Part V:
Scoring Criteria for the Index of Biotic Integrity to Monitor Fish Communities in Wadeable Streams in the Coosa and Tennessee River Basins of the Blue Ridge Ecoregion of Georgia

Georgia Department of Natural Resources
Wildlife Resources Division
Fisheries Management Section

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Introduction

The Blue Ridge ecoregion (BRM), one of Georgia's six Level III ecoregions (Griffith *et al.* 2001), forms the boundary for the development of this fish index of biotic integrity (IBI). Encompassing approximately 2,639 mi^2 in northeast Georgia, the BRM includes portions of four major river basins — the Chattahoochee (CHT, 142.2 mi^2), Coosa (COO, 1257.5 mi^2), Savannah (SAV, 345.3 mi^2), and Tennessee (TEN, 894.2 mi^2) — and all or part of 16 counties (Figure 1). Due to the relatively small watershed areas and physical and biological parameters of the CHT and SAV basins within the BRM, and the resulting low number of sampled sites, IBI scoring criteria have not been developed for these basins. Therefore, only sites in the COO and TEN basins, meeting the criteria set forth in this document, should be scored with the following metrics.

The metrics and scoring criteria adopted for the BRM IBI were developed by the Georgia Department of Natural Resources, Wildlife Resources Division (GAWRD), Stream Survey Team using data collected from 178 sample sites by GAWRD within the COO (109 sites) and TEN (69 sites) basins. Fish communities in streams with watershed areas less than one square mile cannot be assessed using this SOP due to inherently low diversity within headwater streams. Benthic macroinvertebrate assessments may serve as an alternate biological assessment tool for these streams. Available at: (https://epd.georgia.gov/macroinvertebrate-bioassessment-standard-operating-procedures-sop-and-metric-spreadsheets).

The GAWRD collected a total of 90 of the 121 species known to inhabit wadeable BRM streams in the COO and TEN basins (Appx. 1). A total of 27 state listed species have been collected in the Ridge and Valley ecoregion (Table 1). The state listed fish collected in the Ridge and Valley ecoregion are ranked as endangered (E), threatened (T), or rare (R) based on the Endangered Wildlife Act of 1973 (GAWRD, Wildlife Conservation Section; http://georgiabiodiversity.org/, 2019).

Inherent differences in species richness warranted separate scoring criteria for the COO and TEN basins. Scoring information related to tolerance rankings, feeding guilds, and species categories are included in (Appx. 1). Table 2 shows the scoring criteria developed for the thirteen BRM IBI metrics (for metric descriptions refer to Part I,). Maximum Species Richness (MSR) graphs are included in (Appx. 1).

Scores for the BRM IBI ranged from 12 to 56 with a median of 34. Based on IBI classes (GAWRD 2019, pg 36), 14 (12 COO, 2 TEN) sites ranked EXCELLENT, 46 (29 COO, 17 TEN) ranked GOOD, 51 (31 COO, 20 TEN) ranked FAIR, 43 (21 COO, 22 TEN) ranked POOR, and 24 (16 COO, 8 TEN) ranked VERY POOR. Fish abundance data was standardized for each site, and sites were grouped based on community similarities. We used Primer 6.0 statistical software for ecological data to determine Bray Curtis similarities between sites (Clarke and Gorley 2001; Clarke and Warwick 2006). We categorized each site by basin and IBI class as determined by the metrics presented here, and averaged fish community data across these categories. Figure 2 illustrates the relative ability of the current metrics to separate sites based on fish community health.

Regional Diversity

High elevation and high gradient watersheds are common in the BRM, and fish diversity is relatively high when compared to other ecoregions in Georgia. However, some BRM streams represent unique systems where high elevation effects (e.g., cooler water temperatures, widely fluctuating flows, and steep gradient) pose insurmountable barriers to colonization by many fishes. These characteristics are common in high elevation streams throughout the Appalachian Mountains and often result in low fish diversity. Therefore, 27 COO and TEN sites were excluded from this analysis in addition to the BRM sites located in the CHT and SAV basins. We designated these 27 sites as high-elevation/trout-dominated (HETD) streams.

The IBI is designed to assess biotic integrity through the use of fish community metrics representing species richness, species composition, trophic composition, and fish abundance and condition (Fausch et al 1984). Due to the low diversity of the HETD streams, the attributes of fish communities represented in this BRM IBI are not appropriate for assessing biotic integrity of HETD streams. Criteria for using this BRM IBI, based on river basin, elevation, number of native species, and trout population characteristics, are presented in (Table 4). Fish samples not meeting these criteria should be assessed using alternative methods.

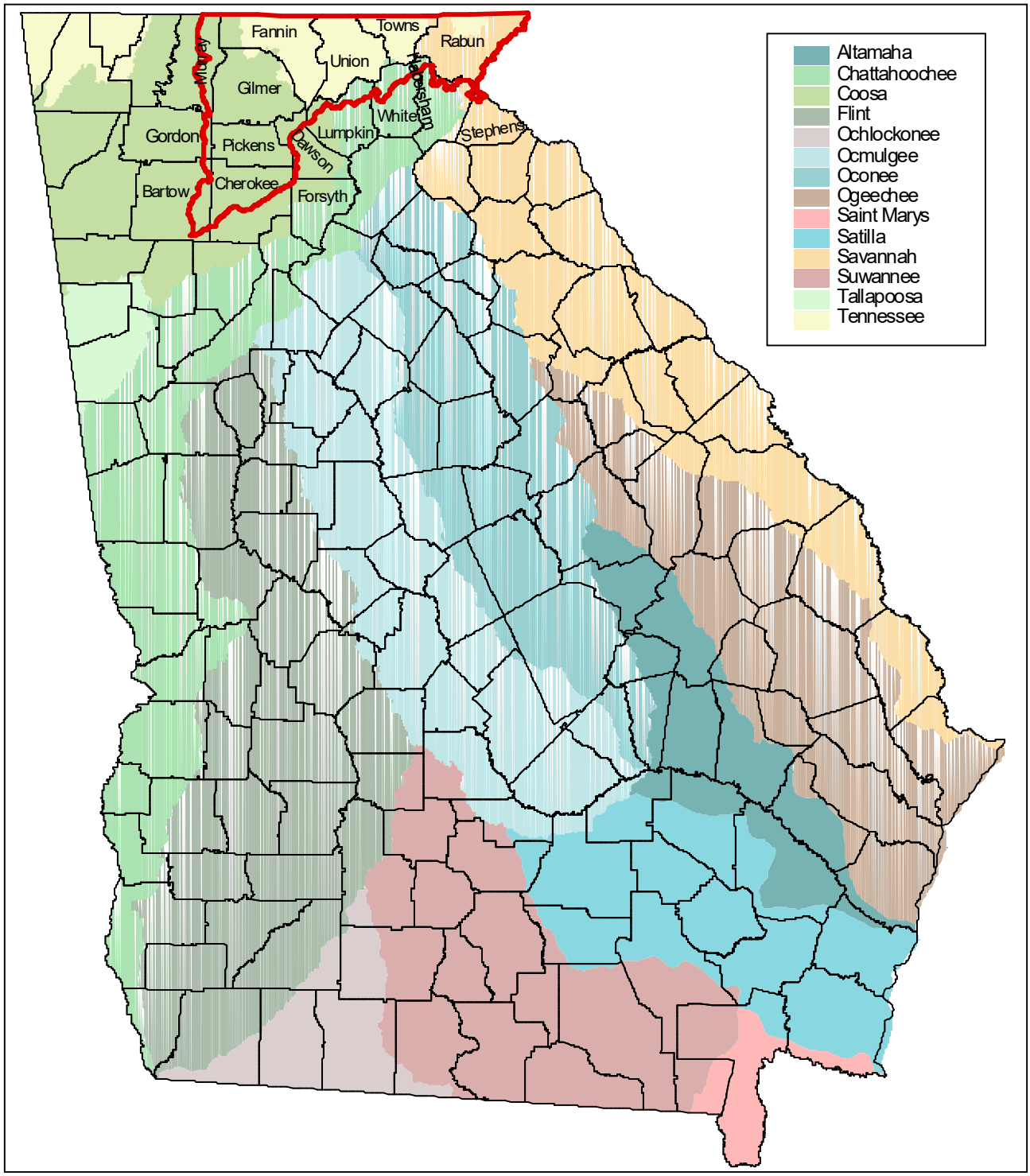

Figure 1. Level III Blue Ridge ecoregion (outlined in red) in Georgia. Major river basins include the Chattahoochee, Coosa, Savannah, and Tennessee

Table 1. State listed fish found in the Coosa and Tennessee portions of the Blue Ridge ecoregion of Georgia (GAWRD, Wildlife Conservation Section; http://georgiabiodiversity.org/, 2019).

Species	State	Federal	Basin
Blue shiner (*Cyprinella caerulea*)*	E	T	COO
Blotched chub (*Erimystax insignis*)*	E		TEN
Holiday darter (*Etheostoma brevirostrum*)*	E		COO
Greenfin darter (*Etheostoma chlorobranchium*)*	T		TEN
Etowah darter (*Etheostoma etowahae*)*	E	E	COO
Rock darter (*Etheostoma rupestre*)	R		COO
Cherokee darter (*Etheostoma scotti*)*	T	T	COO
Wounded darter (*Etheostoma vulneratum*)	E		TEN
Lined chub (*Hybopsis lineapunctata*)*	R		COO
Coosa chub (*Macrhybopsis etnieri*)	E		COO
River redhorse (*Moxostoma carinatum*)*	R		COO/TEN
Sicklefin redhorse (*Moxostoma* sp. sicklefin redhorse)	E	C	TEN
Burrhead shiner (*Notropis asperifrons*)*	T		COO
Highscale Shiner (*Notropis hypsileps*)	R		COO
Silver shiner (*Notropis photogenis*)	E		TEN
Sandbar Shiner (*Notropis scepticus*)	R		COO
Frecklebelly Madtom (*Noturus munitus*)	E		COO
Amber Darter (*Percina antesella*)	E	E	COO
Tangerine darter (*Percina aurantiaca*)	E		TEN
Goldline darter (*Percina aurolineata*)*	E	T	COO
Halloween Darter (*Percina crypta*)	T		COO
Conasauga Logperch (*Percina jenkinsi*)	E	E	COO
Bridled darter (*Percina kusha*)*	E		COO
Freckled Darter (*Percina lenticula*)	E		COO
Dusky darter (*Percina sciera*)	R		TEN
Olive darter (*Percina squamata*)	E		TEN

Status: E = endangered; R = rare; T = threatened; C = candidate
Basin: COO = Coosa; TEN = Tennessee
*Collected by GAWRD-SST

Table 2. Index of Biotic Integrity metrics for wadeable streams within the Coosa and Tennessee portions of the Blue Ridge ecoregion of Georgia, that are not high-elevation, trout-dominated (see Table 4). Scoring criteria include slopes of each trisection line (and coordinates where slope of trisection line becomes zero) for metrics 1 – 6 and numerical breaks for metrics 7 - 13.

Metric	Basin Group	Scoring Criteria	
Species Richness Metrics		5/3 Breaks	3/1 Breaks
1. Number of native species	COO	y = 12.34x + 4.43 (1.55, 23.5)	y = 8.93x + 3.21 (1.55, 17.0)
	TEN	y = 11.51x + 1.90 (1.33, 17.2)	y = 8.99x + 1.48 (1.33, 13.5)
2. Number of benthic fluvial specialist species	COO	y = 3.77x + 0.94 (1.55, 6.8)	y = 2.54x + 0.64 (1.55, 4.6)
	TEN	y = 3.68x – 0.45 (1.12, 3.7)	y = 2.34x – 0.29 (1.12, 2.3)
3. Number of native sunfish species[a]	COO	y = 0.73x + 1.29 (1.89, 2.7)	y = 0.36x + 0.65 (1.89, 1.3)
	TEN	y = 2.87x – 0.24 (1.01, 2.7)	y = 1.43x – 0.12 (1.01, 1.3)
Number of native centrarchid species[b]	COO	y = 3.28x + 1.00 (1.24, 5.1)	y = 2.04x + 0.62 (1.24, 3.2)
	TEN	y = 2.57x + 0.18 (1.23, 3.3)	y = 1.28x + 0.09 (1.23, 1.7)
4. Number of native insectivorous cyprinid species	COO	y = 3.69x + 0.19 (1.21, 4.7)	y = 1.85x + 0.10 (1.21, 2.3)
	TEN	y = 3.81x – 0.52 (1.36, 4.7)	y = 1.91x – 0.26 (1.36, 2.3)
5. Number of native round-bodied sucker species	COO	y = 2.36x + 0.44 (1.41, 3.8)	y = 1.59x + 0.30 (1.41, 2.5)
	TEN	y = 2.16x – 0.24 (1.54, 3.1)	y = 1.53x – 0.17 (1.54, 2.2)
6. Number of sensitive species[a]	COO	y = 2.51x – 0.27 (1.17, 2.7)	y = 1.25x – 0.13 (1.17, 1.3)
	TEN	y = 2.84x + 0.16 (1.12, 3.3)	y = 1.42x + 0.08 (1.12, 1.7)
Number of intolerant species[b]	COO	y = 3.34x – 1.44 (2.23, 6.0)	y = 1.67x – 0.72 (2.23, 3.0)
	TEN	y = 4.56x – 1.76 (1.12, 3.3)	y = 2.28x – 0.88 (1.12, 1.7)

Table 2 continued.

Metric	Basin Group	Scoring Criteria		
Species Composition Metrics		5	3	1
7. Evenness	COO	≥ 73.8	≥ 63.9 – 73.8	< 63.9
	TEN	≥ 70.6	≥ 57.3 – 70.6	< 57.3
8. % of individuals as *Lepomis* species	COO	≤ 10.5	≤ 21.1 – 10.5	> 21.1
	TEN	≤ 6.8	≤ 13.5 – 6.8	> 13.5
9. % of individuals as insectivorous cyprinids	COO	≥ 30.7	≥ 15.3 – 30.7	< 15.3
	TEN	≥ 28.8	≥ 14.4 – 28.8	< 14.4
10. % of individuals as generalist feeders and herbivores[a]	COO	≤ 40.6	≤ 68.0 – 40.6	> 68.0
	TEN	≤ 53.7	≤ 72.6 – 53.7	> 72.6
% of individuals as top carnivores[b]	COO	≥ 8.0 – ≤ 19.8	≥ 4.0 – 8.0	< 4.0
			> 19.8 – ≤ 23.8	> 23.8
	TEN	≥ 9.2 – ≤ 23.1	≥ 4.6 – 9.2	< 4.6
			> 23.1 – ≤ 27.7	> 27.7
11. % of individuals as benthic fluvial specialists	COO	≥ 50.8	≥ 26.7 – 50.8	< 26.7
	TEN	≥ 60.9	≥ 39.9 – 60.9	< 39.9
Abundance and condition metrics				
12. Number of individuals per 200 meters	COO	≥ 726.1	≥ 399.7 – 726.1	< 399.7
	TEN	≥ 724.8	≥ 411.3 – 724.8	< 411.3
13. % of individuals with external anomalies	COO/TEN	> 0.5 subtract 4 points from total score		

[a] used at sites with an upstream drainage basin area < 15 square miles
[b] used at sites with an upstream drainage basin area ≥ 15 square miles

Figure 2. Multidimensional scaling ordination plot of average Bray Curtis similarities for Coosa (COO) and Tennessee (TEN) basins. Sites are grouped by fish community similarities and averaged across basin and IBI class.

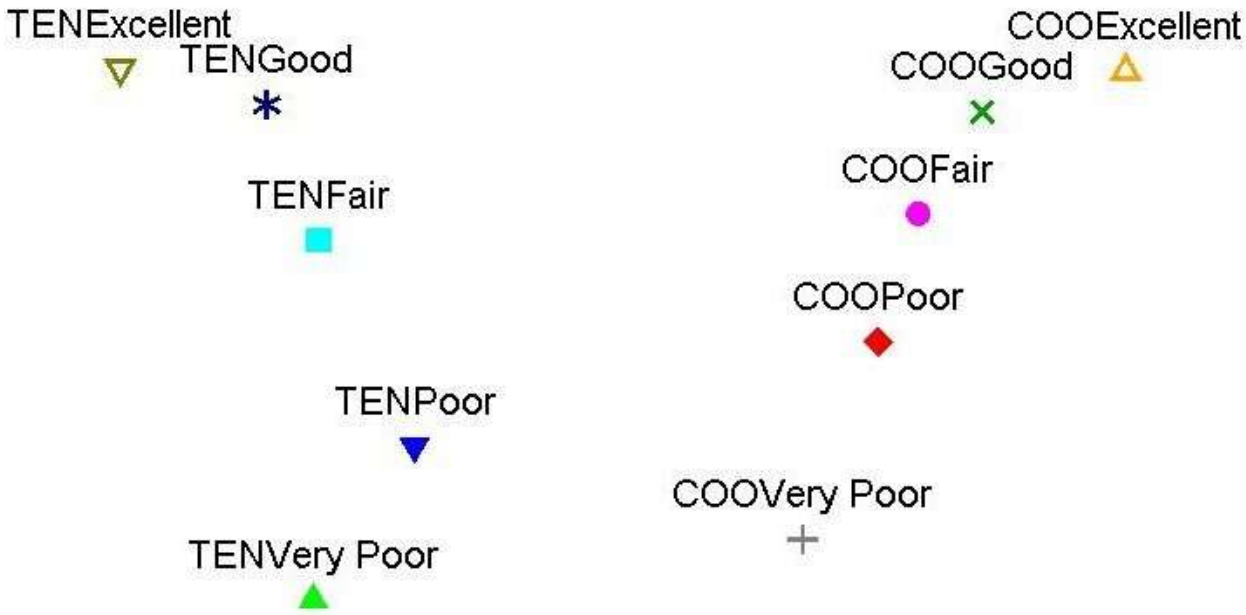

Table 4. Criteria for determining if streams in the Blue Ridge ecoregion (BRM) of Georgia should be scored using the index of biotic integrity (IBI) described in this document. **Sites meeting all of the components of criteria 1 OR criteria 2 should not be scored using the BRM IBI outlined in this document.**

Criteria	Elevation	DBA (mi^2)	Number Native Species	% Trout by Number
1	> 1400' (COO) > 1800' (TEN)	< 15	≤ 5	≥ 20%
2	≥ 50% Trout by Weight			

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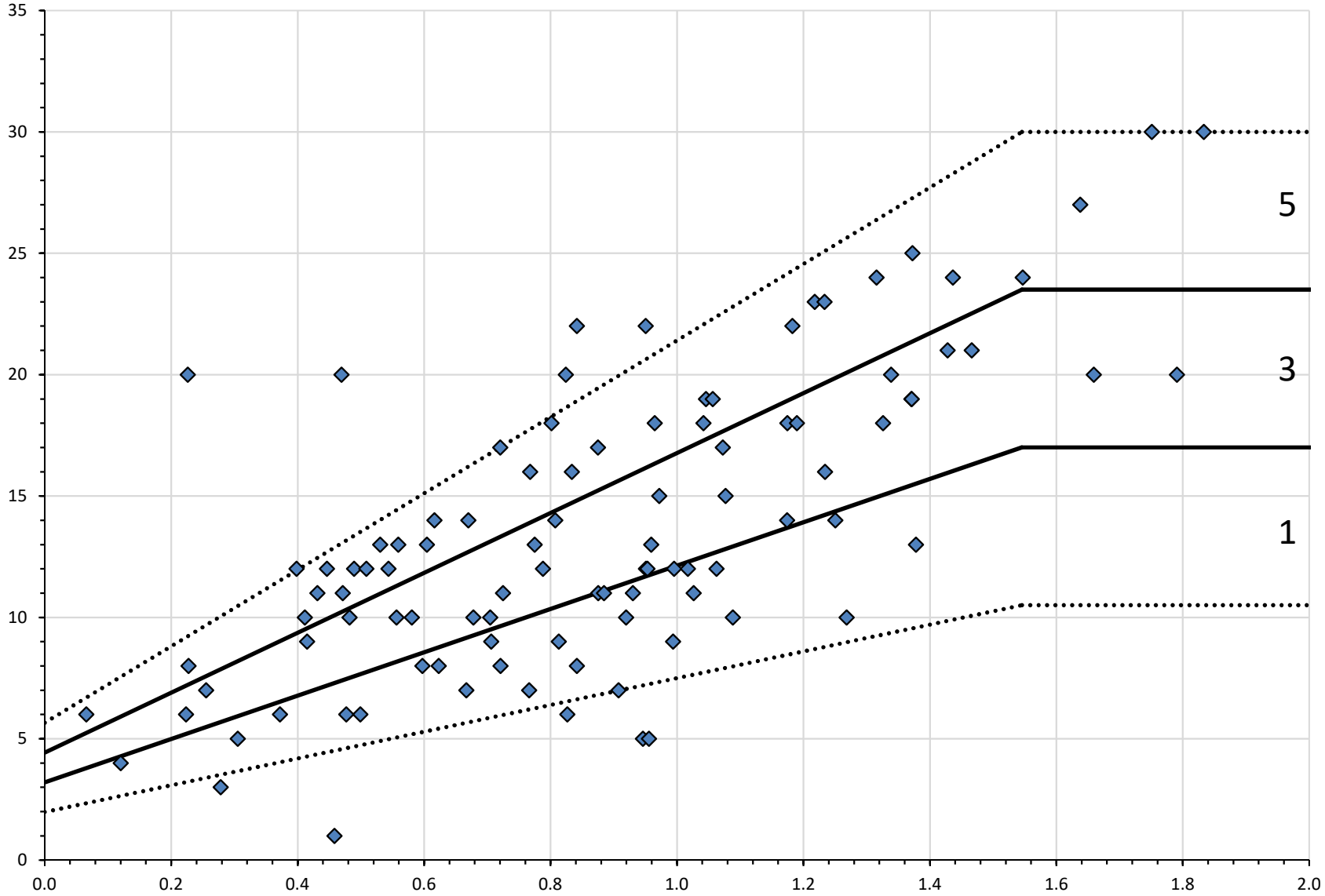
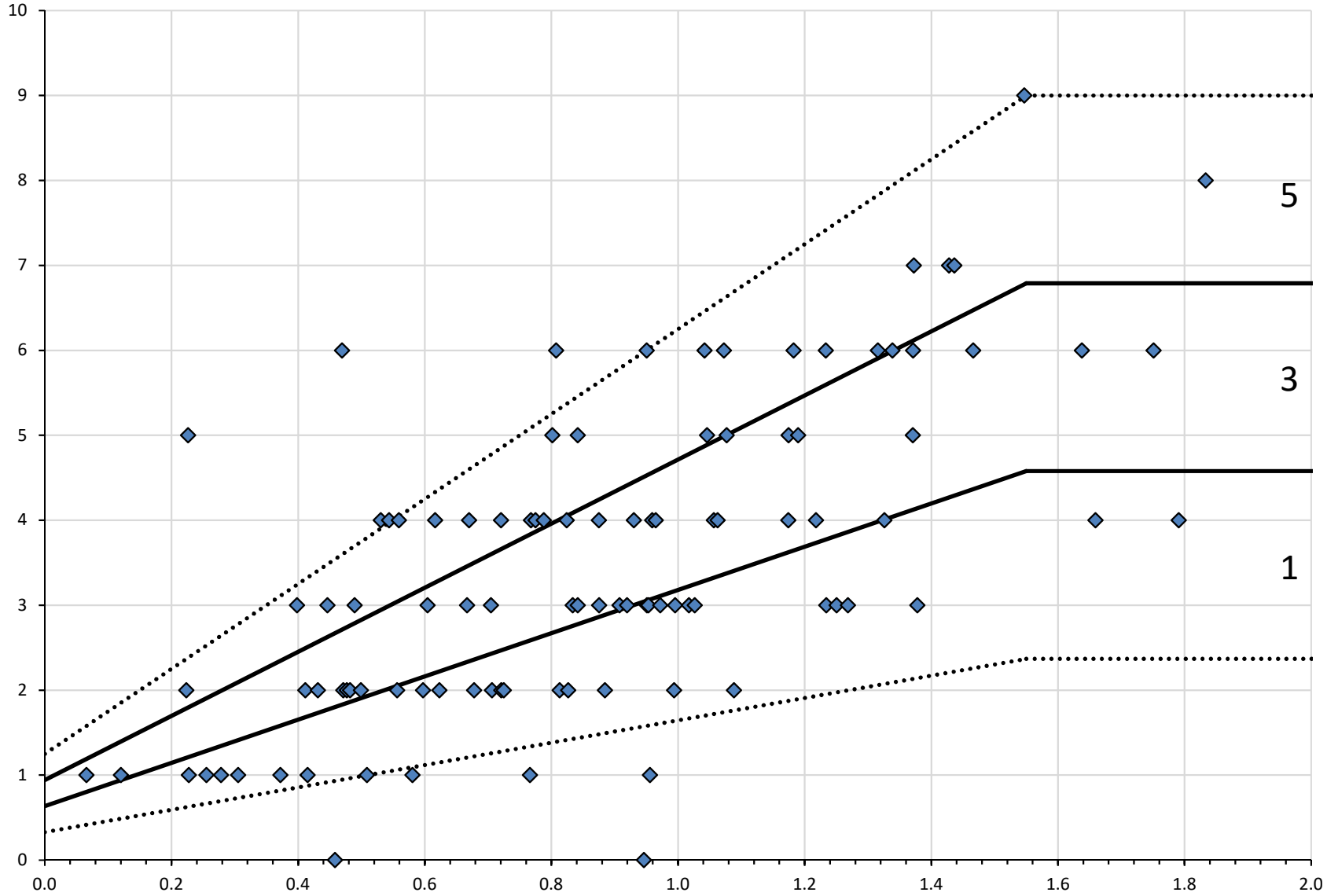
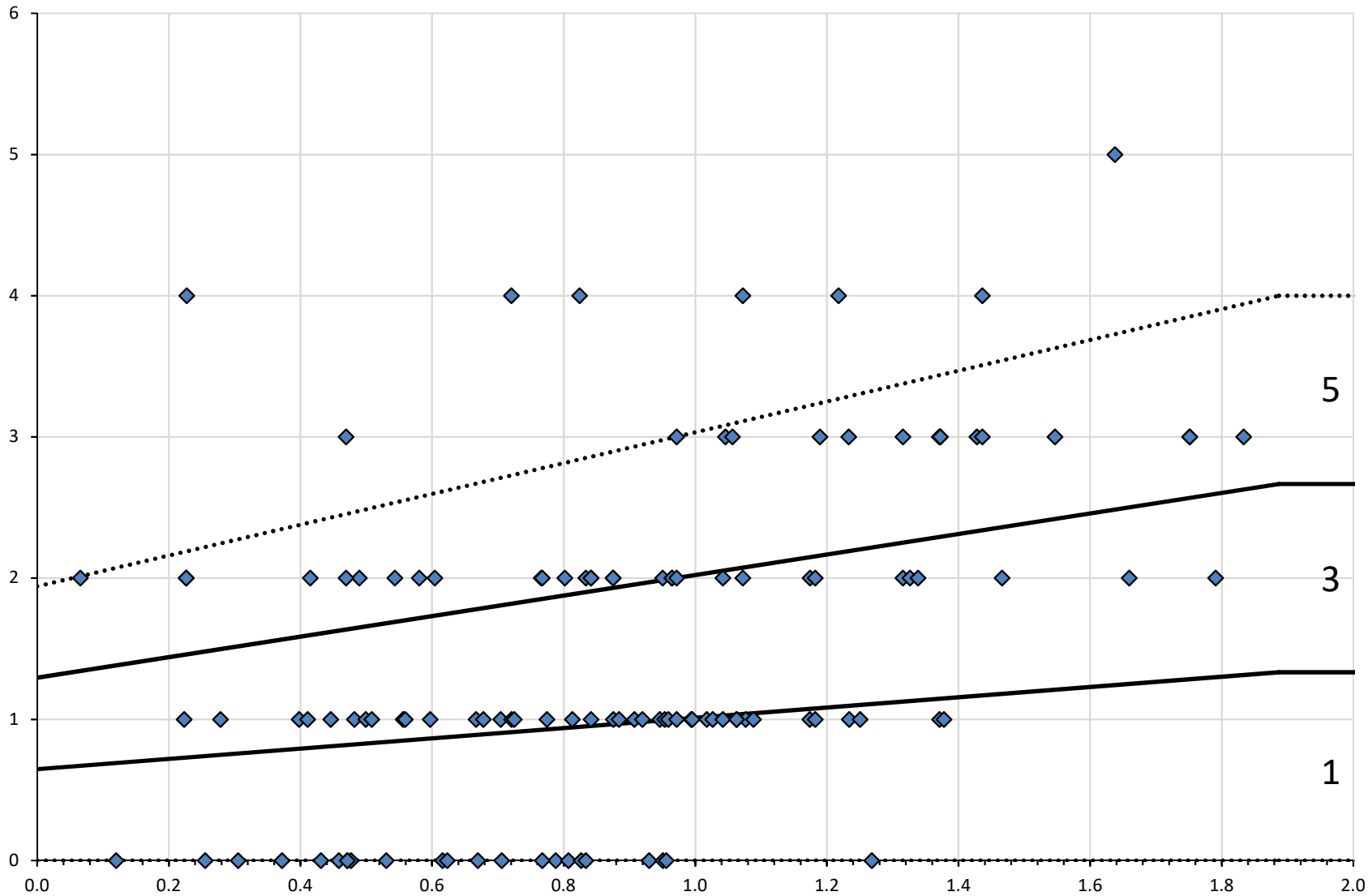
Appendix 1



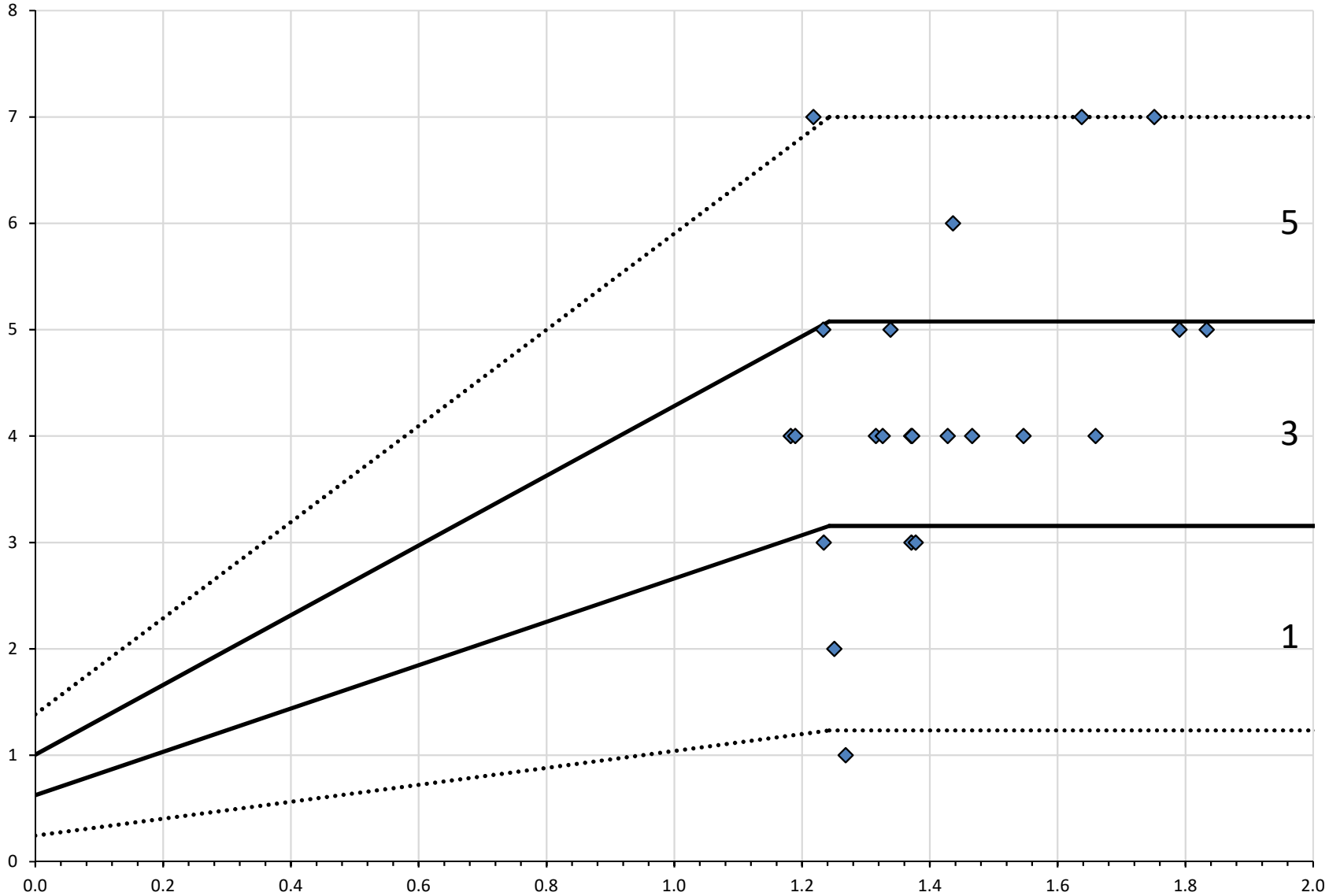
ACT1 - BRM. Total number of species in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



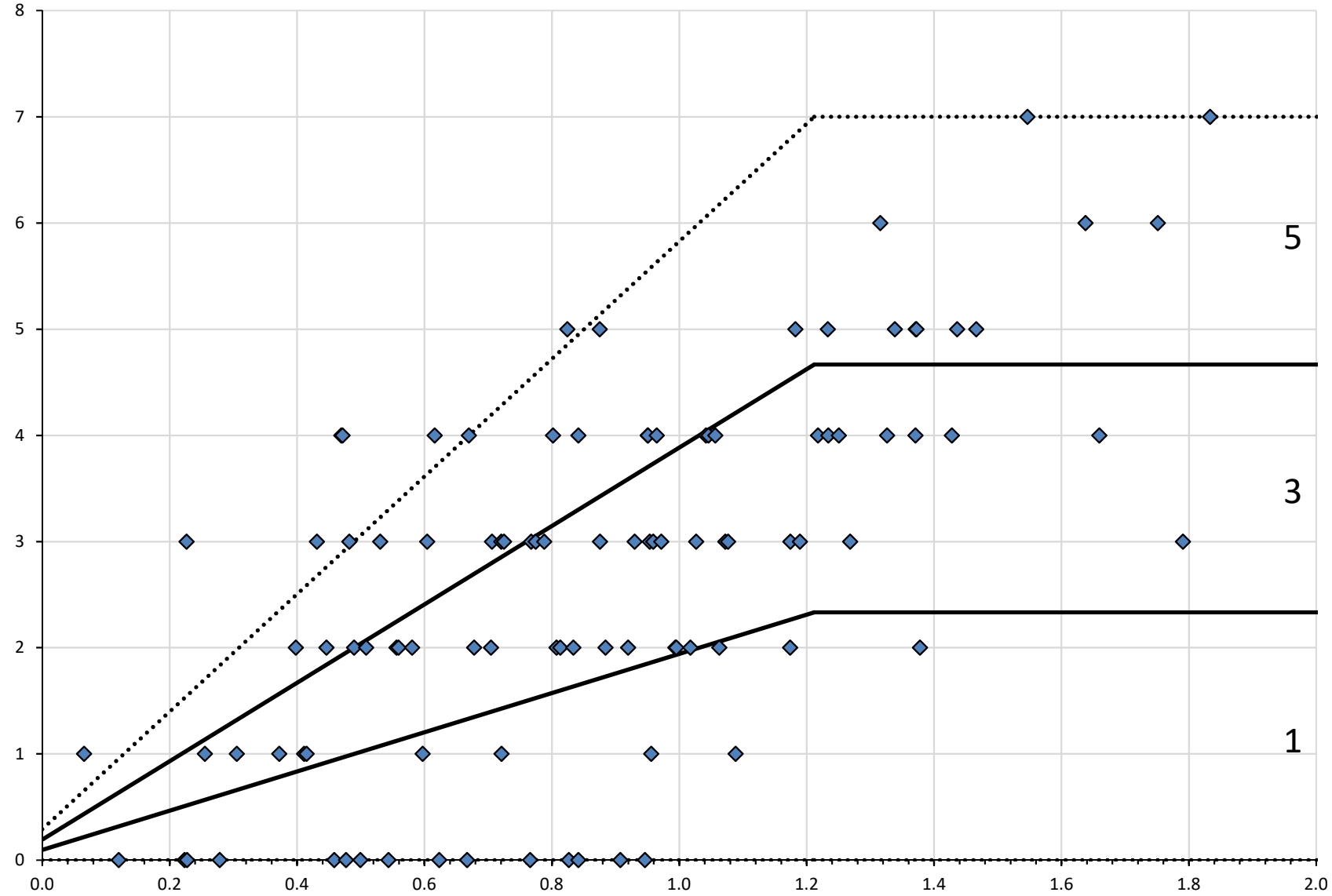
ACT2 - BRM. Number of benthic invertivore species in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



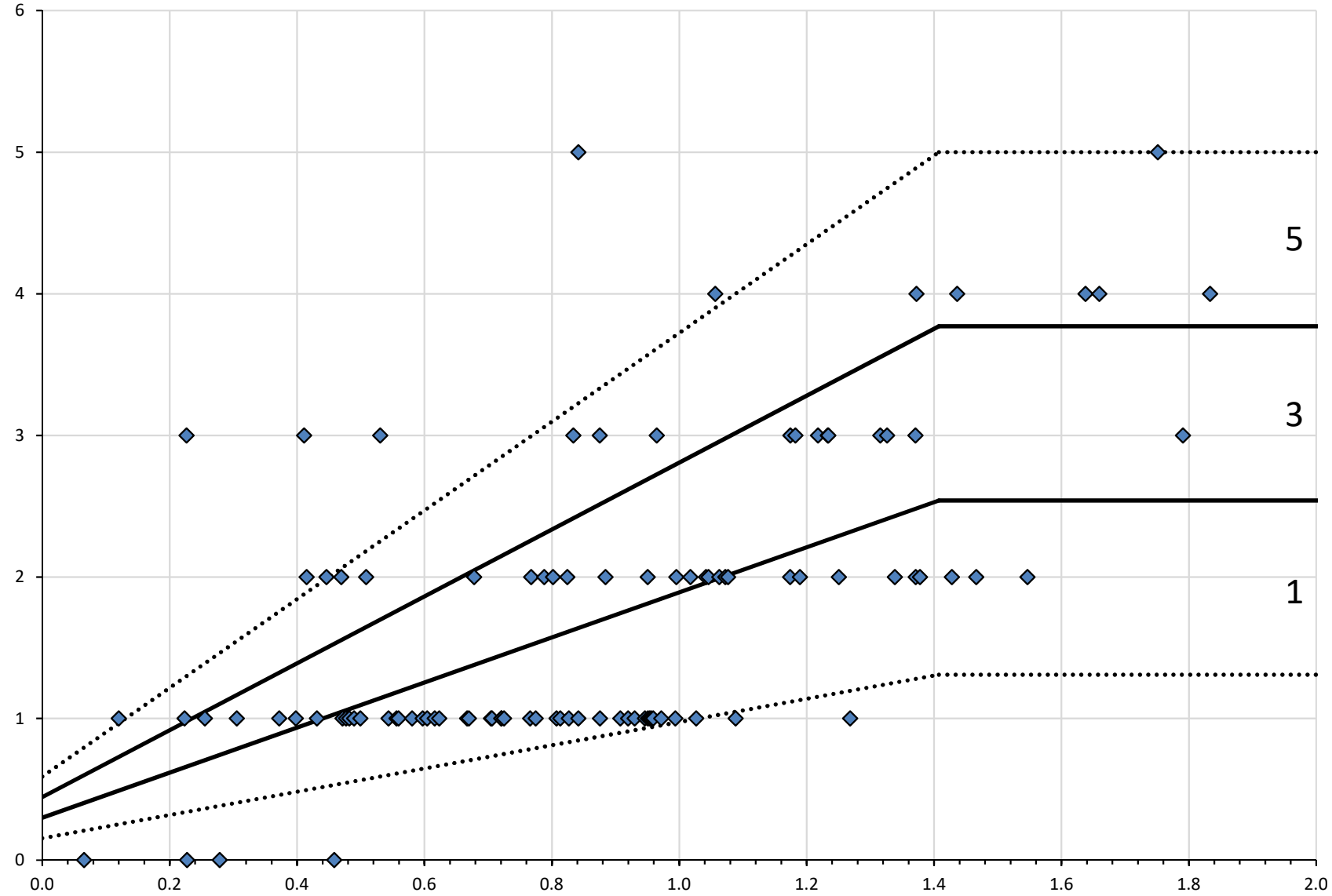
ACT3a - BRM. Number of native sunfish species in headwater streams (<15 square miles drainage basin area) in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



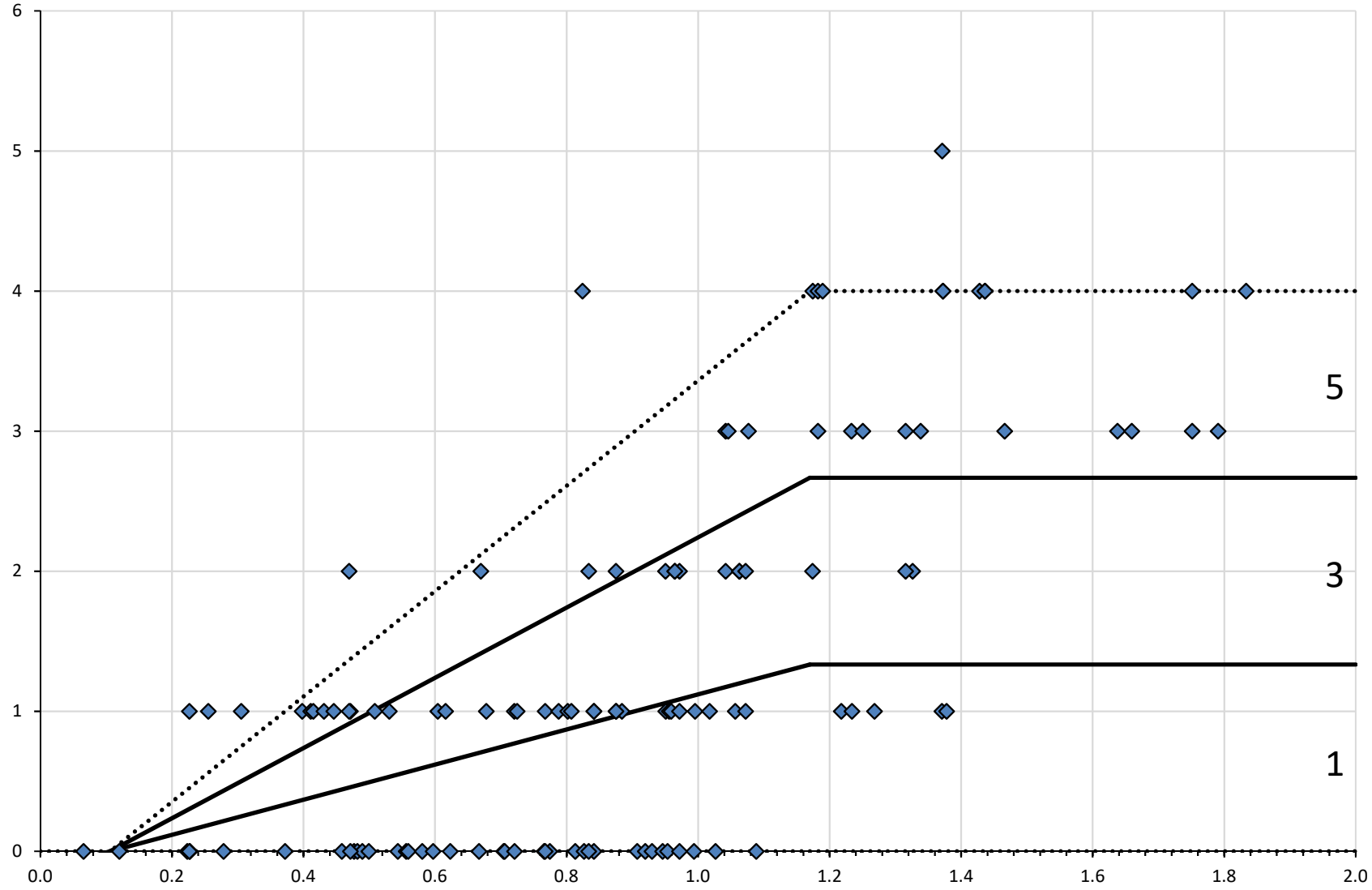
ACT3b - BRM. Number of native centrarchid species in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



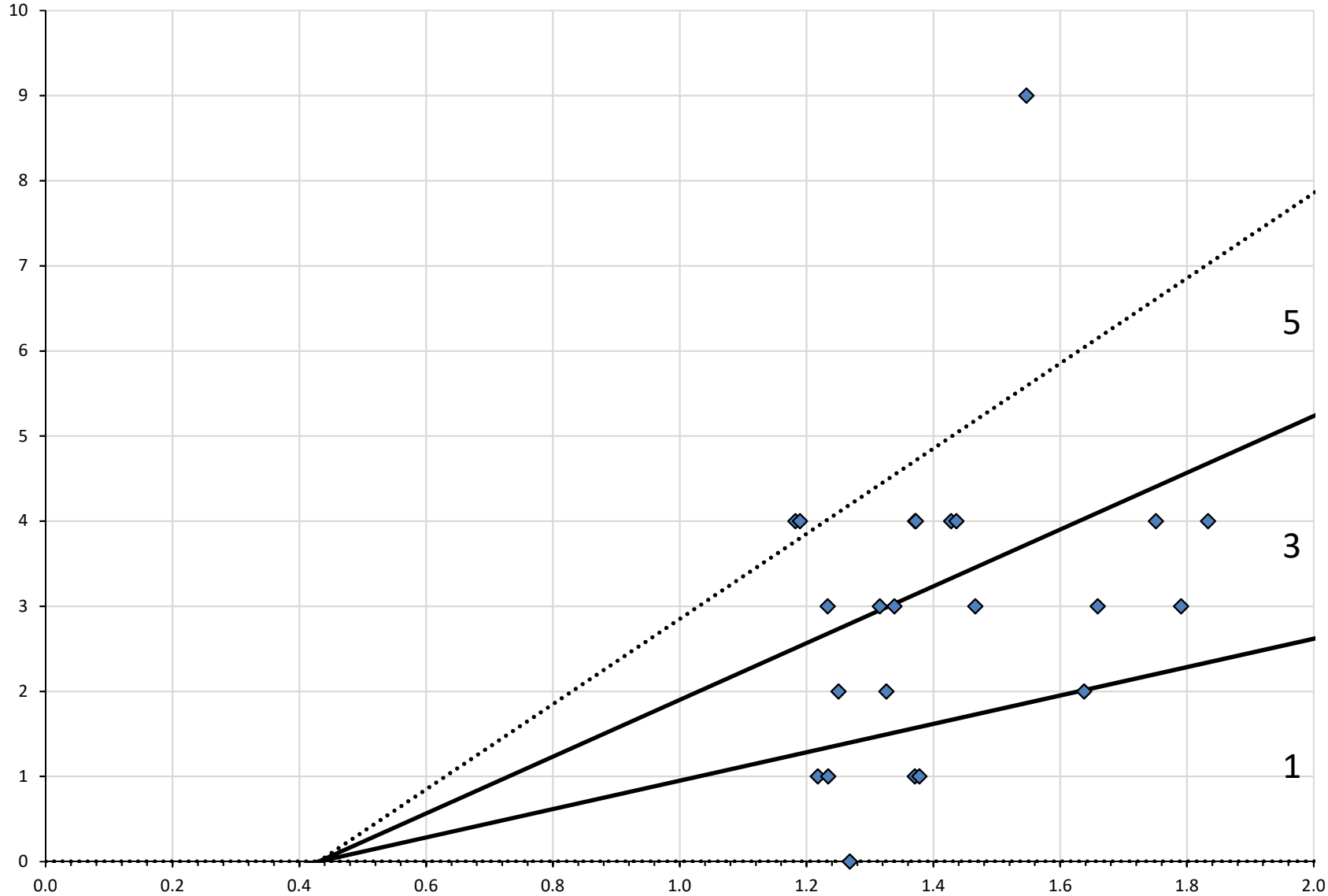
ACT4 - BRM. Number of native insectivorous cyprinid species in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



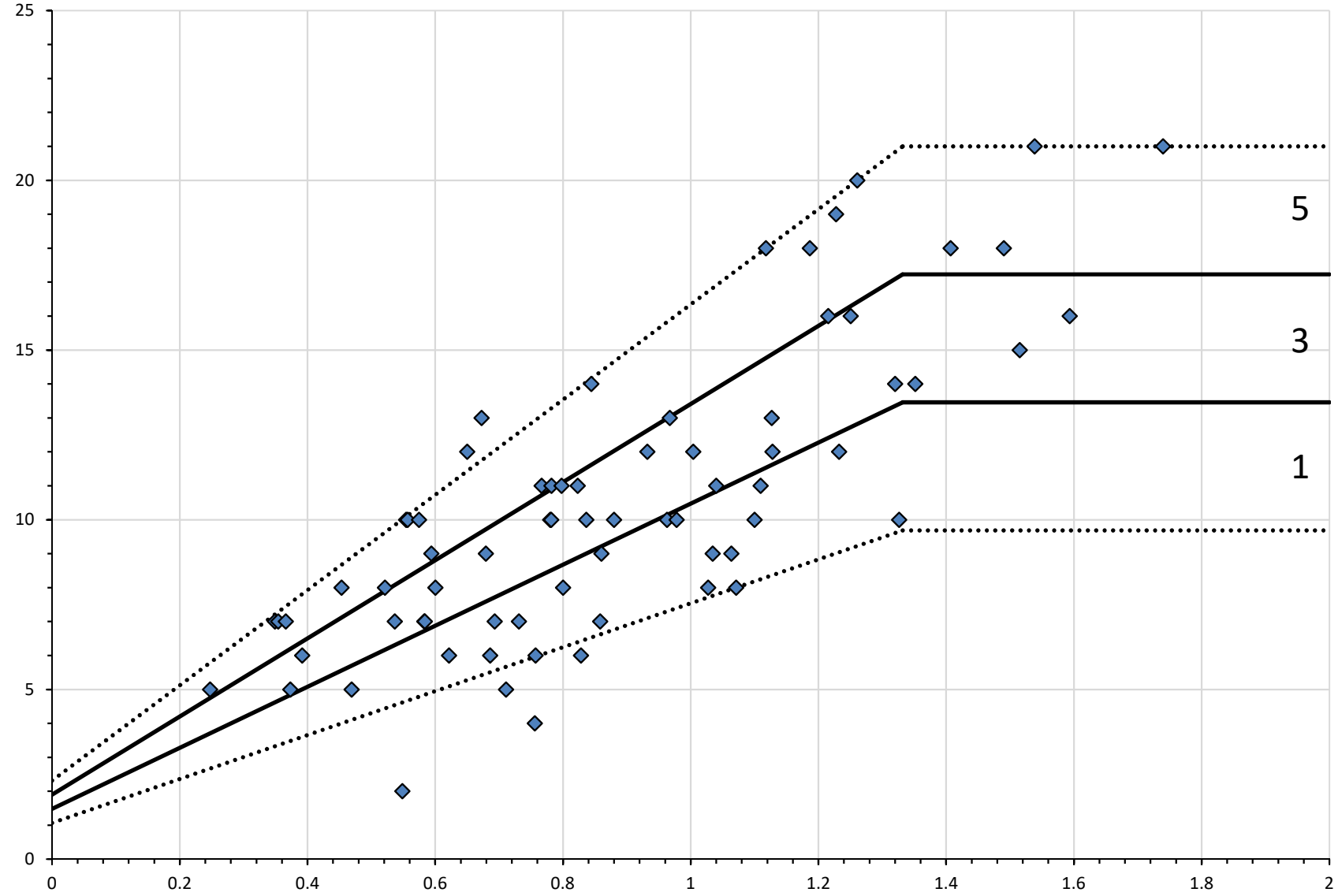
ACT5 - BRM. Number of native round-bodied sucker species in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



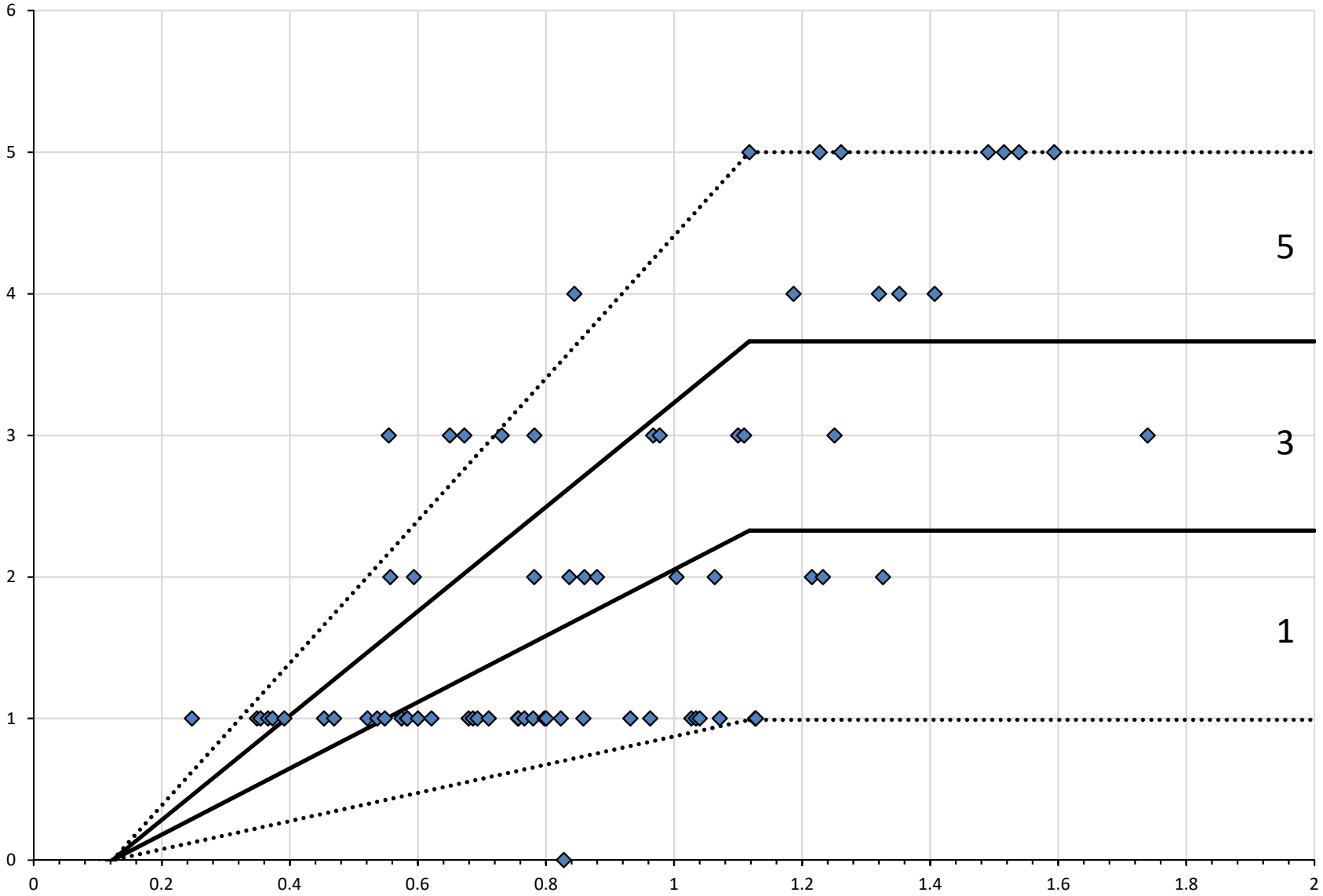
ACT6a - BRM. Total number of species ranked as sensitive at headwater sites (<15 square miles drainage basin area) in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



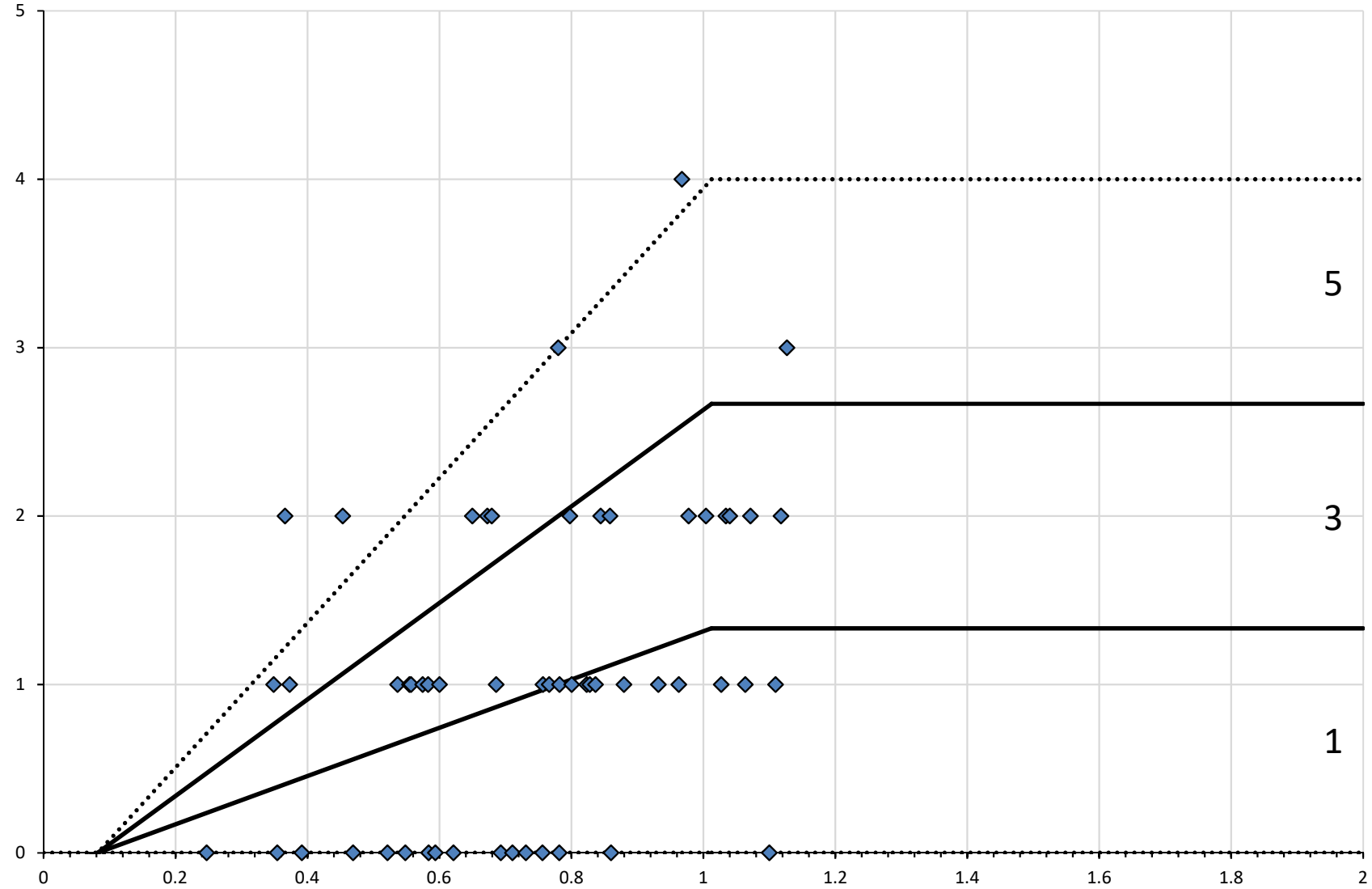
ACT6b - BRM. Number of species ranked as intolerant in the Blue Ridge ecoregion of the Coosa drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



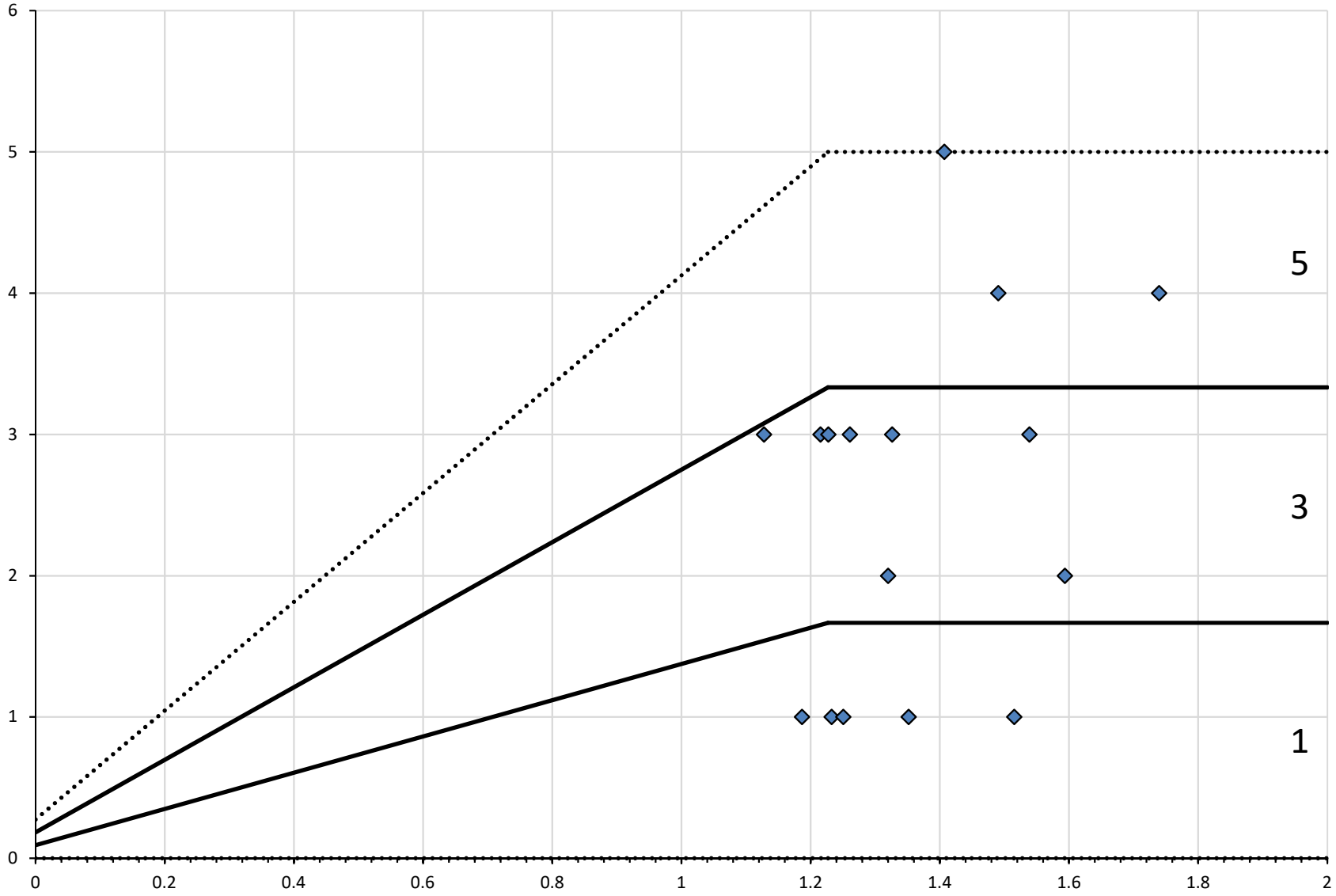
TEN1 - BRM. Total number of native species in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



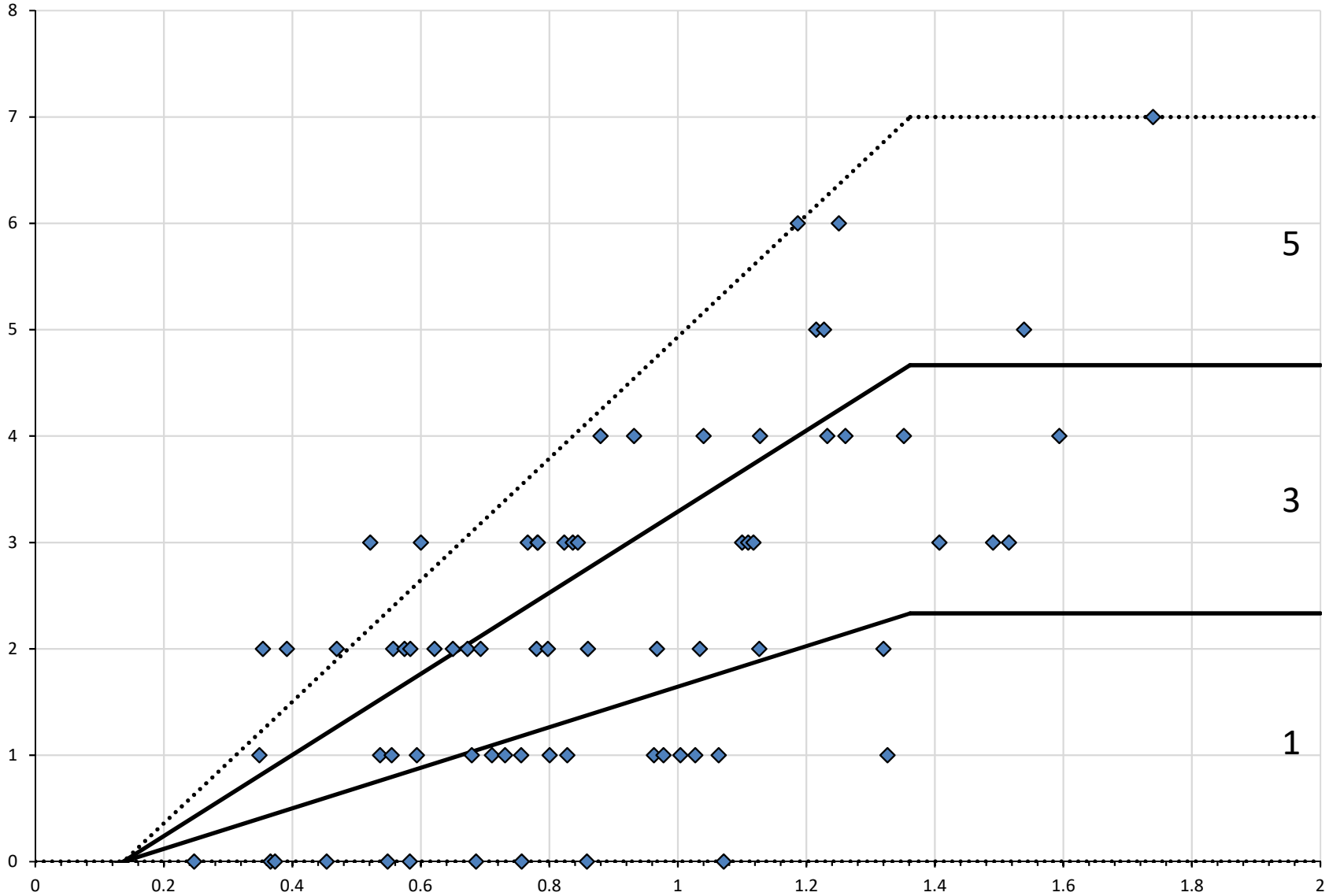
TEN2 - BRM. Number of benthic invertivore species in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



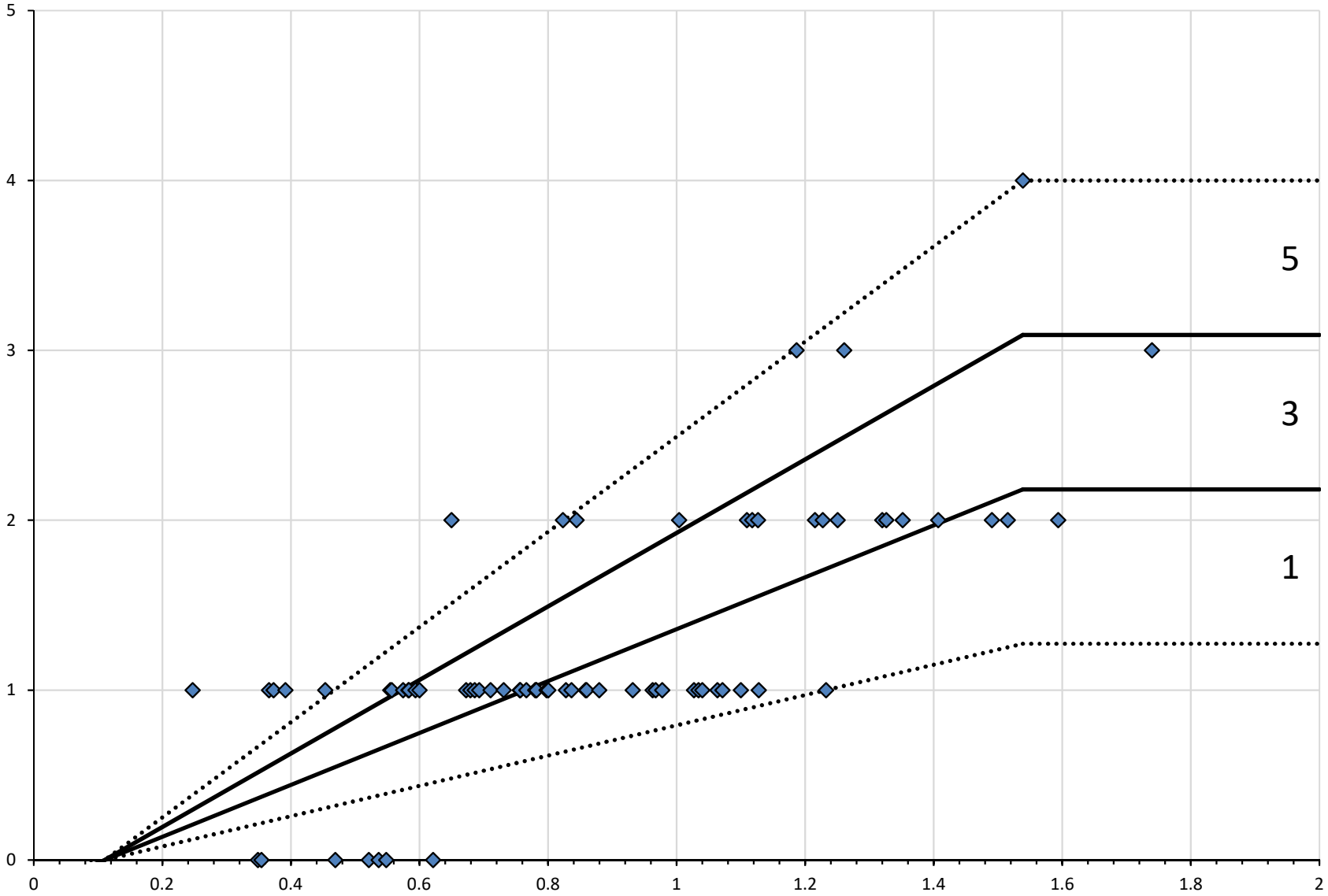
TEN3a - BRM. Number of native sunfish species in headwater streams (<15 square miles drainage basin area) in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



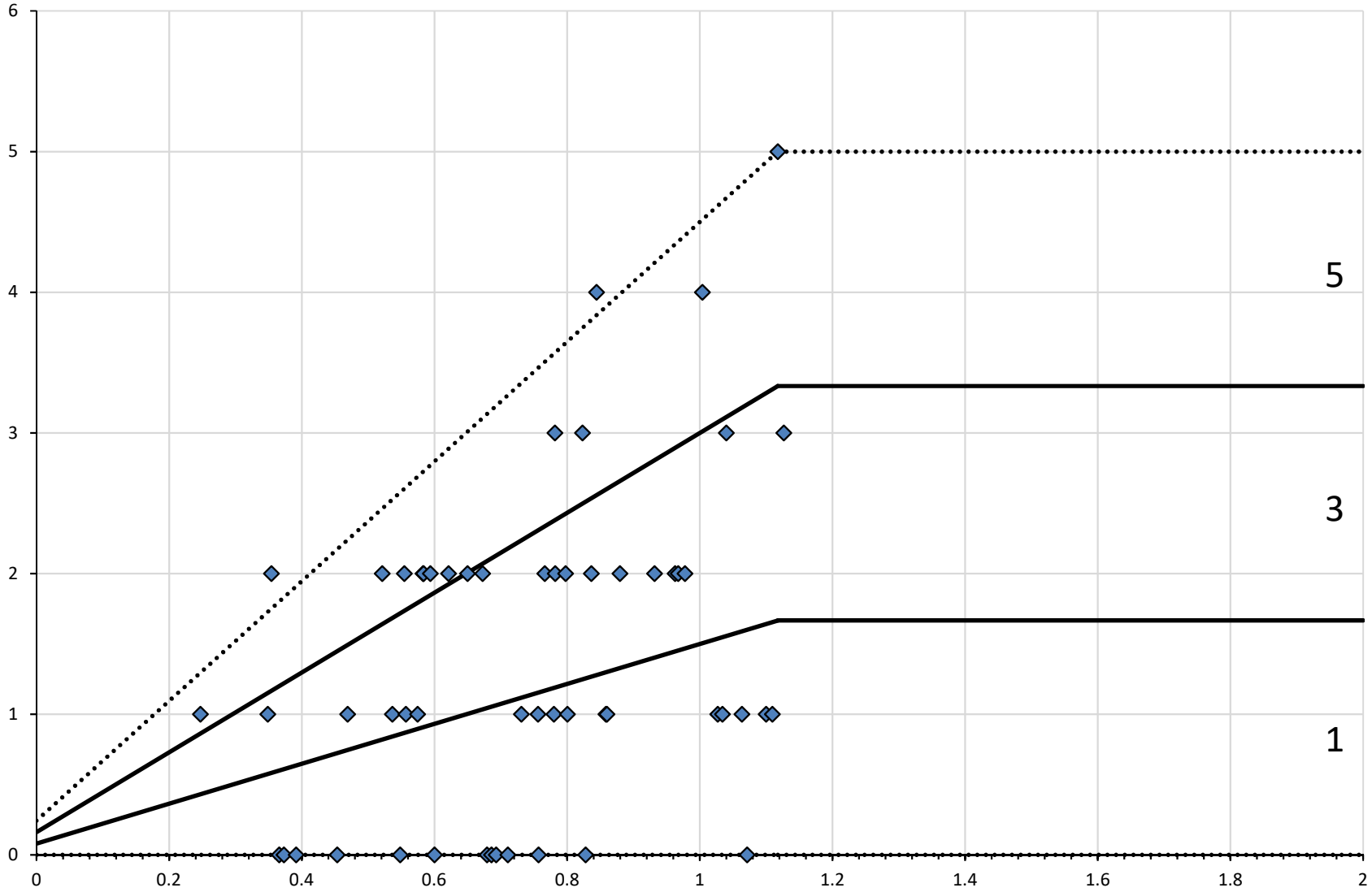
TEN3b - BRM. Number of native centrarchid species in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



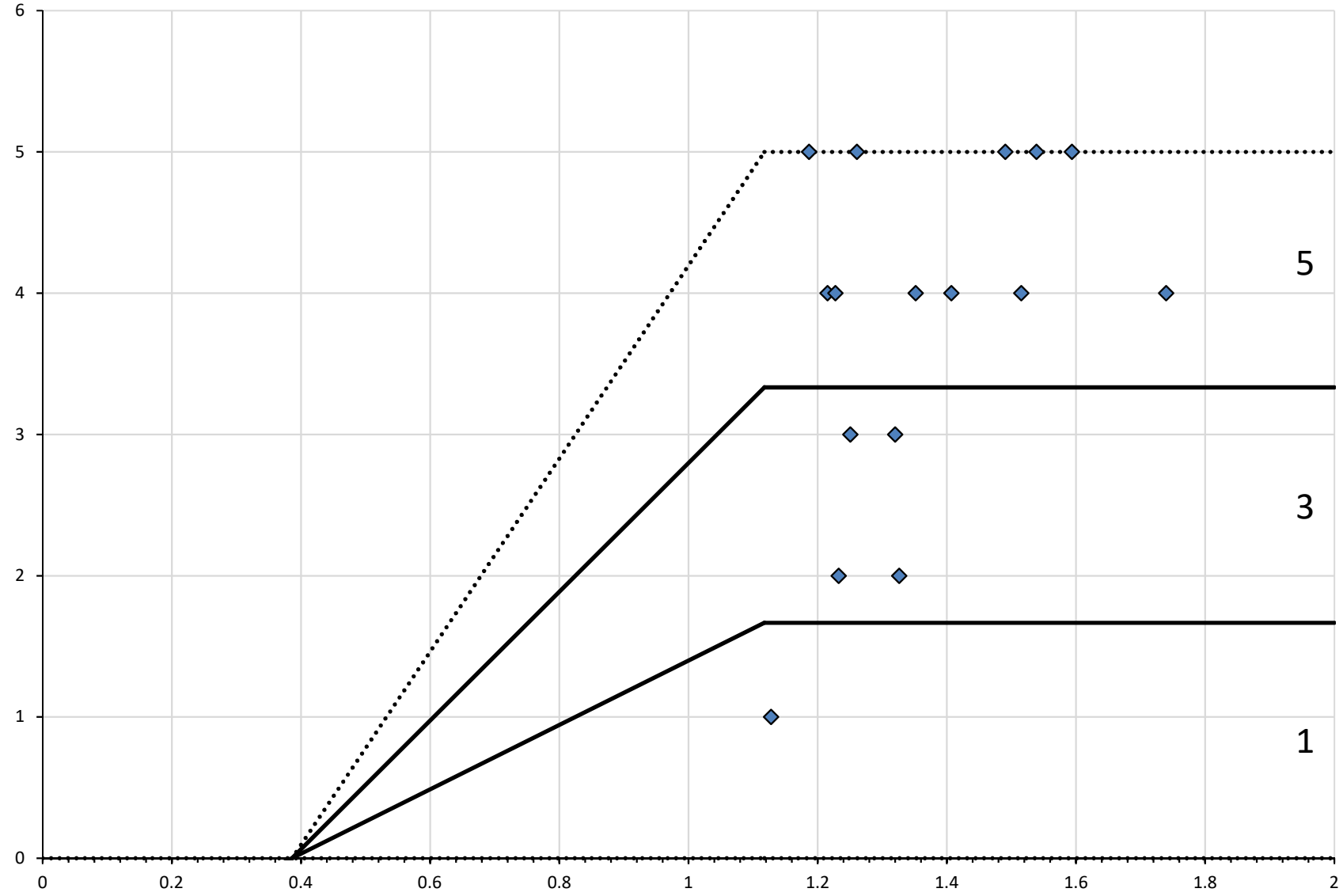
TEN4 - BRM. Number of native insectivorous cyprinid species in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



TEN5 - BRM. Number of native round-bodied sucker species in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).



TEN6a - BRM. Total number of species ranked as sensitive at headwater sites (<15 square miles drainage basin area) in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed valued of the drainage basin area (squaremiles).



TEN6b - BRM. Number of species ranked as intolerant in the Blue Ridge ecoregion of the Tennessee drainage basin plotted against the log (base 10) transformed value of the drainage basin area (square miles).

Fishes of the Coosa and Tennessee River Basins within the Blue Ridge Ecoregion of Georgia. (Updated December 2019)

Species	Tolerance Ranking	Feeding Guild	Species Category	Drainage Basin	Federal Status	State Status
Petromyzontidae						
Chestnut Lamprey* *Ichthyomyzon castaneus*		PR		COO, TEN		
Southern Brook Lamprey* *Ichthyomyzon gagei*		HB		COO		
Mountain Brook Lamprey* *Ichthyomyzon greeleyi*	INT	HB		TEN		
Least Brook Lamprey *Lampetra aepyptera*	INT	HB		COO		
Lepisosteidae						
Longnose Gar *Lepisosteus osseus*		CR		COO, TEN		
Clupeidae						
Gizzard Shad *Dorosoma cepedianum**		OM		COO, TEN		
Threadfin Shad *Dorosoma petenense*		OM		COO, TEN		
Cyprinidae						
Central Stoneroller* *Campostoma anomalum*		HB		TEN		
Largescale Stoneroller* *Campostoma oligolepis*		HB		COO, TEN		
Rosyside Dace* *Clinostomus funduloides*		IC		TEN		
Blue Shiner* *Cyprinella caerulea*	INT	IC	SMM	COO	T	E
Alabama Shiner* *Cyprinella callistia*		IC	SMM	COO		
Whitetail Shiner* *Cyprinella galactura*		IC	SMM	TEN		
Tricolor Shiner* *Cyprinella trichroistia*		IC		COO		
Blacktail shiner* *Cyprinella venusta*		IC		COO		

Species	Tolerance Ranking	Feeding Guild	Species Category	Drainage Basin	Federal Status	State Status
Common Carp* *Cyprinus carpio*		GE		EXOTIC		
Blotched Chub* *Erimystax insignis*		OM	SMM	TEN		E
Bigeye Chub* *Hybopsis amblops*		IC	SMM	TEN		
Lined Chub* *Hybopsis lineapunctata*	INT	IC	SMM	COO		R
Striped Shiner* *Luxilus chrysocephalus*		IC		COO, TEN		
Warpaint Shiner* *Luxilus coccogenis*		IC		TEN		
Bandfin Shiner* *Luxilus zonistius*		IC		COO**		
Mountain Shiner* *Lythrurus lirus*	INT	IC		COO		
Coosa Chub *Macrhybopsis etnieri*	INT	IC	SMM	COO		E
Bluehead Chub* *Nocomis leptocephalus*		OM		COO		
River Chub* *Nocomis micropogon*		OM		COO**, TEN		
Golden Shiner* *Notemigonus crysoleucas*		GE		COO, TEN		
Burrhead Shiner* *Notropis asperifrons*	INT	IC		COO		T
Rainbow Shiner* *Notropis chrosomus*	HWI	IC		COO		
Tennessee Shiner* *Notropis leuciodus*		IC		TEN		
Longnose Shiner *Notropis longirostris*		IC	SMM	COO		
Yellowfin Shiner* *Notropis lutipinnis*		IC		COO, TEN**		
Silver Shiner *Notropis photogenis*		IC		TEN		E

Species	Tolerance Ranking	Feeding Guild	Species Category	Drainage Basin	Federal Status	State Status
Mirror Shiner* *Notropis spectrunculus*		IC	SMM	TEN		
Silverstripe Shiner* *Notropis stilbius*		IC		COO		
Telescope Shiner* *Notropis telescopus*		IC		TEN		
Coosa Shiner* *Notropis xaenocephalus*		IC		COO		
Riffle Minnow* *Phenacobius catostomus*	INT	IC	SMM	COO		
Fatlips Minnow* *Phenacobius crassilabrum*	INT	IC	SMM	TEN		E
Bullhead Minnow *Pimephales vigilax*		OM		COO		
Blacknose Dace* *Rhinichthys atratulus*		IC	SMM	COO, TEN		
Longnose Dace* *Rhinichthys cataractae*	HWI	IC	SMM	TEN		
Creek Chub* *Semotilus atromaculatus*		GE		COO, TEN		
Catostomidae						
White Sucker* *Catostomus commersoni*		IN	RBS	TEN		
Alabama Hogsucker* *Hypentelium etowanum*		IN	RBS	COO		
Northern Hogsucker* *Hypentelium nigricans*		IN	RBS	TEN		
Spotted Sucker* *Minytrema melanops*		IN	RBS	COO, TEN		
Silver Redhorse *Moxostoma anisurum*		IN	RBS	TEN		
River Redhorse* *Moxostoma carinatum*	INT	IN	RBS	COO, TEN		R
Black Redhorse* *Moxostoma duquesnei*	INT	IN	RBS	COO, TEN		
Golden Redhorse* *Moxostoma erythrurum*		IN	RBS	COO, TEN		

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Blacktail Redhorse* *Moxostoma poecilurum*		IN	RBS	COO		
Sicklefin Redhorse *Moxostoma* sp. sicklefin redhorse	INT	IN	RBS	TEN	C	E
Ictaluridae						
Snail Bullhead* *Ameiurus brunneus*		GE		COO, TEN**		
Black Bullhead* *Ameiurus melas*		GE		COO, TEN		
Yellow Bullhead* *Ameiurus natalis*		GE		COO, TEN		
Brown Bullhead* *Ameiurus nebulosus*		GE		COO, TEN		
Channel Catfish* *Ictalurus punctatus*		GE		COO, TEN		
Speckled Madtom* *Noturus leptacanthus*		IN	BI	COO		
Frecklebelly Madtom *Noturus munitus*		IN	BI	COO		E
Flathead Catfish* *Pylodictis olivaris*		CR		COO, TEN		
Salmonidae						
Rainbow Trout* *Oncorhynchus mykiss*		CR		EXOTIC		
Brown Trout* *Salmo trutta*		CR		EXOTIC		
Brook Trout* *Salvelinus fontinalis*	INT	CR		COO**, TEN		
Fundulidae						
Southern Studfish* *Fundulus stellifer*		IN		COO		
Poeciliidae						
Mosquitofish* *Gambusia* sp.		GE		COO, TEN		
Cottidae						
Smoky Sculpin* *Cottus spp.*		GE	BI	COO, TEN		

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Banded Sculpin* *Cottus carolinae*		GE	BI	COO, TEN		
Percichthyidae						
White Bass *Morone chrysops*		CR		COO**, TEN		
Striped Bass *Morone saxatilis*		CR		COO		
Centrarchidae						
Shadow Bass* *Ambloplites ariommus*	INT	CR	SF	COO		
Rock Bass* *Ambloplites rupestris*	INT	CR	SF	TEN		
Redbreast Sunfish* *Lepomis auritus*		IN	SF	COO**, TEN**		
Green Sunfish* *Lepomis cyanellus*		GE	SF	COO, TEN		
Warmouth* *Lepomis gulosus*		CR	SF	COO, TEN		
Bluegill* *Lepomis macrochirus*		IN	SF	COO, TEN		
Longear Sunfish* *Lepomis megalotis*		IN	SF	COO, TEN		
Redear Sunfish* *Lepomis microlophus*		IN	SF	COO, TEN		
Spotted Sunfish* *Lepomis punctatus* x *miniatus*		IN	SF	COO		
Redeye Bass* *Micropterus coosae*		CR	CENT	COO, TEN**		
Smallmouth Bass* *Micropterus dolomieu*	INT	CR	CENT	TEN		
Alabama Bass* *Micropterus henshalli*		CR	CENT	COO, TEN**		
Spotted Bass* *Micropterus punctulatus*		CR	CENT	TEN		
Largemouth bass* *Micropterus salmoides*		CR	CENT	COO, TEN		

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White crappie *Pomoxis annularis*		CR	CENT	COO, TEN		
Black crappie* *Pomoxis nigromaculatus*		CR	CENT	COO, TEN		
Percidae						
Greenside darter* *Etheostoma blennioides*		IN	BI	TEN		
Holiday darter* *Etheostoma brevirostrum*	INT	IN	BI	COO		E
Greenfin darter* *Etheostoma chlorobranchium*		IN	BI	TEN		T
Coosa darter* *Etheostoma coosae*		IN	BI	COO		
Etowah darter* *Etheostoma etowahae*	INT	IN	BI	COO	E	E
Tuckasegee Darter* *Etheostoma gutselli*	INT	IN	BI	TEN		
Greenbreast darter* *Etheostoma jordani*	INT	IN	BI	COO		
Redline darter* *Etheostoma rufilineatum*		IN	BI	TEN		
Rock darter *Etheostoma rupestre*		IN	BI	COO		R
Cherokee darter* *Etheostoma scotti*		IN	BI	COO	T	T
Speckled darter* *Etheostoma stigmaeum*		IN	BI	COO		
Trispot darter* *Etheostoma trisella*	INT	IN	BI	COO		E
Wounded darter *Etheostoma vulneratum*	INT	IN	BI	TEN		E
Banded darter* *Etheostoma zonale*		IN	BI	TEN		
Yellow perch* *Perca flavescens*		CR		EXOTIC		
Amber Darter *Percina antesella*		IN	BI	COO	E	E

Species	Tolerance Ranking	Feeding Guild	Species Category	Drainage Basin	Federal Status	State Status
Tangerine darter *Percina aurantiaca*		IN	BI	TEN		E
Goldline darter* *Percina aurolineata*	INT	IN	BI	COO	T	E
Gilt darter* *Percina evides*	INT	IN	BI	TEN		
Conasauga Logperch *Percina jenkinsi*		IN	BI	COO	E	E
Mobile logperch* *Percina kathae*		IN	BI	COO		
Freckled Darter *Percina lenticula*		IN	BI	COO		E
Blackbanded darter* *Percina nigrofasciata*		IN	BI	COO		
Bronze darter* *Percina palmaris*		IN	BI	COO		
Dusky darter *Percina sciera*		IN	BI	TEN		R
Olive darter *Percina squamata*	INT	IN	BI	TEN		R
Bridled darter* *Percina kusha*	INT	IN	BI	COO		E

*Collected by GAWRD Stream Survey Team
Pollution Tolerance: **HWI** = headwater intolerant; **INT** = intolerant
Feeding Guild: **CR** = carnivore; **GE** = generalist; **HB** = herbivore;; **IC** = insectivorous cyprinid**; IN** = insectivore/invertivore; **OM** = omnivore; **PR** = parasitic
Species Category: **BI** = benthic invertivore; **CENT** = centrarchid species; **RBS** = round-bodied sucker species; **SF** = sunfish species; **SMM** = subterminal mouth minnow species;
Drainage Basin: **COO** = Coosa; **TEN** = Tennessee; **EXOTIC** = introduced to Georgia;
****** introduced to basin
Status: **E** = endangered; **T** = threatened; **R** = rare; **C** = of concern