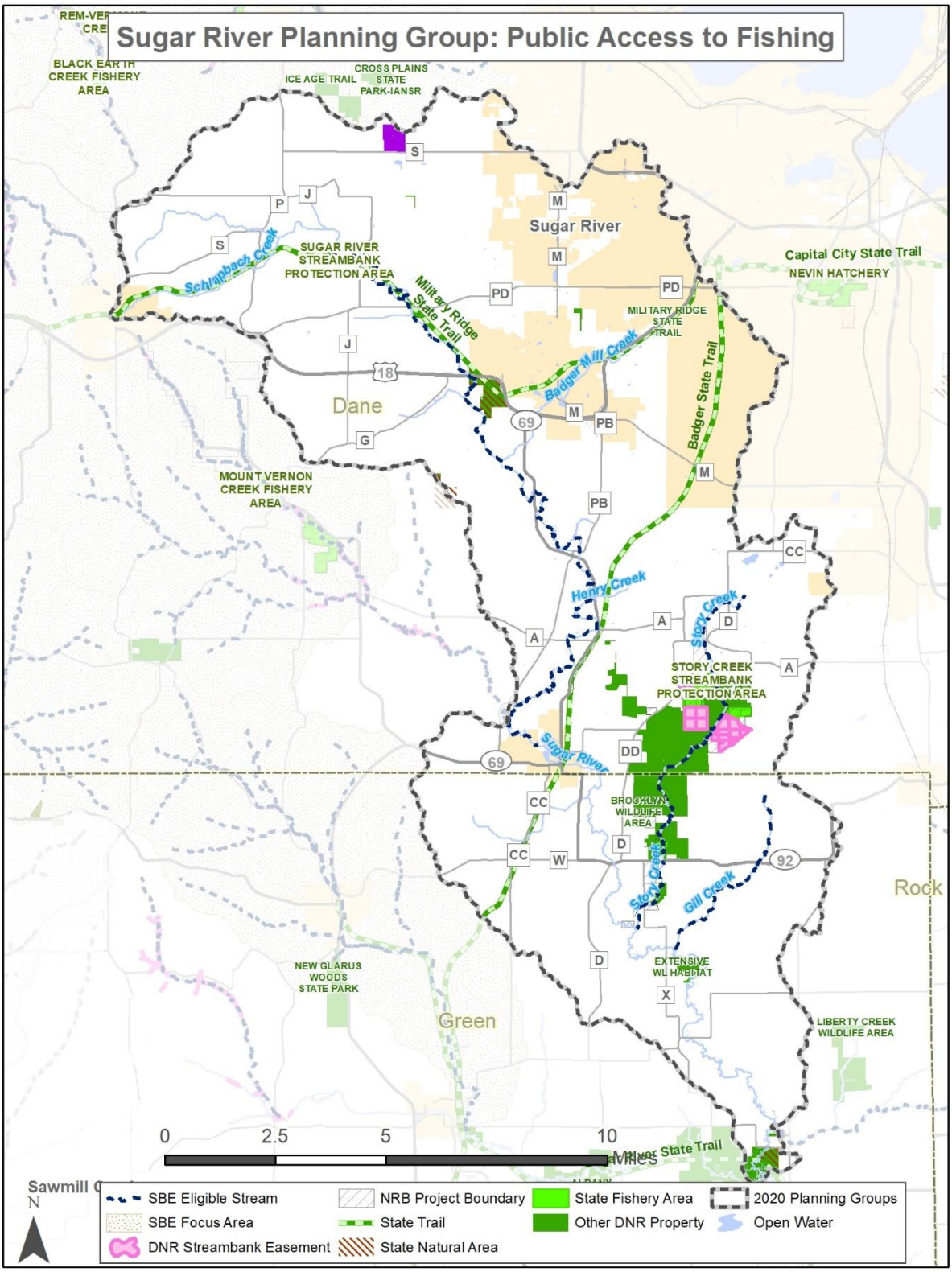

Figure 3. Sugar River watershed public access points and DNR Stream Bank Easement Program eligible waters.

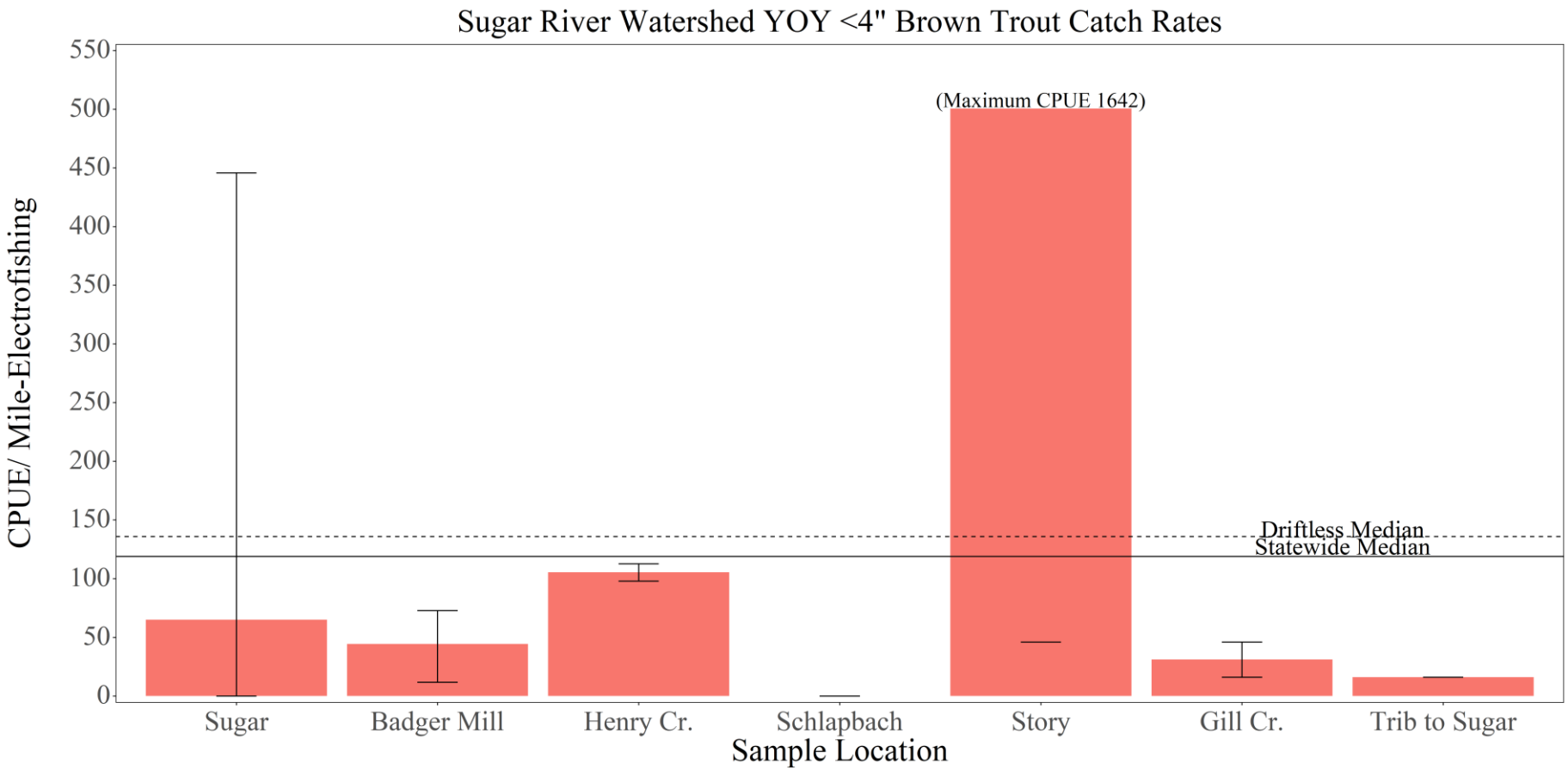

Figure 4. Average young-of-year Brown Trout catch rates (<4 inches) across all survey sites for each stream. Error bars represent minimum and maximum catch rates observed in the survey.

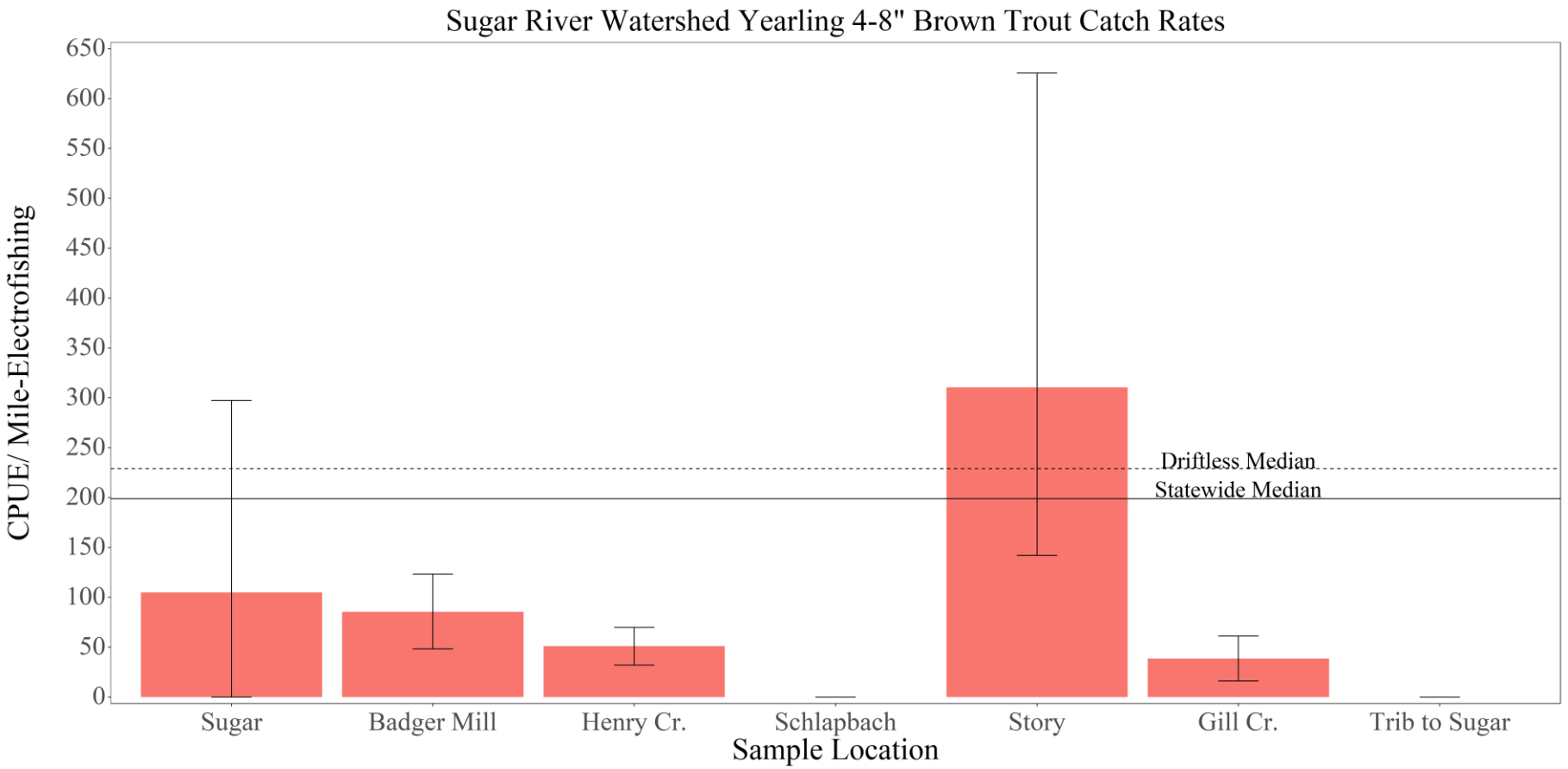

Figure 5. Average yearling Brown Trout catch rates (>4 & <8 inches) across all survey sites for each stream. Error bars represent minimum and maximum catch rates observed in the survey.

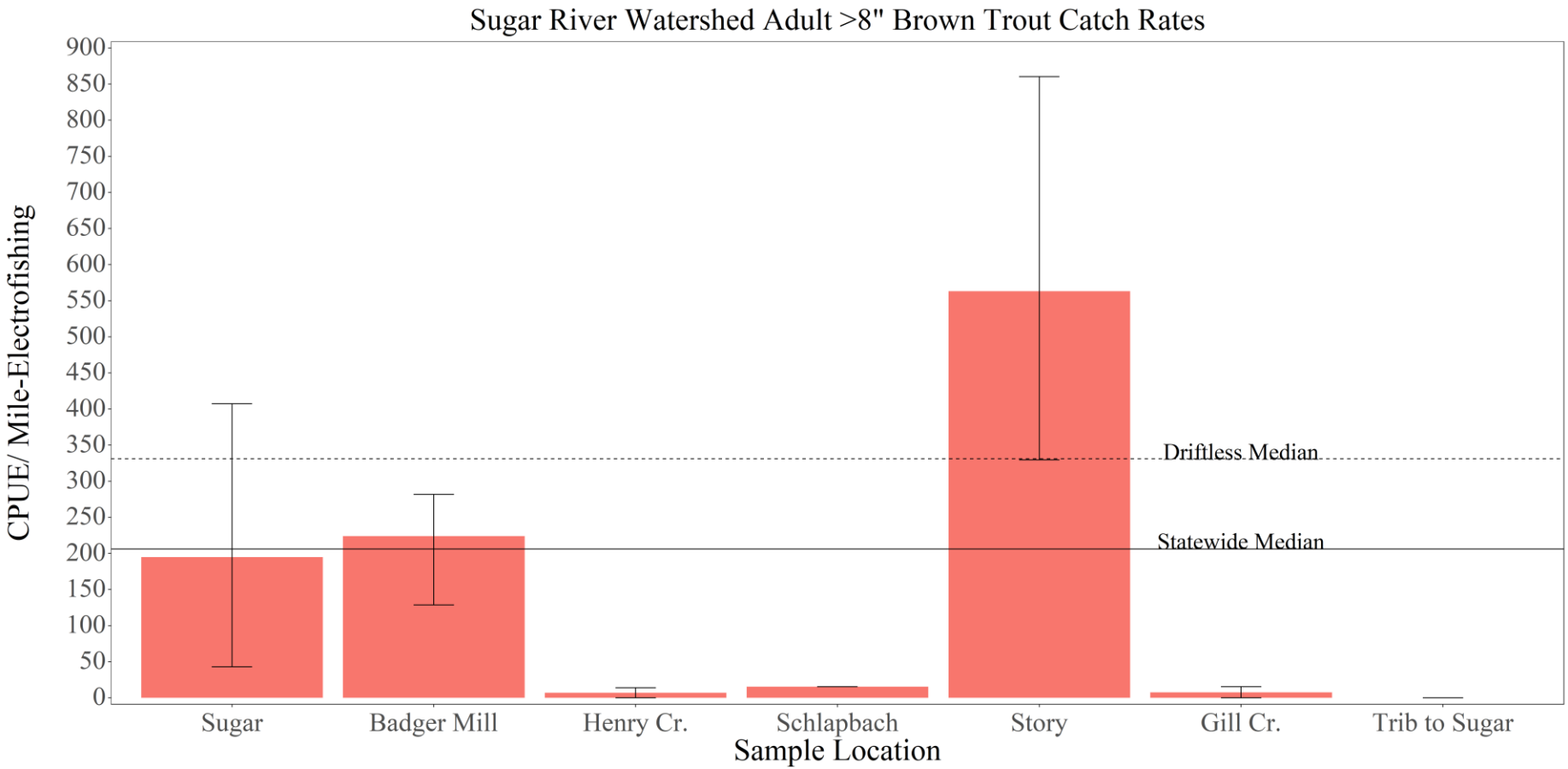

Figure 6. Average adult Brown Trout catch rates (>8 inches) across all survey sites for each stream. Error bars represent minimum and maximum catch rates observed in the survey.

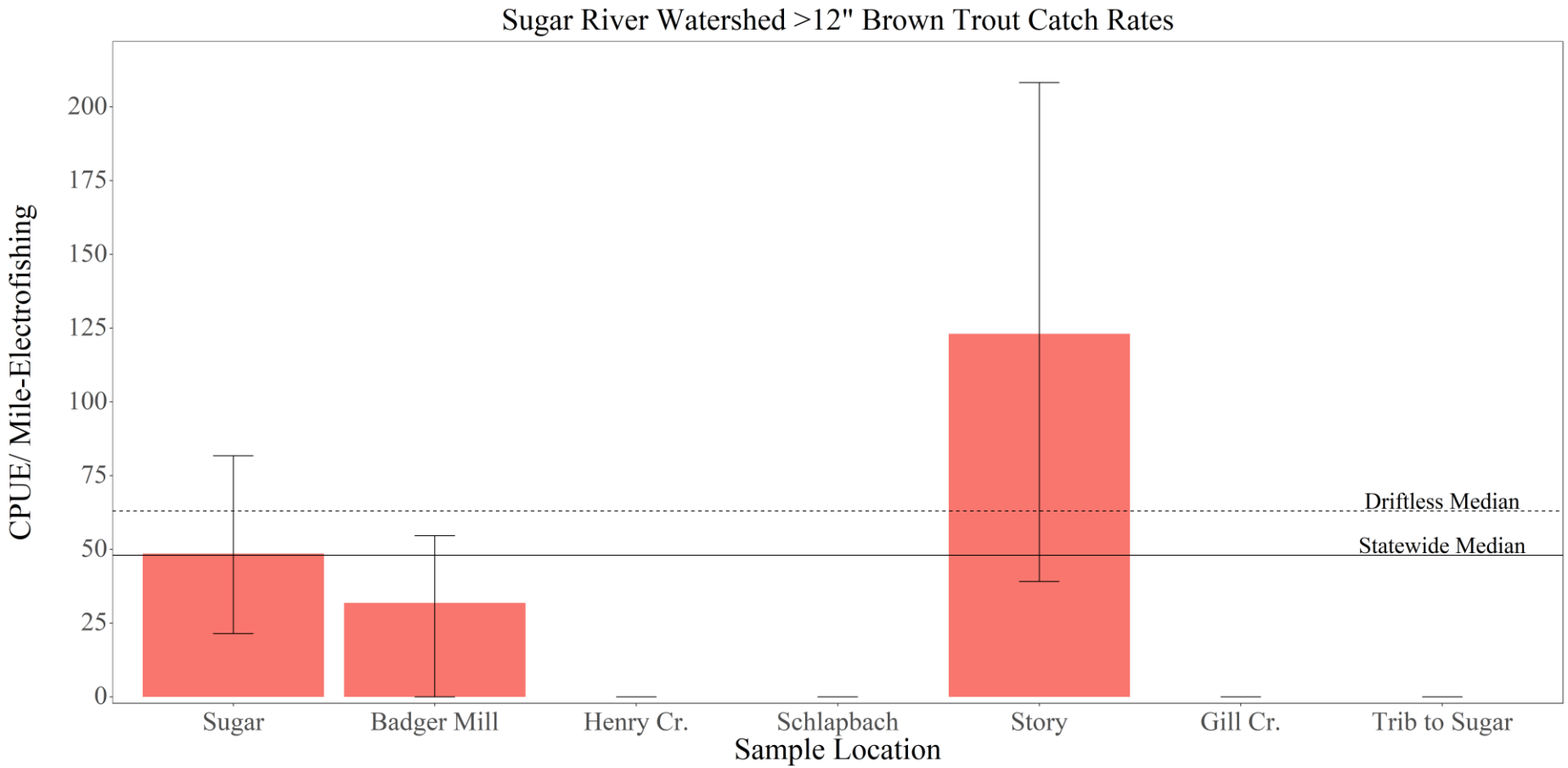

Figure 7. Average preferred Brown Trout catch rates (>12 inches) across all survey sites for each stream. Error bars represent minimum and maximum catch rates observed in the survey.

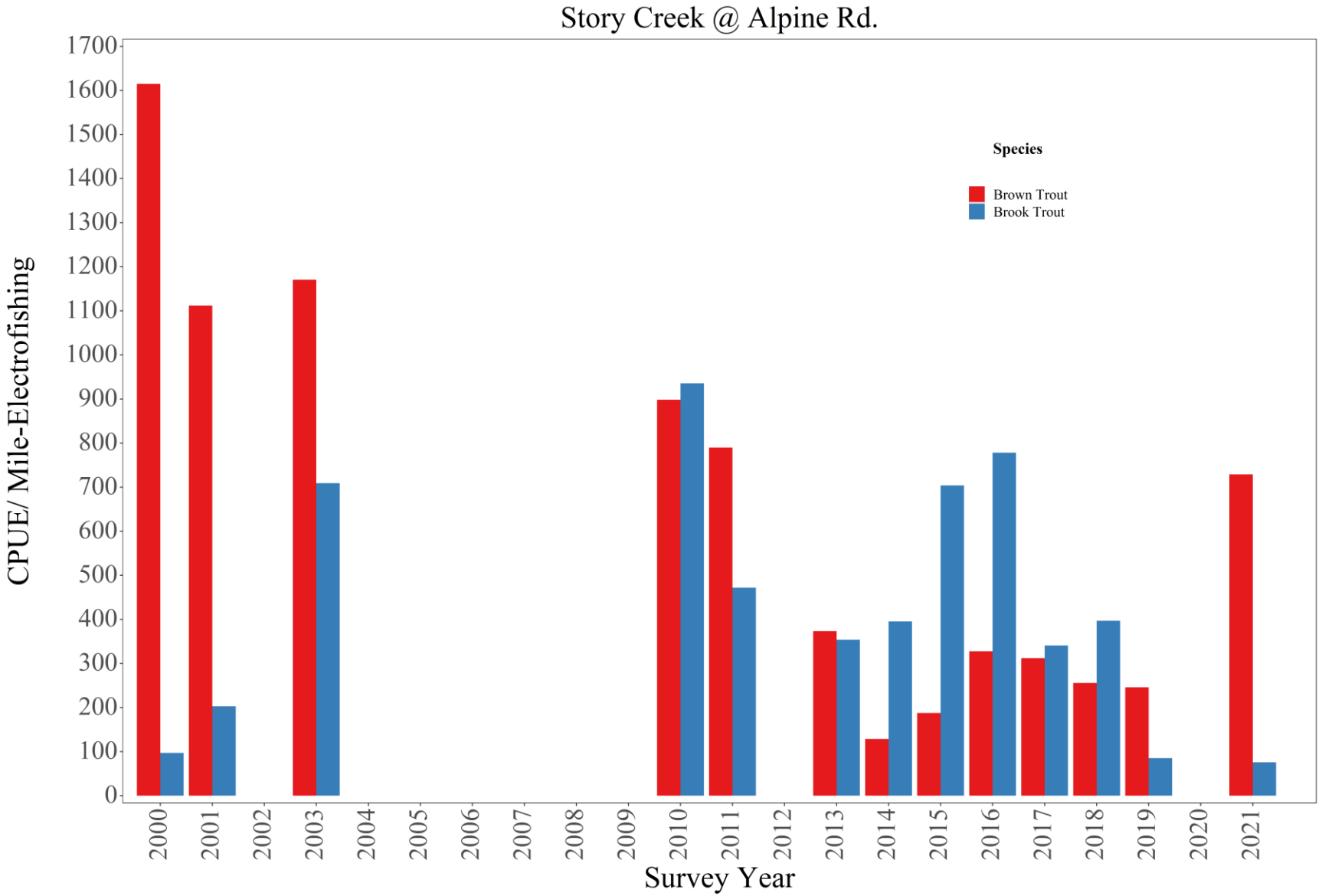

Figure 8. Total catch rates for Brown and Brook Trout at the Story Creek trend survey site at the upper end of the Alpine Road Habitat Area.

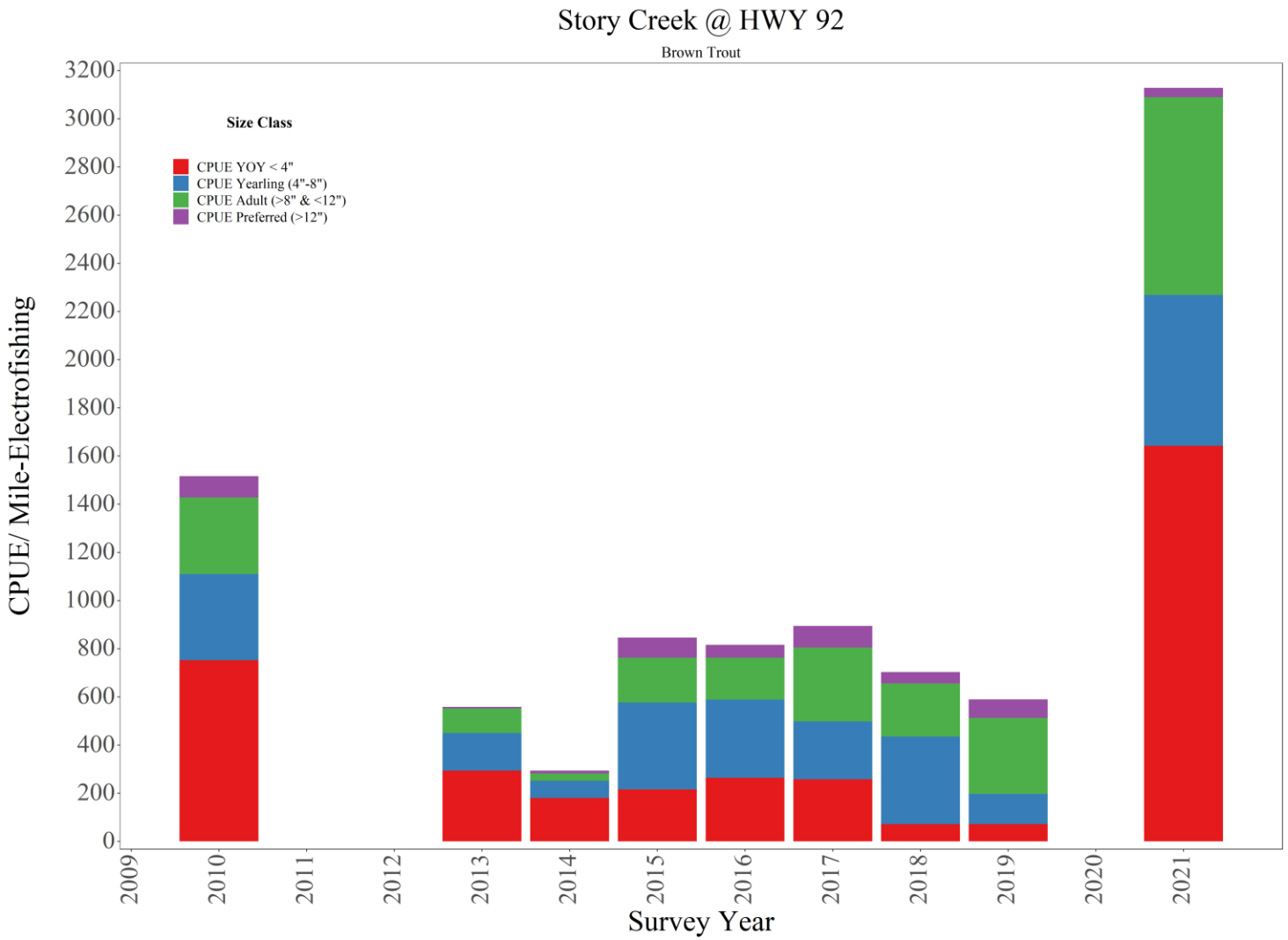

Figure 9. Size specific catch rates for Brown Trout at the Story Creek trend survey site at the HWY 92 road crossing.