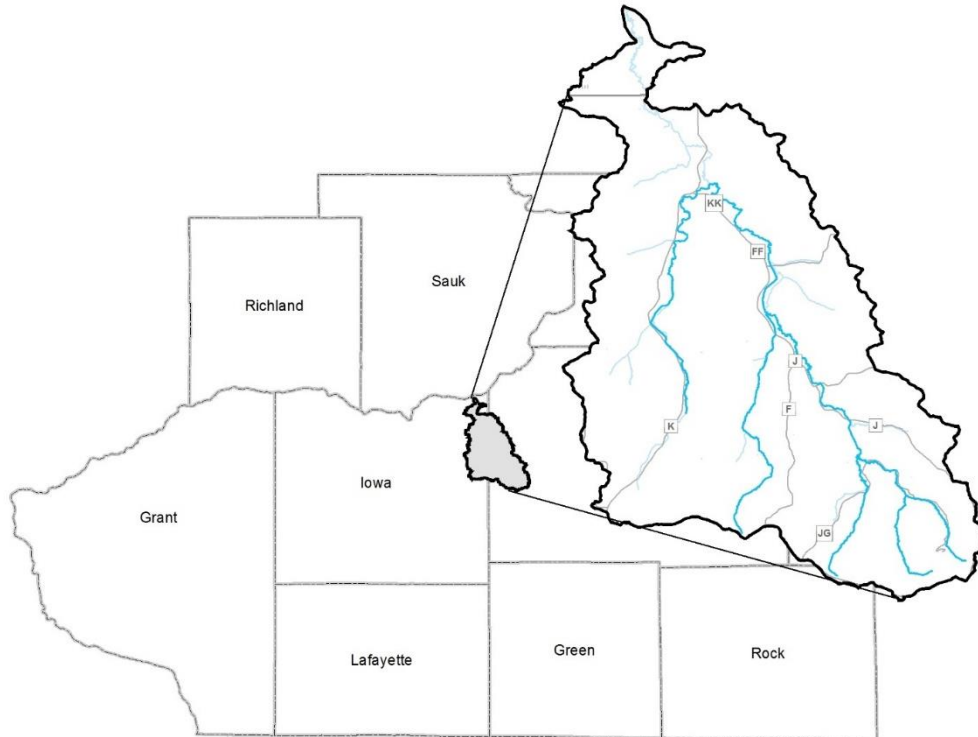


WISCONSIN DEPARTMENT OF NATURAL RESOURCES

**Trout Stream Management And Status Report Of
Blue Mounds Branch Watershed
Dane County, Wisconsin**



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Executive Summary

We surveyed one site in Blue Mounds Creek, four in West Branch Blue Mounds Creek, two in East Branch Blue Mounds Creek, four in Elvers Creek, three in Bohn Creek, three in Ryan Creek, one in Moen Creek and one site in Little Norway Creek (Figure 1 for a map of sample locations). All 20 stream sites were surveyed with 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 the Wisconsin Department of Natural Resources (DNR) Fish Management Handbook protocols.

The average catch rate of Brown Trout across all sampled sites in the classified trout waters was 330 per mile and ranged from 32 per mile to 1,467 per mile. The average catch rate of total Brown Trout for each stream was: West Branch Blue Mounds 102 per mile, East Branch Blue Mounds 202 per mile, Elvers 816 per mile, Bohn 150 per mile, Ryan 429 per mile and Moen Creek 450 per mile. Brook Trout were limited to Bohn Creek and Little Norway, with an average catch rate of 156 trout per mile and provide a unique fishing opportunity. Elvers Creek and Ryan Creek aside, the majority of the trout streams in this watershed have relatively low abundance but provide angling opportunities for larger-sized fish. For example, most sites had moderate catch rates for 8" and 12" fish, but smaller-sized fish were rare. Brook Trout were dominant in Bohn Creek (Table 1).

The trout abundances were high enough, with several age classes represented within Ryan and Elvers Creek, to justify upgrading from Class 2 to Class 1 trout waters while most other stream segments were performing as Class 2 fisheries.

A caveat to the fish abundances and inferences made in this report is that regional flooding in 2018 and persistent high-water likely reduced our catch rates as young fish were removed or displaced during our surveys in 2019. Future assessments will be needed to further elucidate the extent to which flooding impacted our survey results and inferences.

Due to limited public access and regular stocking that has not produced quality angling opportunities, stocking will be discontinued in East Branch Blue Mounds Creek. Moen Creek has not been stocked, and we have no plans to initiate a stocking program there, given the limited public access to that stream and the impounded headwaters that form Stewart Lake. West Branch Blue Mounds Creek will continue to be stocked with large fingerling Brown Trout, and we plan to reevaluate the efficacy of stocking here during the next survey rotation. Since we do not regularly stock Class 1 trout waters, Elvers and Ryan creeks (when upgraded) do not need stocking to sustain the fishery.

With the exception of small holdings within DNR lands and easements on Elvers, Bohn and Little Norway Creeks, public access is limited since the majority of riparian lands are held in large tracts of private ownership (Figure 3). Targeted stream bank outreach, with a goal of acquiring a select few public fishing easements, would result in large areas of new public fishing opportunities. In addition to targeted easement outreach, establishing a formal DNR fishery area boundary around current remnant authority acquisitions and existing fee title lands, with newly formed boundaries for future potential acquisitions, would aid DNR staff in managing the trout fishery while providing additional public recreational lands.

The current 8-inch minimum length three daily bag limit regulation is appropriate for the streams in this watershed at this time.

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Watershed Location

Blue Mounds Creek Watershed, Dane County including Blue Mounds Creek, West Branch Blue Mounds Creek (Iowa County), East Branch Blue Mounds Creek, Elvers Creek, Ryan Creek, Bohn Creek, Moen Creek and Little Norway Creek.

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 20, 2019 – Aug. 29, 2019

Fish Species Observed In The Survey

All fish encountered were collected and recorded including Bluegill, Brown Trout, Creek Chub, Emerald Shiner, Fantail Darter, Mottled Sculpin, White Sucker, Green Sunfish, Brook Stickleback and Brook Trout.

Introduction

SUMMARY OF THE WATERSHED

Blue Mounds Creek and its tributaries that form the eastern branch originate northwest of the town of Mount Horeb in Dane County, while the western portion flows north of the town of Blue Mounds in Iowa County. The stream flows north before joining the Wisconsin River near the town of Arena. The watershed encompasses 187 square miles with a mix of forested (54%), grasslands (20%), agricultural (15%), developed (10%) and wetlands (1%).

Blue Mounds Creek is a large tributary of the Wisconsin River which drains Black Earth Creek, East Branch Blue Mounds Creek, West Branch Blue Mounds Creek and their tributaries. It is a cool-warm river in the upper reaches and cool-cold river in the lower reaches based on the DNR's Stream Natural Community Model. The dynamic thermal properties of this area limit its potential for a trout fishery, although adult Brown Trout are present in low abundance in the unclassified reaches. The river is generally wide and often wadable but has many areas of deeper water. The watershed is more forested than other area trout streams, and the habitat is generally good for trout and other aquatic life with higher quality riparian buffers. Yet, the stream suffers from typical degradation such as bank erosion and incision. As a result, the fish community is comprised of a mix tolerant species (White Sucker) and those indicative of higher water quality (Brook and Brown Trout, Mottled Sculpin). Most of the waterway north of HWY 14 is publicly accessible via the DNR-owned Lower Wisconsin Riverway lands, while lands south of HWY 14 are privately owned.

East and West Branch Blue Mounds Creek split from the Blue Mounds Creek to form the two main river systems that, along with their tributaries, contain the classified trout waters (Class 2) in this watershed. The East Branch originates downstream of the confluence of Ryan and Elvers Creek and flows north until it's confluence with the West Branch near the intersection of HWY K and HWY KK. The headwaters of the West Branch originate just north of the Blue Mounds State Park, where it flows north until it meets the East Branch. The East and West branches are similar in terms of land use, fish assemblages, threats and fishing opportunities. For example, each had high catch rates of species tolerant of water quality degradation like White Suckers and moderate catch rates of Brown Trout and Mottled Sculpin. The channel hydrology and morphometry are a mix of heavily channelized/straightened but also contain long stretches of natural meanders and sinuosity. Angler access points in these areas are limited to road crossing right-of-way.

Elvers Creek originates near the town of Mount Horeb and is Class 2 trout water for its entire length. The trout abundances in this area are high. The DNR owns fishing

easements downstream of HWY JG, upstream of HWY JJ, upstream of Blue Mounds Trail Rd and owns lands along HWY F.

Ryan Creek is a Class 2 trout stream and a tributary of Elvers Creek. Its headwaters are within Blue Mounds State Park where it flows north until it joins Elvers near Zwettler Road. The majority of the watershed is in private lands with exception of the lowest reaches within the Elvers Creek Fishery Area downstream of HWY F.

Moen Creek is a Class 2 trout stream and a relatively small tributary of Elvers Creek. The headwaters are impounded to form Stewart Lake within the town of Mount Horeb. It flows north until it joins Elvers Creek downstream of Bergum Road. This sub-watershed is within private lands with exception of the Bergum Road right-of-way access and the headwaters within Dane County Stewart Lake Park.

Bohn Creek is a Class 2 trout stream and has a mixed fishery with Brook and Brown Trout, with Brook Trout outnumbering Brown Trout by nearly 3:1. Bohn Creek splits from Elvers Creek near the Tyrol Basin Ski Resort along Bohn Road and originates in a spring complex west of Mount Horeb and north of HWY 18 along Andrew Lane. The watershed is mostly forested and well buffered from agricultural runoff, with riparian shade trees along the banks and abundant woody habitat in-stream. There are three DNR fishing easements along the creek: 1) along Bohn Road directly across the street from Tyrol Basin, 2) downstream of HWY JG, and 3) along Andrew Lane.

Little Norway Creek is a small (1.3 miles) unclassified tributary of Bohn Creek, which flows through a narrow valley west of HWY JG before joining Bohn Creek. There is a DNR public fishing easement west of HWY JG near the Andrew Lane intersection.

CURRENT STATUS

Class 1 trout streams are those with high-quality habitats 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 are 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. The East Branch and West Branch Blue Mounds Creek watersheds are currently classified as Class 2 trout streams, including their tributaries of Elvers, Ryan, Moen and Bohn creeks. Little Norway is unclassified (Figure 1).

Stocking has occurred throughout the watershed utilizing Brook, Brown and Rainbow Trout of various sizes (Table 1). No stocking has occurred within Moen Creek. Bohn Creek is stocked with large fingerling Brook Trout annually. Elvers Creek was stocked with small and large fingerling Brown Trout as recently as 2019, but stocking has since been discontinued. East and West Branch Blue Mounds Creek was regularly stocked with Brown Trout to try to boost the fishery in these reaches.

The entire Blue Mounds Creek watershed is regulated under the standard 8" minimum, three fish daily bag limit for trout (Figure 2).

PUBLIC ACCESS

Large swaths of DNR owned lands near the confluence of Blue Mounds Creek and the Wisconsin River lie within the Lower Wisconsin Riverway corridor. Areas further upstream (south of HWY 14) are predominantly in private lands except for several DNR owned easements detailed in previous sections. Public access to the waterways is also legal via road crossings within the right-of-way. Due to the scarcity of publicly accessible lands within the classified trout waters, DNR Trout Stamp funded projects have not occurred in the watershed.

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, YOY 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 a necessarily a complete lack of natural recruitment.

To assess recruitment to age 1, all stocking of fingerling trout was suspended the year prior to these surveys in Blue Mounds Creek and its tributaries. 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 stocking occurred previously, 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 indicate self-sustaining Class 1 waters. We infer 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. Marginal waters where only stocked fish survive during early spring and summer with limited carry-over and no reproduction are Class 3.

We surveyed one site in Blue Mounds Creek, four in West Branch Blue Mounds Creek, two in East Branch Blue Mounds Creek, four in Elvers Creek, three in Bohn Creek, three in Ryan Creek, one in Moen Creek and one site in Little Norway Creek (Figure 1 for a map of sample locations). All 20 stream sites were surveyed with 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 the DNR's Fish Management Handbook protocols.

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 regional and statewide comparisons in a standardized manner. 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 adult trout (age 2+). YOY are fish less than 4 inches in length, yearlings are between 4 and 7.9 inches for Brown Trout (4-7 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 and greater than ten inches for Brook Trout.

All fish encountered during the survey were collected. We record the species of fish and total length (nearest tenth of an inch). Non-trout species are counted to calculate the 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.

Water quality and habitat metrics were also 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 are also measured using a handheld YSI Pro 2030 meter. Stream habitat metrics were collected using a DNR qualitative habitat rating form. For streams less than 10 m 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 m wide, ratings include bank stability, maximum thalweg depth, riffle:riffle or bend:bend ratio, rocky substrate and cover for fish. All data is recorded digitally using weatherproof handheld Toughbook™ laptops and a custom software application. All fish were returned to the stream.

Relative weights were computed for Brown Trout at the annual trend survey for Elvers Creek at the HWY J site to evaluate body condition. Relative weight (W_r) compares the observed weight of the fish to a standard weight. Relative weight values between 75 and 100 indicate normal weight for a given length. A relative weight value greater than 100 indicates that a fish was in excellent condition. A relative weight value less than 75 indicates that a fish was in poor condition.

Summer stream sampling dates began on June 27 and concluded on Aug. 12, 2019.

Results

Brown Trout were collected in 18 of 20 sites we sampled in 2019 (Table 2). Within the classified trout streams, average catch rates for YOY Brown Trout (<4") was 23 per mile, yearling (4-8") 93 per mile, adult (>8") 238 per mile, preferred (>12") 56 per mile and fish size ranged 3"-23" (Table 2). YOY Brown Trout (natural reproduction) were observed in eleven locations. Yearling Brown Trout (4-8") were observed in sixteen locations, and larger Brown Trout (>8") were observed at 18 sites. Brook Trout were observed in Bohn Creek and Little Norway Creek (Table 3).

Brown Trout YOY catch rates were low, with only two streams (Elvers Creek and Ryan Creek) approaching the statewide median benchmarks (Figure 4). The Elvers Creek site at Hwy J was the only location where the YOY catch rate exceeded the regional and statewide medians (151.5 per mile). The remaining 16 stations had an average Brown Trout YOY catch rate of only 11 per mile. One station in Blue Mounds Creek, three stations in West Branch Blue Mounds and the single station on Moen Creek all recorded zero YOY. Average catch rates for YOY Brown Trout in each of the streams we sampled were: West Branch Blue Mounds was 3 per mile, East Branch Blue Mounds 15 per mile, Elvers Creek 55 per mile, Bohn Creek 5 per mile and Ryan Creek had 36 per mile.

Yearling Brown Trout catch rates across the watershed followed a similar pattern to the observed YOY production; generally low, only Elver's Creek and Ryan Creek stations had average yearling catch rates exceeding the statewide median (Figure 5). All other streams were below the statewide and regional 50th percentile (see Tables 6-7 for catch rate percentile summary benchmarks). Average catch rates for yearling Brown Trout in each of the streams we sampled were: West Branch Blue Mounds was 28 per mile, East Branch Blue Mounds 57 per mile, Elvers Creek 170 per mile, Bohn Creek 21 per mile, Ryan Creek 153 per mile and Moen Creek had 161 per mile.

For adults (>8"), Ryan, Elvers and Moen creeks had average catch rates exceeding the statewide median, but only Elvers Creek exceeded the Driftless median benchmark (Figure 6). Average catch rates for adult Brown Trout in each of the streams we sampled were: Blue Mound Creek 27 per mile, West Branch Blue Mounds was 72 per mile, East Branch Blue Mounds 130 per mile, Elvers Creek 592 per mile, Bohn Creek 42 per mile, Ryan Creek 240 per mile and Moen Creek had 290 per mile.

For fish larger than 12", four of the seven streams had average catch rates exceeding the Driftless benchmark (Figure 7). Average catch rates for Brown Trout greater than twelve inches in each of the streams we sampled were: Blue Mound Creek 21 per mile, West Branch Blue Mounds was 15 per mile, East Branch Blue Mounds 53 per mile, Elvers Creek 106 per mile, Bohn Creek 11 per mile, Ryan Creek 81 per mile and Moen Creek had 97 per mile.

The highest quality Brook Trout water in the watershed is found within Bohn Creek at Bohn Road. This station had catch rates exceeding statewide benchmarks for YOY, adult, preferred and total catch rates. Average catch rates across the three stations we surveyed were: YOY 88 per mile, yearling 0 per mile, adult 109 per mile and greater than ten inches catch rate was 21 per mile (Table 3).

Mottled Sculpin were observed throughout the watershed from the unclassified trout waters within Blue Mounds Creek upstream to the headwaters of Bohn, Elvers and Ryan creeks (Table 5). The highest abundances were in Ryan Creek. White Suckers were observed in the lower reaches of the watershed, including Blue Mounds Creek, East and West Branch Blue Mounds creeks and Elvers Creek but were absent in the headwater streams.

COLDWATER INDEX OF BIOTIC INTEGRITY SCORES AND HABITAT QUALITY FOR THE BLUE MOUNDS CREEK WATERSHED

Median coldwater IBI score across all sites in the Blue Mounds Creek watershed was 70 (out of 100, average score 57) and exceeded the statewide trout stream (60), Driftless trout stream (50) and Dane County (50) median scores (Table 4). The average qualitative habitat rating for Blue Mounds Creek watershed was 56 (out of 100), with all stations scoring as “Good” or “Fair.” Median riparian buffer scores were excellent (15 out of 15). Bank erosion scores varied widely, and all stations had some erosion issues (range 0-10 out of 15). Median scores for other physical habitat metrics showed similar heterogeneous patterns, including pool area (7 out of 15), width:depth ratio (5 out of 15), riffle habitat (5 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 58.9°F (ranged from 53-66). The average stream flow was 20 cfs (ranged 2.12 - 65.3 cfs) with an average width of 3.8 meters.

BLUE MOUNDS CREEK, WEST BRANCH BLUE MOUNDS CREEK AND EAST BRANCH BLUE MOUNDS CREEK

The unclassified trout water of Blue Mounds Creek had the lowest trout abundance in the watershed, with only five Brown Trout observed at the Sawle Road station, all of which were greater than 8”, indicating poor recruitment (Table 2). With only a handful of adult trout observed, the total catch rate of only 27 fish per mile is well below the catch rates observed further upstream in the watershed as well as statewide or Driftless benchmarks.

West Branch Blue Mounds Creek had marginally better trout abundances, but only one site (HWY KK) had any YOY production at all (12.8 per mile), and catch rates of yearling, adults and preferred sizes were all below regional benchmarks (Figures 4-7). The highest catch rates in the West Branch were at the Lewis Road station (154 per mile for adult >8”). Though the stream temperature is within the tolerance limit for adult trout, in-stream habitat for trout is generally scarce in Blue Mounds and the

West Branch. The habitat scores for erosion, riffles, pools and fine sediments all indicated impairment (Table 4).

Though the East Branch scored lower in the general habitat rating, it is colder and had fewer erosion issues and fine sediments were scarce. As a result, the East Branch had higher trout abundances than the main-stem Blue Mounds Creek or the West Branch. Both stations in the East Branch contained a diversity of trout sizes and age classes. Though catch rates for YOY and yearling age classes were low, catch rates for adults and preferred sizes exceeded regional benchmarks at the HWY F (340 per mile) and had much higher catch rates than the Sutcliffe Road station (65 per mile), indicative of better trout habitat in those reaches.

ELVERS CREEK

With above average habitat scores, diverse stream channel morphology, cold stream temperatures and good IBI scores, Elvers Creek had the highest quality trout waters in the watershed (Tables 2 & 4). For example, the survey sites at HWY J and HWY JJ had the highest total catch rates across all size classes. HWY J (151 YOY per mile) had the highest catch rates of YOY and exceeded the Driftless area median catch rate (136 YOY per mile). The HWY JJ and HWY J stations exceeded the statewide median catch rates for yearling trout 4" - 8" (>199 per mile). Those two stations, along with the Blue Mounds trail site, also exceeded the Driftless catch rates for fish >8" (>331 per mile) and two of four stations exceeded the Driftless median catch rate for trout >12" (> 63 per mile).

Elvers Creek at HWY J is one of the DNR annual trend sites and is sampled every year at the same location at the same time of year. This reach has been surveyed regularly since the early 2000s (Figure 8). This reach has had a stable population, with about 1,000 trout per mile until a marked increase in trout abundance was noted beginning in 2017. By 2021, the total catch per mile had increased to over 2,600, with high catch rates of all size classes of trout. As such, this stretch of river boasts the highest catch rates across the entire watershed (including Black Earth Creek). The lower abundances observed in 2019 compared to 2018 and 2021 may have been evidence of a lagged response following the 2018 floods that temporarily reduced recruitment.

Mean relative weight of Brown Trout in Elvers Creek at the trend site is 88.7, indicating the trout were in excellent body condition. Only four fish (3.1%) were in poor body condition (below the relative weight index score of 75).

RYAN CREEK

Ryan Creek had all four size classes of fish present at all three survey sites, but abundances were generally low. Only the Ryan Creek Road site exceeded statewide median catch rates of YOY and yearling catch rates. The Shower Road survey had catch rates above the Driftless median for adult and preferred-sized fish (Table 2).

The stream temperatures, flow and IBI scores for the lower stations were excellent but scored lower for available habitat for trout. The stream is well-buffered but is too wide and shallow with fine sediments from eroded banks resulting in scarce habitat for trout in many areas (Table 4). The upper station at Moyer/Ryan Road had reduced flows, limiting the stream from reaching its full potential in this headwater reach.

MOEN CREEK

Our survey for Moen Creek was limited to the single road crossing at Bergum Road near the confluence with Elvers Creek. Similar to Ryan Creek, Moen Creek had low catch rates of YOY and yearling Brown Trout, adult catch rates above the statewide median rate and higher catch rates of preferred-size fish (exceeding statewide and Driftless benchmarks >12, Table 2). In terms of physical characteristics, the water is cold (58°F), narrow, with decent habitat and IBI scores but with lower stream flows (Table 4).

BOHN CREEK

Bohn Creek is a rarity in Dane County in that Brook Trout dominate Brown Trout by a ratio of approximately 3:1. Though all three survey sites had YOY Brook Trout present, only the Bohn Road site exceed the Driftless median rate, and no yearlings were observed at any of the three sites (Table 3). For larger sized Brook Trout, the uppermost site had two fish over 10", but overall catch rates were generally low. Brown Trout catch rates are low across all sizes, but notably, some natural reproduction and yearling survival is occurring in this reach (Table 2). Brook Trout are maintaining a stronghold in this sub-watershed due to the narrow valley adjacent to the stream corridor with an excellent buffer of natural vegetation and forested lands. The healthy, vegetated and stable banks resulted in few areas of erosion and silt substrates and incision was scarce. The river offers a diversity of trout cover and habitats from small pools, riffles and runs and the headwater temperatures were cold (53°F, Table 4).

LITTLE NORWAY CREEK

Although unclassified trout water, the DNR purchased an easement along this small tributary of Bohn Creek, recognizing the importance of springs and small tributaries as groundwater protection areas. DNR trout surveys over the years have shown this area to be a limited trout fishery in terms of overall numbers and sizes of trout, and our 2019 survey was no different. We only sampled two YOY fish in our survey (Table 2), though we observed a handful of adults downstream in a culvert plunge pool not in our survey reach. The habitat and stream temperatures are all good in terms of trout habitat, but the fishery potential in this reach is limited by low stream flows (Table 4).

Discussion

Most stream segments within East Branch Blue Mounds, West Branch Blue Mounds and Moen creeks are performing as Class 2 fisheries and provide a Minimal Fishable population and anglers can expect to catch trout in these areas (e.g., over 80% of the stream reaches we surveyed contained >50 trout per mile). These streams have isolated reaches of spawning and YOY nursery habitats. Still, it's 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 is clear in reviewing natural YOY and yearling recruitment catch rates within the watershed. For example, Brown Trout YOY catch rates were low; only one station exceeded the statewide median catch rates. Yearling recruitment was similar; only 3 of 18 sampling locations had catch rates above statewide median rates (Table 2).

The trout abundances in Elvers Creek are high across all size classes and indicate a healthy self-sustaining Brown Trout fishery and should be upgraded to Class 1 trout waters from the current Class 2. In addition to having the highest abundances of trout observed in this watershed, average catch rates across all four stations exceeded the statewide median rate for YOY and the Driftless median rate for adult and preferred size classes (Table 2). With an average size of 9.5" (range 2.3-15.5"), anglers can expect to land a quality Brown Trout in this area with regularity. Similarly, Bohn Creek is a high performing Brook Trout stream, with high catch rates of YOY and survival of older age classes (Table 3). This stream should also be upgraded from Class 2 to Class 1 trout water.

Bohn and Ryan creeks should also be upgraded from Class 2 to Class 1 waters. Bohn Creek boasts a strong Brook Trout fishery with YOY, adult and total catch rates exceeding regional benchmarks with a minority population of Brown Trout. Ryan Creek had catch rates exceeding regional benchmarks in two of the four stations, and the highest quality trout waters were at the HWY F station. Here the yearling, adult, preferred and total catch rates exceeded statewide median benchmarks.

Though Little Norway was stocked in 2014, those Brook Trout have not resulted in a recreational fishery in this stream. However, the low trout population should not minimize the importance of this headwater stream as a vital groundwater protection area. Well-buffered, cold springs and small streams like Little Norway ensure cold, high-quality water inputs to the classified trout waters further downstream and should be enhanced and protected. At the other end of the stream order spectrum, main-stem Blue Mounds Creek currently does not have a high enough trout abundance to warrant upgrading to classified trout waters but does serve as an important overwinter area for trout. Along with the lower reaches of the West Branch and East Branch, these rivers 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 often hold low abundances of bigger fish.

Due to limited public access, stocking that has not produced quality angling opportunities or self-sustaining populations will be discontinued for most creeks in the watershed. For example, East Branch Mounds Creek and Ryan Creek have been stocked regularly but are underperforming in terms of total catch rates, and they have very limited access for anglers (i.e., road crossings). Additionally, Elvers Creek likely contributes fish to nearby and downstream rivers as those fish disperse. Moen Creek has not been stocked, and we have no plans to initiate a stocking program there, given the impounded headwaters and limited public access. West Branch Blue Mounds Creek will continue to be stocked with large fingerling Brown Trout, and we plan to reevaluate the efficacy of these products during the next sampling period. Since we do not stock Class 1 trout waters, Elvers and Bohn creeks will no longer be stocked when they are reclassified from Class 2 to Class 1 trout waters. Future assessments will reevaluate size-specific catch rates and the need for stocking this watershed as those data are collected and analyzed.

A major caveat to this report is the August 2018 flooding event. It is possible that the floods displaced or eliminated most of the young fish that year, which would have influenced the results of our survey in 2019 and the conclusions of this report. Additionally, frequent rains during the 2019 survey resulted in turbid, high water in some areas of the lower streams, which may also have reduced our ability to collect a robust sample in some stream reaches.

Though much of the watershed is dominated by clay substrates, we might observe a lag effect where the flood in 2018 exposed more gravel beds that trout now have access to as spawning habitat, thereby increasing natural reproduction in subsequent years. At the time of this writing, the 2021 Elvers Creek trend survey at HWY J showed very high YOY production, with 918 YOY per mile, which far exceeded the Driftless median rate of 136 YOY per mile. Catch rates of yearling (4-8") and adult (>8") trout were also much higher in 2021 (785 and 870 per mile, respectively), as were total catch rates of all trout (2,631 per mile). Additionally, the lack of yearling Brook Trout in the 2019 survey at Bohn Road, even though all other size classes were present, suggests the flood of 2018 impacted that year class significantly, but YOY production had resumed in 2019. If other streams in this report have performed similarly, abundance, reproduction and recruitment were likely better than our 2019 survey efforts indicate.

The watershed is comprised of larger land tracts of single ownership, and a select few new fishing easements would result in a substantial increase in publicly accessible waters. Investments in new easements or land acquisitions in areas like this are particularly valuable in Dane County, the fastest-growing county in the state. Current public access is limited in the watershed, and stream bank easements are

one of the few tools the DNR has to encourage and enable public use of the resource. DNR Fish Management and Dane County and Southwest Trout Unlimited, have invested substantial time and effort in recruiting interested landowners to enroll in a stream bank easement program. We encourage landowners to reach out to their local fish biologist (contact info on 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/>).

In addition to targeted easement outreach, establishing a formal DNR fishery area boundary around current remnant authority acquisitions and existing fee title lands, with newly formed boundaries for future potential acquisitions, would aid DNR staff in managing the trout fishery while providing additional public recreational lands in Dane County. Priority locations for easements and acquisitions should include the high performing areas outlined in this report but would also include any interested landowner along eligible streams. Increased public access with easements or fee title acquisitions are necessary first steps to utilize other funding sources to conduct comprehensive stream bank and in-stream trout habitat improvement projects in the watershed (e.g., DNR Trout Stamp Funds). The DNR will continue to partner with area conservation organizations to advance this important component of fisheries management and public access to fishing areas.

Large areas within the watershed could be improved from a trout habitat perspective. Though well-buffered, many of the habitat metrics need improvement, notably bank erosion and incision and fine sediment accumulation. There are few spawning riffles in the lower reaches, mostly comprised of incised, eroded banks with monotonous runs over compacted clay substrates with abundant areas with fine sediments. Improvements in these areas should attract adults looking for spawning redds in gravel riffles and offer juvenile trout nursery habitat with vegetated margins of the stream with overhead cover. Adult trout habitat initiatives should focus on improved habitat diversity within the river channels, including adding depth with pools and deeper runs, and riffle gravel complexes while maintaining overhead woody cover and riparian shade.

In addition to physical habitat limitations, invasive species like New Zealand mudsnails continue to colonize Wisconsin's trout streams. Established populations have been found in Elvers Creek and in the adjoining watershed of Black Earth Creek. 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 waterways. Freezing gear or robust disinfecting protocols (bleach, Vircon, steam, prolonged desiccation) are the best ways to be sure your gear is free of aquatic invasive species between trips.

Management Goals and Objectives

- 1) **Goal** – Increase public fishing access while improving trout habitat in the watershed
Objectives – Enroll at least 1 mile of stream bank easements or fee title acquisitions for public fishing access and complete at least ½ mile of stream bank improvement projects on newly acquired easements, fee title acquisitions or within existing lands.
Strategies – The DNR should continue to support and collaborate with local organizations such as Trout Unlimited, The Prairie Enthusiasts, Dane County and other willing partners in the region, including private landowners, to increase public access and awareness of the cold-water fishery in the watershed.
 - a) The DNR should establish a formal DNR Fishery Area around existing Remnant Authority Acquisition parcels in Elvers Creek.
 - i. Establish boundaries that align with existing tax parcels for future potential acquisitions during master planning process.
 1. Public lands or lands enrolled in public access programs like stream bank easements open the door for future stream bank and trout habitat improvement funds to be invested within the watershed because Trout Stamp funds can only be utilized on lands open to the public with easements or acquisitions.

- 2) **Goal** – Increase natural recruitment of Brown Trout on Class 2 waters of East Branch Blue Mounds, West Branch Blue Mounds and Moen creeks
Objectives – Increase yearling Brown Trout recruitment to 199 per mile (statewide Class 1 median) without additional stocking.
Strategy – Conduct habitat improvement project on newly acquired easements or lands

- 3) **Goal**- Increase natural recruitment of Brook Trout in Bohn Creek
Objectives – Increase yearling Brook Trout recruitment to 150 per mile (statewide median).
Strategy- Collaborate with local landowners, conservation organizations and government agencies to acquire easements or lands to increase buffer areas, encourage native vegetated riparian corridors and implement habitat improvement projects.
 - a. Improve habitat and water quality to increase survival and recruitment of naturally reproduced fish within the watershed with 1 mile of Trout Stamp funded habitat improvement projects addressing bank erosion, incision, lack of pool habitat and overhead cover.

ADDITIONAL MANAGEMENT RECOMMENDATIONS:

- 1) Reclassify Elvers Creek, Ryan Creek and Bohn Creek as Class 1 trout waters
- 2) Revisit trout classifications in 2025 rotation schedule for all other Class 2 streams

- a. West Branch Blue Mounds, East Branch Blue Mounds and Moen creeks are functioning as Class 2 systems and provide fishable populations in most locations.
 - b. Mainstem Blue Mounds Creek and Little Norway Creek contain trout, but low abundances do not provide fishable populations and they are appropriately not classified as trout waters.
- 3) Maintain harvest opportunities with current regulation of 8" minimum, three daily bag limit.
- 4) Evaluate angler-use and harvest within the watershed with angler creel survey.
- 5) Discontinue stocking in most of the watershed except West Branch Blue Mounds Creek (stock large fingerling Brown Trout) and evaluate survival and contribution to fishery next survey.

Tables and Figures

Table 1. Trout stocking in Bohn Creek, East Branch Blue Mounds Creek, Elvers Creek, Little Norway Creek and Ryan Creek 2014-2020.

Stream	Species	Age	2014	2015	2016	2017	2018	2019	2020
Bohn Creek	Brook	Large Fingerling	473	1043	1000	450		471	500
WBR Blue Mounds Creek	Brown	Small Fingerling	525	1334	1800	2100			2000
		Large Fingerling						2000	
E. Branch Blue Mounds Cr.	Brook	Broodstock			60				
	Brown	Large Fingerling						1000	500
		Small Fingerling			1000				
		Yearling			267				
	Rainbow	Broodstock			22	23		20	
Elvers Creek	Brown	Large Fingerling						500	
		Small Fingerling	750	1000	1174	862			
Little Norway Creek	Brook	Large Fingerling	189						
Ryan Creek	Brown	Large Fingerling	148	438	390	500		600	

Table 2. Brown Trout catch rates in 2019. Catch-per-unit-effort (CPUE) units are numbers of fish per electrofishing mile. Values shown in red indicate catch rates less than the statewide median CPUE values.

Stream	Station Name (site ID)	N	Mean Length (In)	<4" YOY CPUE	4-8" Yearling CPUE	>8"Adult CPUE	>12" Preferred CPUE	>15" Memorable CPUE	>18" Trophy CPUE	Total CPUE
Blue Mounds Creek	Sawle Rd. (43)	5	16.84	0.00	0.00	26.82	21.46	16.09	16.09	26.82
W.Br. Blue Mounds Cr.	HWY KK (44)	9	8.00	12.87	51.50	51.50	12.87	12.87	0.00	115.87
	Turnell Rd. (45)	4	11.28	0.00	9.47	28.40	9.47	9.47	0.00	37.87
	Frame Road (46)	8	12.31	0.00	7.59	53.14	22.77	15.18	7.59	60.73
E. Br. Blue Mounds Cr.	Lewis Rd. (47)	14	9.26	0.00	41.98	153.94	13.99	0.00	0.00	195.92
	Sutcliffe Rd. (39)	15	9.02	13.05	17.40	34.80	17.40	4.35	4.35	65.24
	HWY F (38)	77	9.68	17.64	97.00	224.87	88.18	17.64	0.00	339.51
Elvers Creek	Blue Mounds Trail (40)	41	9.27	32.19	75.10	332.60	42.92	0.00	0.00	439.89
	HWY JJ (41)	93	10.01	20.77	207.66	737.18	186.89	0.00	0.00	965.61
	HWY J (42)	155	9.05	151.47	312.40	1003.47	151.47	18.93	0.00	1467.34
	HWY JG (36)	28	9.63	13.99	83.97	293.88	41.98	13.99	0.00	391.84
Bohn Creek	Bohn Rd. (30)	6	10.02	0.00	30.65	61.31	15.33	15.33	0.00	91.96
	HWY JG (29)	5	9.12	0.00	32.19	48.28	16.09	0.00	0.00	80.47
	Andrew Lane (31)	2	5.90	16.09	0.00	16.09	0.00	0.00	0.00	32.19
Ryan Creek	HWY F (35)	51	8.18	51.50	321.87	283.24	90.12	0.00	0.00	656.61
	Shower Rd.(37)	30	9.65	32.19	112.65	337.96	128.75	0.00	0.00	482.80
	Moyer & Ryan Road (34)	12	8.97	24.76	24.76	99.04	24.76	0.00	0.00	148.55
Moen Creek	Bergum Rd.(32)	28	9.80	0.00	160.93	289.68	96.56	0.00	0.00	450.62
Statewide CPUE				119	199	206	48			537
Driftless CPUE				136	230	331	63			730

Table 3. Brook Trout catch rates in 2019. Catch-per-unit-effort (CPUE) units are numbers of fish per electrofishing mile. Values shown in red indicate catch rates less than the statewide median CPUE values.

Stream	Station Name (site ID)	N	Mean Length (In)	<4" YOY CPUE	4-7" Yearling CPUE	>7" CPUE	>10" Preferred CPUE	>12" Trophy CPUE	Total CPUE
Bohn Creek	Bohn Rd. (30)	26	5.94	199.25	0.00	199.25	15.33	15.33	398.50
	HWY JG (29)	9	7.16	48.28	0.00	96.56	16.09	0.00	144.84
	Andrew Lane (31)	3	7.87	16.09	0.00	32.19	32.19	0.00	48.28
Little Norway Creek	HWY JG Driveway (33)	2	2.80	32.19	0.00	0.00	0.00	0.00	32.19
Statewide CPUE				145	150	81	16.4		337
Driftless CPUE				129	81	81	16.1		220

Table 4. Coldwater index of biotic integrity (IBI) scores, temperature, flow, stream width and habitat scores for the Blue Mounds Creek watershed. Site ID reference Figure 1 and are listed in order from downstream to upstream.

Stream	Station (Site ID)	IBI Score	Temperature (°F)	flow (cfs)	Mean Stream Width (meters)	Habitat Score
Blue Mounds Creek	Sawle Rd. (43)	20	62	65.33	8.0	60
W.Br. Blue Mounds Cr.	HWY KK (44)	30	66	29.4	3.5	47
	Turnell Rd. (45)	10	65	30.45	4.6	42
	Frame Road (46)	60	64	22.75	5.4	52
E. Br. Blue Mounds Cr.	Lewis Rd. (47)	70	59	12.25	3.7	52
	Sutcliffe Rd. (39)	20	58	51.56	7.2	48
	HWY F (38)	40	58	50.85	6.8	48
Elvers Creek	Blue Mounds Trail (40)	40	58	34.61	4.2	63
	HWY JJ (41)	40	62	34.61	4.6	53
	HWY J (42)	70	60	29.66	4.4	53
	HWY JG (36)	70	60	9.89	3.0	53
Bohn Creek	Bohn Rd. (30)	80	65	7.77	3.0	67
	HWY JG (29)	90	54	2.83	2.3	58
	Andrew Lane (31)	90	53	1.41	2.0	67
Moen Creek	Bergum Rd.(32)	70	58	4.59	1.5	72
Little Norway Creek	HWY JG Driveway (33)	90	55	1.41	1.0	62
Ryan Creek	HWY F (35)	70	55	10.59	4.2	48
	Shower Rd.(37)	70	56	6.36	2.8	57
	Moyer Rd. & Ryan Road (34)	60	55	3.53	3.0	57
	Bike Trail Bridge in Park (28)	-	56	2.12	1.0	40

Table 5. Total catch rates for Mottled Sculpin and White Sucker, IBI scores and predicted stream natural community categories for the Blue Mounds Creek Watershed.

Stream	Station (Site ID)	IBI Score	Natural Community Prediction	Mottled Sculpin CPUE	White Sucker CPUE
Blue Mounds Creek	Sawle Rd. (43)	20	Cool-Cold Mainstem	5.00	5.00
West Br. Blue Mounds Creek	HWY KK (44)	30	Cool-Cold Mainstem	89.74	179.49
	Turnell Rd. (45)	10	Cool-Cold Mainstem	28.30	273.58
	Frame Road (46)	60	Cool-Cold Mainstem	90.91	0.00
	Lewis Rd. (47)	70	Cool-Cold Mainstem	140.85	0.00
East Br. Blue Mounds Creek	Sutcliffe Rd. (39)	20	Cool-Cold Mainstem	65.22	226.09
	HWY F (38)	40	Cool-Cold Mainstem	4.41	246.70
Elvers Creek	Blue Mounds Trail (40)	40	Cool-Cold Mainstem	118.28	182.80
	HWY JJ (41)	40	Cool-Cold Mainstem	72.92	468.75
	HWY J (42)	70	Cool-Cold Mainstem	198.11	56.60
	HWY JG (36)	70	Cool-Cold Headwater	211.27	0.00
Bohn Creek	Bohn Rd. (30)	80	Cool-Cold Headwater	723.08	0.00
	HWY JG (29)	90	Cool-Cold Headwater	209.68	0.00
	Andrew Lane (31)	90	Cool-Cold Headwater	16.13	0.00
Moen Creek	Bergum Rd.(32)	70	Cool-Cold Headwater	112.90	0.00
Little Norway Creek	HWY JG Driveway (33)	90	Coldwater	0.00	0.00
Ryan Creek	HWY F (35)	70	Coldwater	243.59	0.00
	Shower Rd.(37)	70	Coldwater	467.74	0.00
	Moyer Rd. & Ryan Rd. (34)	60	Coldwater	481.48	0.00
	Bike Trail Bridge in Park (28)	-		0.00	0.00

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

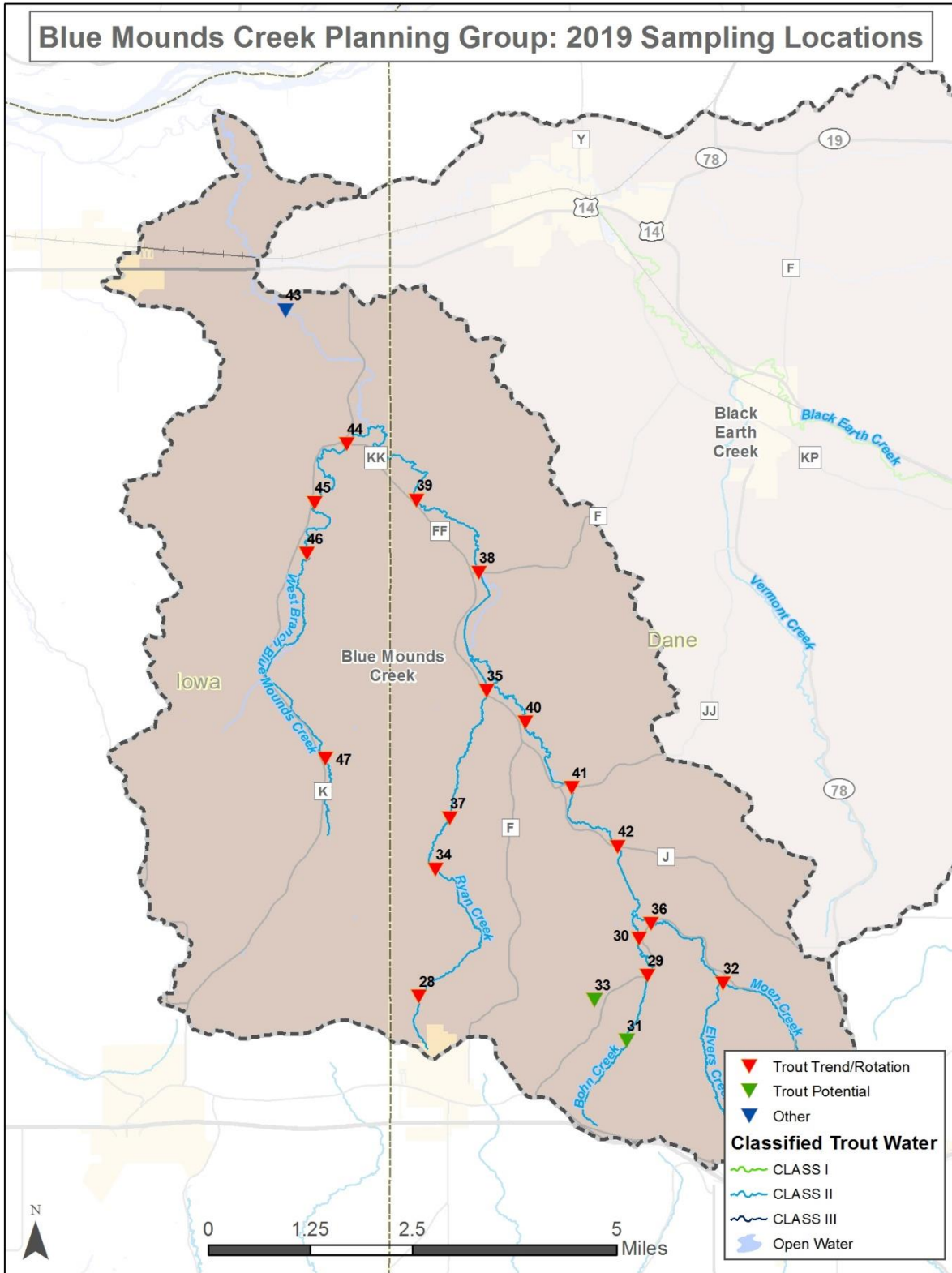


Figure 1. Stream classification and 2019 fishery assessment sampling sites within the Blue Mounds Creek Watershed.

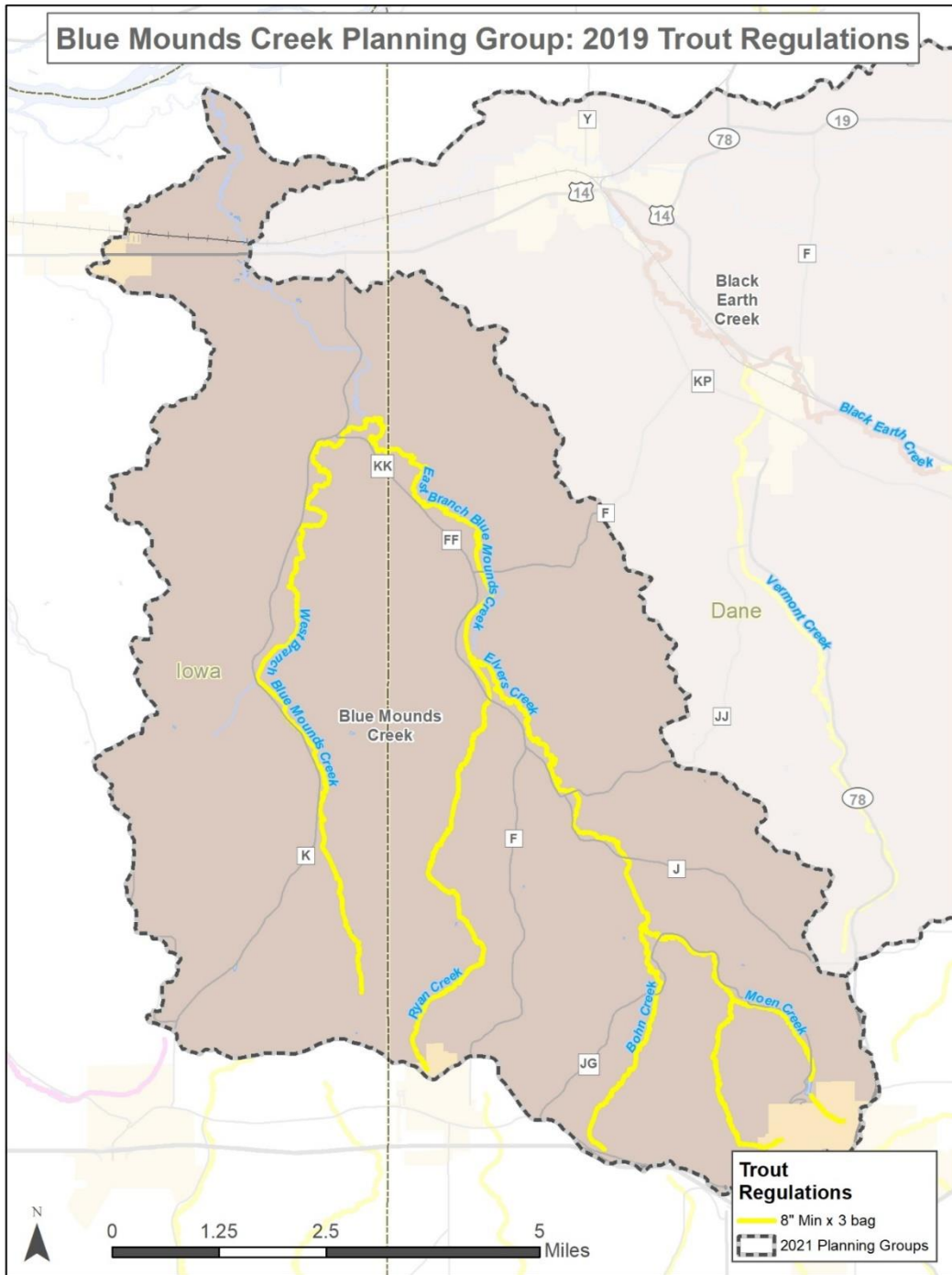


Figure 2. Blue Mounds Creek Watershed trout streams are regulated under the 8" minimum length and three daily-bag limit.

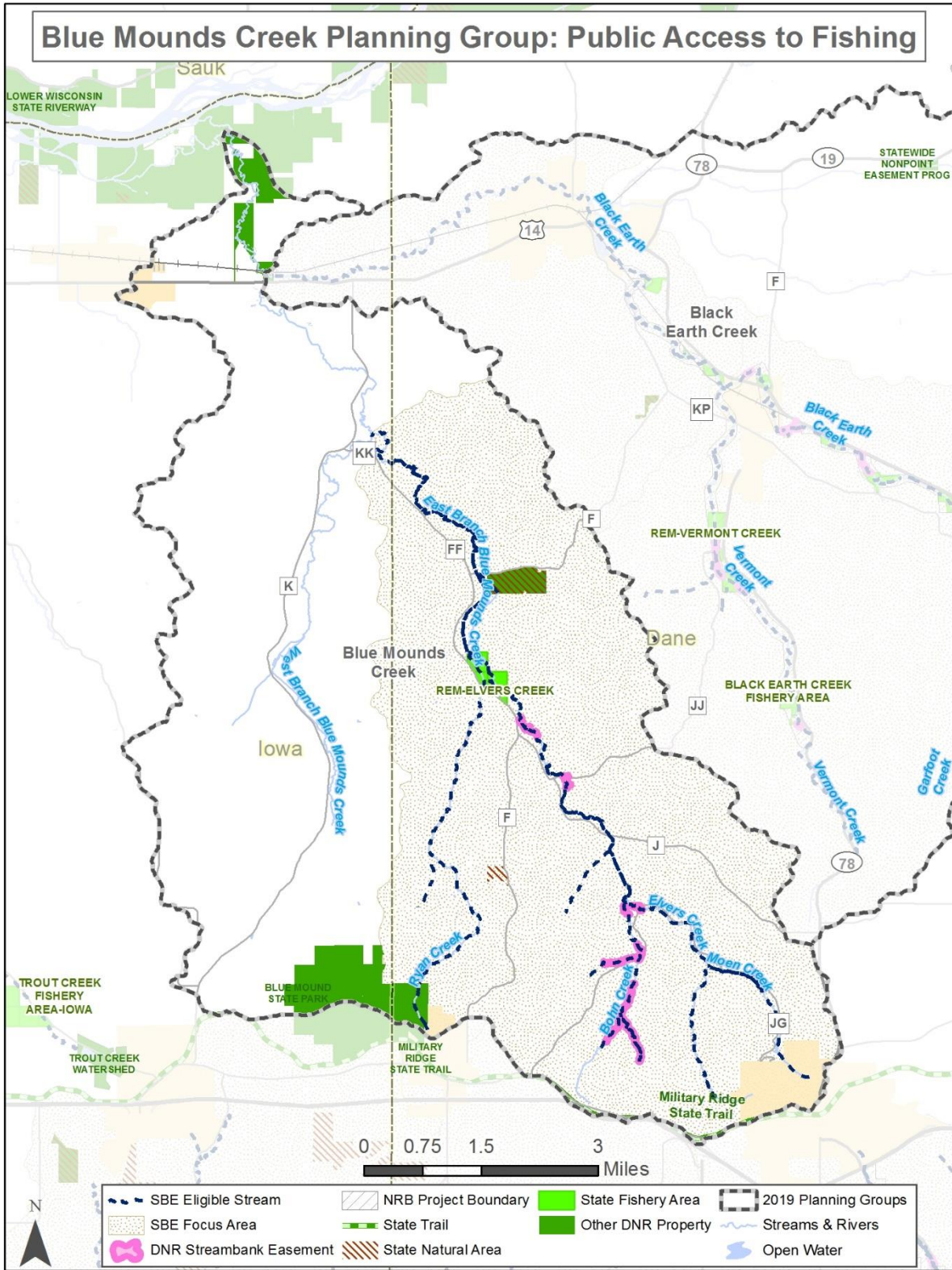


Figure 3. Blue Mounds Creek Watershed public access points and DNR Stream Bank Easement program waters.

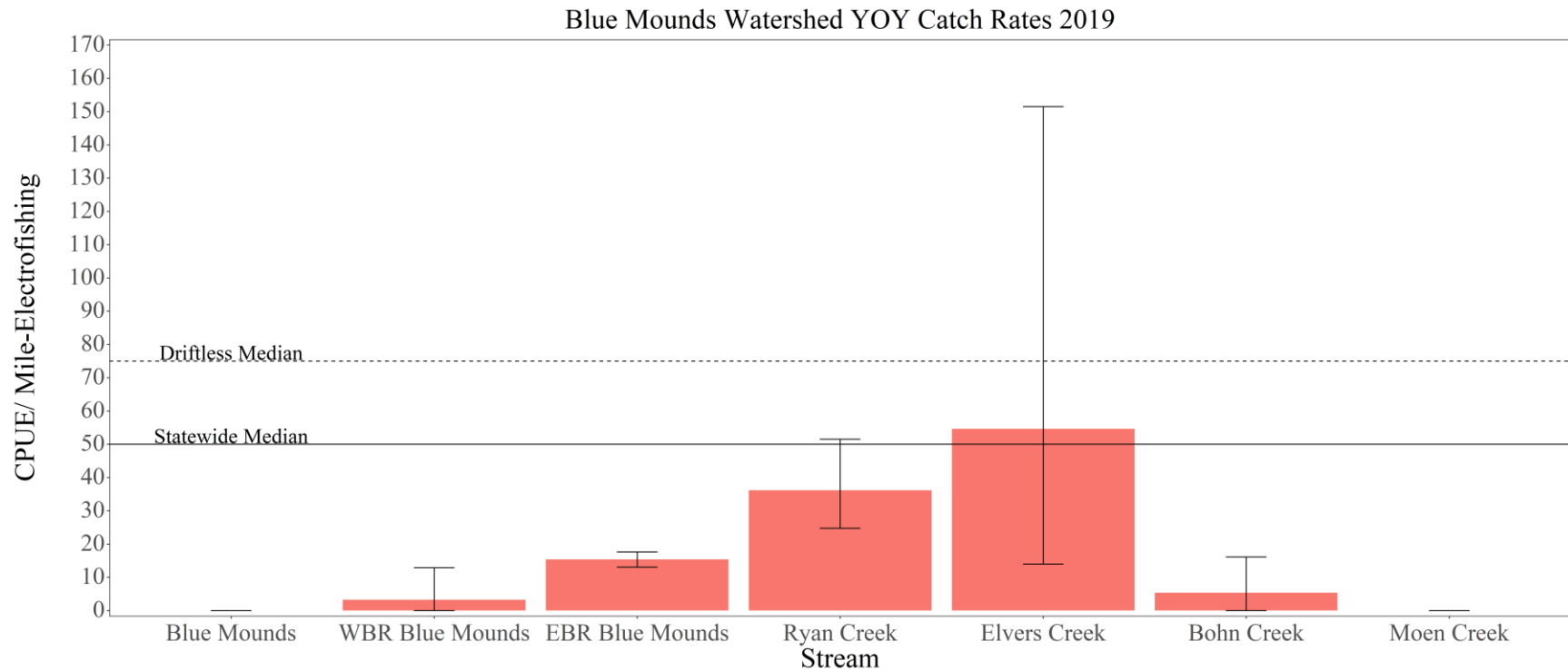


Figure 4. Average young-of-year Brown Trout catch rates (<4") across all survey sites for each stream. Error bars represent minimum and maximum trout per mile observed across all stations in each stream.

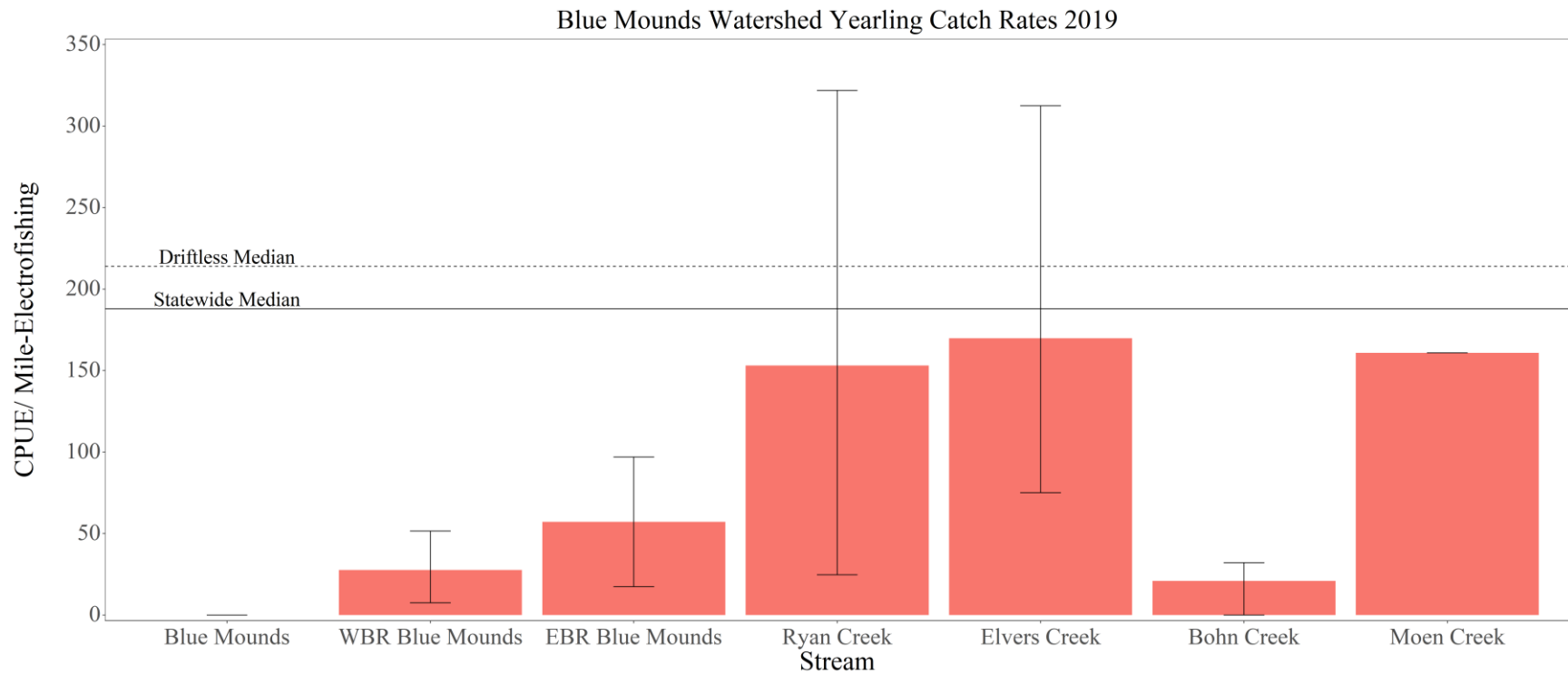


Figure 5. Average yearling Brown Trout catch rates (>4 & <8") across all survey sites for each stream. Error bars represent minimum and maximum trout per mile observed across all stations in each stream.

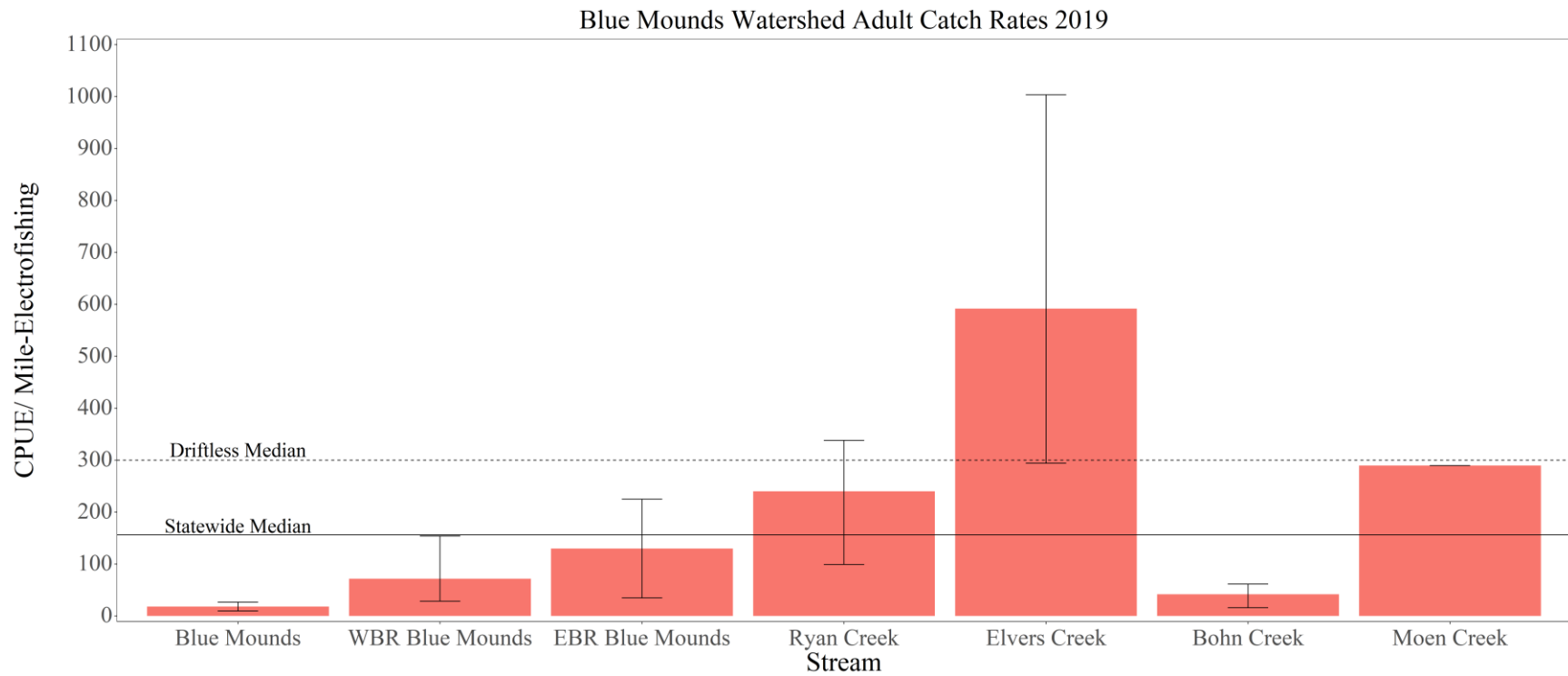


Figure 6. Average adult Brown Trout catch rates (>8") across all survey sites for each stream. Error bars represent minimum and maximum trout per mile observed across all stations in each stream.

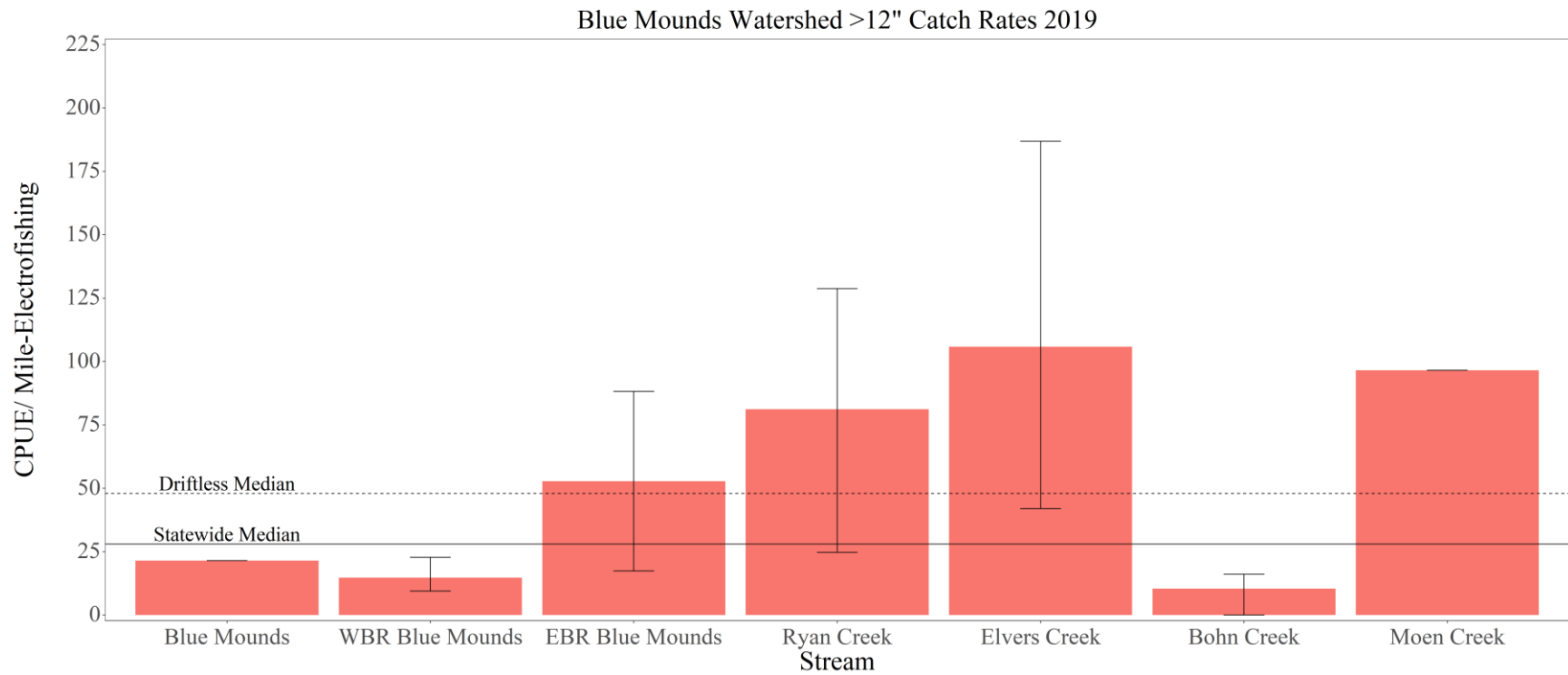


Figure 7. Average preferred Brown Trout catch rates (>12") across all survey sites for each stream. Error bars represent minimum and maximum trout per mile observed across all stations in each stream.

Elvers Creek @ HWY J

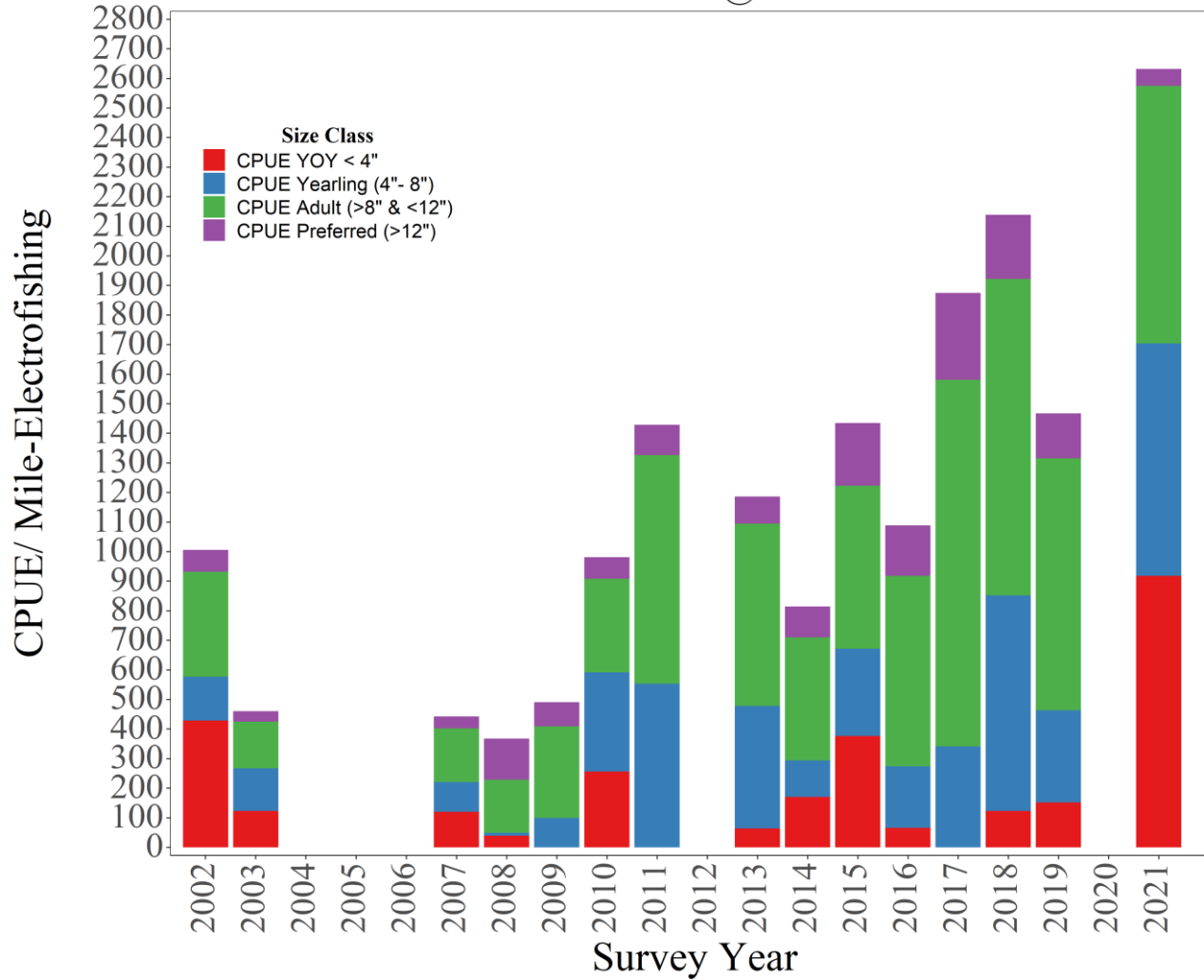


Figure 8. Size specific catch rates for Brown Trout in Elvers Creek at HWY J annual trend survey site. Years without data (2004, 2005, 2006, 2012, 2020) indicate no survey data available.