Sport Fishing Index (SFI)
A Method to Quantify Sport Fishing Quality

By

Gary D. Hickman
Tennessee Valley Authority
Aquatic Biology Laboratory
Norris, TN 37828
(865) 632-1791
Fax (865) 632-1693
gdhickman@tva.gov

Key Words: Sport Fishing Quality Index
Fishing Success
Proportional Stock Density
Relative Weight

Author Biosketch

Gary D. Hickman

B.S. University of Arkansas

M.S. University of Arkansas

Certified Fisheries Scientist by American Fisheries Society

Present Employer: Tennessee Valley Authority
Aquatic Biology Laboratory
Norris, TN 37828
(865) 632-1791
Fax (865) 632-1693
gdhickman@tva.gov

Title: Principal Environmental Scientist

Abstract

A team of biologists, including representatives from TVA and state fishery resource agencies in the Tennessee River Valley, developed an index to quantify sport fishing quality for individual sport fish species. The objective of the Sport Fishing Index (SFI) is to provide the fishing public with information that will assist them in selecting locations that have the best potential for a successful fishing experience for the species they prefer. Additionally, the index provides biologists with a reference point measure of the quality of that fishery. Comparison of population sampling parameters and creel results for a particular sport fish species with expectations of these parameters from a high quality fishery (reference conditions) allows determination of fishing quality. To date, indices developed include largemouth, smallmouth, and spotted bass; crappies (black and white combined); walleye; sauger; and channel catfish. Each SFI relies on measurements of quantity and quality aspects of angler success and fish population characteristics. Comparison of index results among reservoirs and between years from Tennessee and Cumberland River reservoirs from 1996 through 1998 indicated that differences in fishing quality for a particular species were measurable.

Introduction

One of the most common questions asked by the fishing public: "In the general area where I live, where do I have the best opportunity of experiencing a quality fishing trip for the species I most like to catch?" The question is not easy to answer because the definition of quality differs with individual anglers. Fishery managers have spent numerous hours and dollars trying to provide this information.

Generally, fishery managers survey existing sport fish communities at least on an annual basis, using a variety of sampling techniques, depending on the species, size group of interest, and time of year. They also monitor fishing success and pressure via creel surveys. The problem then becomes how to pool the information and get the results to the fishing public in a readily understood manner.

Colvin and Vasey (1986) developed a method of qualitatively assessing crappie populations in Missouri reservoirs based on fall trap nets samples. Aspects measured included population density, growth rate, age structure, size structure, and recruitment. They did not include any measurement of angler success or fishing pressure expended for crappie. However, they were able to rate reservoir crappie populations based on a system of assigning point values (1-10) for each parameter, with an overall rating obtained by summing attained values.

The Tennessee Valley Authority (TVA) initiated a reservoir monitoring program in 1990 to evaluate the health of the reservoir ecosystem, and to examine how well each reservoir met the swimmable and fishable goals of the Clean Water Act (Dycus and Meinert, 1993). Measurements of five indicators of reservoir health included: dissolved oxygen, chlorophyll, sediment quality, benthic macroinvertebrate community quality, and fish community quality. This information was distributed to the public through an annual publication entitled "RiverPulse". However, numerous responses from the public indicated that they also desired a measure of sport fishing quality. As a result, TVA assembled a multi-agency team of fishery

biologists (representatives from each state fishery management organization, universities, and TVA) to develop a method of assessing sport fishing quality in TVA reservoirs.

The objective of the Sport Fishing Index (SFI) team was to develop a multi-metric index capable of measuring sport fishing quality for individual species in specific Tennessee Valley reservoirs. The team evaluated several parameters that were calculated from creel surveys and population samples. The best and easily attainable ones were selected for inclusion as metrics for the index. The goal of the team was to develop an SFI that would provide anglers with information that help them select the best reservoirs for the species they prefer to catch.

Methods

State fishery management agencies (Alabama Department of Conservation; Georgia Department of Natural Resources; Kentucky Department of Fish and Wildlife Resources; Mississippi Department of Wildlife, Fish, and Parks; and the Tennessee Wildlife Resources Agency) and TVA provided valuable data used in the calculation of the SFI. Data from creel surveys and standard population samples (electrofishing, trap netting, and experimental gill netting) were used. Results of each of these data sets were further separated into quantity and quality components (Figure 1). The SFI is calculated by comparing values for selected quantity and quality parameters from creel and population samples, to expected values that would occur in a good or high quality fishery. Point values are assigned to the parameters (up to 15 maximum per parameter) with higher points for higher quality fisheries. An overall SFI is

obtained by summing the point values (60 possible) that were assigned to each of the quantity and quality parameters.

Quantity--Capture rates of each species from creel surveys and population samples were assumed to be indicators of fish abundance, and therefore were used as quantity measures. Angler catch rates were calculated from anglers who indicated that they were directing their efforts for the species in question. The population sampling methods and size groups used to calculate capture rates are given in Table 1. In the SFI, higher capture rates indicated a better quality fishery.

When developing an SFI for black bass (largemouth, smallmouth, and spotted combined), capture rates for anglers fishing bass tournaments (catch per day per tournament angler) were used to supplement black bass angler catch rates (catch per hour) observed during general creel surveys. These data were obtained through state bass tournament information programs (BITE in Tennessee and BAIT in Alabama) which annually collect tournament catch information from local, regional and national bass tournaments held in the respective state. Although bass tournament results did not account for fish that were caught and released, tournament data did provide information useful in determining the general quality of the black bass fishery, especially when standard creel results were unavailable. When both data sets are available, each set was weighted equally. Otherwise, only the available data set was used.

Tournament results could not be used to calculate individual bass species SFI values as tournament data was generally not broken down to the species level. In the general creel, distinctions were not made between species targeted, therefore fishing pressure reported for each bass species was the same.

Also for black bass species, either state agency or TVA electrofishing results were used for population parameters. Electrofishing capture rates were generally higher for state agency samples due to the different purposes of the sampling efforts between the two groups. TVA samples targeted the entire fish community, whereas state biologists actively sought only black basses in their samples. Consequently, a different set of catch rate scoring criteria were needed for each type of electrofishing sampling (Table 2). State electrofishing results were used if available, otherwise TVA results were used.

Quality--Quality measurements were determined by assessing the amount of effort anglers exerted towards a species and by the quality of the population as determined from looking at five different aspects of the population samples. Consequently, more parameters were included in the quality components of the index than the quantity components. Fishing pressure directed towards the target species as measured from creel surveys was used as a measure of fishing quality. This is based on the assumption that as fishing success improves for a particular species, the amount of effort expended for that species will also increase. However, we recognized that, by itself, fishing pressure could not always be compared among lakes and used as a measure of fishing quality, because higher pressure also was apparent on lakes that were

near population centers. When combined with high angler catch rates for a specific species, angling pressure for that species can be representative of fishing quality. Additionally, population characteristics as measured from standard population samples supplemented the determination of fishery quality (Figure 1).

Population quality is based on measurement of five aspects of each resident sport fish community, with each aspect making up 20 percent of the overall population quality rating (Table 3). These aspects include four which address size structure (proportional number of fish in each length group) of the community as described by Anderson (1980) and Gablehouse (1984): Proportional Stock Density (PSD), Relative Stock Density of Preferred-sized fish (RSDP), Relative Stock Density of Memorable-sized fish (RSDM), and Relative Stock Density of Trophy-sized fish (RSDT). Composition of resident fish populations with an adequate size structure is reflective of the quality of that particular fishery. Relative weight (W_r), a measure of average condition of individual fish (Anderson, 1980), makes up the fifth population quality aspect. The size-group used for W_r determination for each species includes "stock" through "preferred" as described by Gablehouse (1984). This group generally supports the majority of a particular fishery. In the case of largemouth bass, 200 to 380 mm (10 to 15 inches) fish are used, for crappie, fish between 130 and 250 mm (5 to 10 inches) in total length are used. Fall length-weight measurements were used when available for W_r calculations to minimize variation often present during other seasonal periods.

Calculations--Comparison of actual results to expectations for a high quality fishery allows determination of fishing quality for a particular sport fish species in each reservoir. Expectations (reference conditions) for parameters were derived by two different methods. Expectations or reference conditions for angler catch rates, fishing pressure, and population sample catch rates were derived by trisecting the range of values obtained during state fish and wildlife agency or TVA fish sampling results (zero to 95 percent of the range of observed scores) from 1990 to 1995 for Tennessee and Cumberland River mainstream and tributary reservoirs (Table 2). Use of this technique requires inclusion of a full range from high to low quality fisheries for each sport fish species in Tennessee and Cumberland River reservoirs during these years. Criteria for population quality aspects (PSD, RSDP, RSDM, RSDT, and W_r) were based on recognized standards for development of a multi-species fishery as described by Gablehouse (1984) (Table 3).

Observed values were compared to reference ranges and assigned a corresponding numerical value. Each of the four components (angler success quantity and quality, and population quantity and quality) were given a maximum attainable value of 15 (Tables 2 and 3). A score of 5 represented less than desirable or poor conditions, 10 for marginal, and 15 for good or excellent conditions. In order to equally weigh the five parameters making up the population quality component, scores are adjusted to allow for a maximum parameter score of 15, i.e., each aspect assigned a maximum score of 3 (Table 3). It should be noted here that individual population quality parameters are scored separately, i.e., a population can receive a high score for PSD (3) while at the same time receiving a low score for RSDP (1) and a moderate score

for RSDM (2). The resident population structure, through comparison with appropriate reference ranges, determines each assigned score. When individual parameters were missing, available parameters were adjusted to equal the total points possible for that component. For example, if bass tournament information was available but bass creel catch rate was not, the tournament data was adjusted to a maximum of 15 points instead of 7.5. The four component values were summed for individual species to obtain the Sport Fish Index (SFI) value for that species.

Using this approach, the maximum SFI score is 60 and the minimum is 20. When only creel or population data are available, the SFI value is calculated by summing the scores for quantity and quality from the existing data and multiplying by two.

When population density of a particular sport fish species in a reservoir was so low that not enough individuals were captured to reliably determine proportional densities or relative weights, then that species received a low score for that parameter. A technique described by Weithman et al. (1980) was used to determine if sample size was large enough to accurately (90 percent confidence) categorize PSD and RSD estimates into standard groups (i.e. PSD=0-39, 40-60, 61-100). This was accomplished by comparison of the number of quality length fish within a sample of stock length individuals. Populations with relatively low or high PSD values required fewer individuals sampled to obtain a reliable estimate than those with moderate values. Weithman et al. (1980) noted that a maximum of 100 fish will always provide a reliable estimate

of PSD. A minimum of 10 individuals within the appropriate size ranges were required to obtain a representative W_r sample.

Results

Sport fishing index results for Tennessee and Cumberland River reservoirs during 1996 through 1998 are shown in Tables 4 and 5. The average SFI rating for each species for all Tennessee and Cumberland reservoirs with data available for calculations is included for comparative purposes. Results usually followed expectations. Reservoirs that were generally considered to be high quality by both anglers and biologists for a particular species scored high; and those that were considered poor for a particular sport fish species usually scored low.

Using black bass as an example, Figure 2 displays the capability of the SFI to distinguish the wide range of fishery quality available in reservoirs in both Tennessee and Cumberland River systems. Results were similar for other sport fish species. Sample variation between years at individual reservoirs was relatively low over the three-year sample period. A majority of SFI scores (>75%) varied 10 points or less. Larger variances could generally be explained by shifts in the quality of particular fisheries. For example, the black bass SFI in Cherokee Reservoir revealed an apparent steady decline in bass fishery quality over the three-year period from 1996-1998 (SFI scores of 52, 46, 31, respectively). This is born out by examination of electrofishing catch rate and proportion of the population made of preferred sized bass (RSDP) over this time period at Cherokee. Catch rates for bass declined while the proportion of the

population made up of larger individuals increased, indicating poor recruitment to the fishery (Figure 3).

In order to make the information readily available and understandable to the angling community and regulatory agencies, graphs are used to show annual SFI results for individual species or species groups (Figure 4). Anglers use the graphs to focus their efforts on reservoirs with the highest quality fisheries for a particular species during a particular year. The SFI graphs also provide for comparisons between fishery quality among a series of reservoirs. Graphs of individual sport fish species are generated for publication in local magazines and pamphlets, and are used in permit compliance documentation where appropriate.

In recent years, SFI information has been used to describe the quality of the resident fishery in conjunction with compliance monitoring and other regulatory issues at two TVA nuclear plants. SFI was used during operational monitoring in the vicinity of Watts Bar Nuclear Plant (Baxter, 1998), in support of a thermal variance request at Sequoyah Nuclear Plant (TVA, 1996), and in the Environmental Assessment for the Watts Bar Nuclear Plant Supplemental Condenser Cooling Water Project (TVA, 1998). In each of these instances the SFI provided information showing high quality fisheries for sauger, the most likely sport fish species to be adversely impacted as a result of plant operation. This information, along with other information regarding potential for adverse impacts, was instrumental in renewing operational permits at both Watts Bar and Sequoyah nuclear plants.

Conclusions

The Sport Fishing Index was able to measure differences between reservoir fishing quality for individual species and species groups. Comparison of individual lake results with an overall average SFI for all lakes that particular year provides another indicator for both anglers and biologists. The SFI index has also been used successfully in a regulatory setting.

Anglers find the index a helpful source of information for determining those lakes that are typically productive for the species of fish they prefer to catch. When anglers experience poor success in a particular lake, they can refer to the relevant SFI to determine if the fishing quality for the species sought was typically low, or had declined over previous years.

State biologists have found that the SFI is useful in making resource management decisions. The inclusion of both population quantity and quality aspects with angler catch rates and fishing pressure on a particular reservoir can give biologists a more comprehensive appraisal of the fishery.

Agency cooperation is important to maximize quality of the results and minimize costs of data collection. Pooling of multiple state resource and federal agency information enhances the index through coverage of a larger number of reservoirs; therefore, a more thorough index with a wider range of indicator conditions can be developed.

References

Anderson, R. O. 1980. Proportional stock density (PSD) and relative weight (Wr): interpretive indices for fish populations and communities. In S. Gloss and B. Shupp (eds.) Practical fisheries management: more with less in the 1980's. New York Cooperative Fishery Research Unit, Ithaca, New York. 27-33.

Baxter, D. S. 1998. Aquatic environmental conditions in the vicinity of Watts Bar Nuclear Plant during two years of operation, 1996-1997. Tennessee Valley Authority, Water Management, Chattanooga, TN. 259 pp.

Colvin, M. A. and F. W. Vasey. 1986. A method of qualitatively assessing white crappie populations in Missouri reservoirs. In G. E. Hall and M. J. Van Den Avyle (eds.) Reservoir Fisheries Management Strategies for the 80's. American Fisheries Society, Bethesda, Maryland. 79-85.

Dycus, D. L. and D. L. Meinert. 1993. Reservoir monitoring, monitoring and evaluation of aquatic resource health and use suitability in Tennessee Valley Authority reservoirs. Tennessee Valley Authority, Water Resources, Chattanooga, Tennessee, TVA/WM – 93/15.

Gablehouse, D. W., Jr. 1984. A length-categorization system to assess fish stocks. North American Journal of Fisheries Management 4(3):273-285.

Tennessee Valley Authority. 1996. A supplemental 316(a) demonstration for alternative thermal discharge limits for Sequoyah Nuclear Plant, Chickamauga Reservoir, Tennessee. Tennessee Valley Authority, Engineering Laboratory, Norris, TN. WR96-1-45-145. 87 pp.

Tennessee Valley Authority. 1997. Watts Bar Nuclear Plant supplemental condenser cooling water project draft environmental assessment. Tennessee Valley Authority, Engineering Laboratory, Norris, TN. 53 pp.

Weithman, A. S., J. B. Reynolds, and D. E. Simpson. 1980. Assessment of structure of largemouth bass stock by sequential sampling. Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 33(1979):415-424.

Table 1. Population sampling methods and size groups used to calculate capture rates.

Species	**Sampling Method**	**Size Groups**	**Unit of Measure**
Largemouth bass	Electrofishing	≥200	Number Per Hour
Smallmouth bass	Electrofishing	≥180	Number Per Hour
Spotted bass	Electrofishing	≥150	Number Per Hour
Black & White crappie	Trap Netting	≥130	Number Per Net Night
Sauger	Exp. Gill Netting	≥200	Number Per Net Night
Walleye	Exp. Gill Netting	≥250	Number Per Net Night
Channel Catfish	Exp. Gill Netting	≥280	Number Per Net Night

Table 2. Sport Fish Index population quantity and creel quantity and quality metrics and scoring criteria.

Metrics	**Scores**		
	Black Bass		
Population - Quantity	**5**	**10**	**15**
TVA Electro. catch/hour	<15	15 - 31	>31
State Electro. catch/hour	<62	62 - 124	>124
Creel - Quantity	**2.5 each**	**5 each**	**7.5 each**
Anglers catch/hour	<0.3	0.3 - 0.6	>0.6
BAIT & BITE data	<1.1	1.1 - 2.3	>2.3
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<8	8 - 16	>16
	Largemouth Bass		
Population – Quantity[1]	**5**	**10**	**15**
TVA Electro. catch/hour	<13	13 - 25	>25
State Electro. catch/hour	<53	53 - 106	>106
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.29	0.29 - 0.58	>0.58
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<8	8 - 16	>16
	Smallmouth Bass		
Population - Quantity	**5**	**10**	**15**
TVA Electro. catch/hour	<4	4 - 8	>8
State Electro. catch/hour	<8	8 - 15	>15
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.1	0.1 - 0.3	>0.3
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<8	8 - 16	>16
	Spotted Bass		
Population - Quantity	**5**	**10**	**15**
TVA Electro. catch/hour	<5	5 - 11	>11
State Electro. catch/hour	<14	14 - 27	>27
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.07	0.07 - 0.13	>0.13
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<8	8 - 16	>16
	Crappie		
Population - Quantity	**5**	**10**	**15**
Trap Net catch/net night	<4	4 - 7	>7
Creel - Quality	**5**	**10**	**15**
Anglers catch/hour	<0.6	0.6 - 1.2	>1.2
Creel - Quantity	**5**	**10**	**15**
Pressure (hours/acre)	<6	6 - 12	>12

Table 2 (continued)

	Sauger		
Population - Quantity	**5**	**10**	**15**
Exp. Gill Net catch/net night	<9	9-17	>17
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.5	0.5 - 1	>1
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<5	5 - 10	>10
	Walleye		
Population - Quantity	**5**	**10**	**15**
Exp. Gill Net catch/net night	<5	5 - 11	>11
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.2	0.2 - 0.4	>0.4
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<5	5 - 10	>10
	Channel Catfish		
Population - Quantity	**5**	**10**	**15**
Exp. Gill Net catch/net night	<2	2 - 4	>4
Creel - Quantity	**5**	**10**	**15**
Anglers catch/hour	<0.3	0.3 - 0.7	>0.7
Creel - Quality	**5**	**10**	**15**
Pressure (hours/acre)	<9	9 - 19	>19

[1] TVA electrofishing only used when state agency electrofishing data is unavailable.

Table 3. Sport Fish Index population quality metrics and scoring criteria.

	Scores		
Metrics	**5**	**10**	**15**
Population - Quality	1	2	3
PSD	<20 or >80	20-39 or 61-80	40-60
RSDP (preferred)	0 or >60	1-9 or 41-60	10-40
RSDM (memorable)	0 or >25	1-4 or 11-25	5-10
RSDT (trophy)	0	<1	≥1
W_r (Stock-Preferred size fish)	<90	>110	90-110

Table 4. Sport fishing index values (minimum 20, maximum 60) for black basses; largemouth, smallmouth, and spotted bass (1996-1998)

	Black Bass			Largemouth Bass			Smallmouth Bass			Spotted Bass		
Reservoir	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**
Cumberland Mainstream												
Cordell Hull	38		34	28		28	40		42			
Old Hickory	40	48	34	30	47	31	30					
Cheatham		43	43		46	46						
Barkley	44	40	39	49	40	43						22
Cumberland Tributary												
Dale Hollow	33	42		23	34		38	57		31	42	
Great Falls	32	42		30	42						24	
Center Hill	39	47	40	29	40	32	40	52	30	45	59	41
Percy Priest	40	50	38	40	50	41	40	30	36	40	30	38
Tennessee Mainstream												
Fort Loudoun	43	39	37	33	41	32	30	32	30	25		
Watts Bar	48	42	39	43	44	26	35	27	39	34	27	31
Chickamauga	45	37	41	47	39	37	25	25	20	41	25	37
Nickajack	44	40	35	42	42	37	20	25	20	33	27	34
Guntersville	36	42	37	32	42	42				35	40	35
Wheeler	47	36	37	34	44	34	48	44	26	32	20	
Wilson	31		42	42		44	40		42	20		24
Pickwick	51	37	37	44	34	34	42		58	42	20	24
Kentucky	31	34	33	30	32	34	24	30	29	32	34	26
Tennessee Tributary												
Watauga	41	38	25	35	35	29	50	46	38			
South Holston	41	37	36	30	35	30	46	37	45			
Boone	39	44	39	36	36	38	46	42	50			
Fort Patrick	34		32	30		28			34			
Cherokee	52	46	31	57	50	29	36	32	20	30		22
Douglas	36	44	40	31	41	40	20					
Tellico	41	33	38	33	33	32	33	25	44	35	25	22
Norris	27	27	32	23	24	25	28	25	35	34	27	36
Melton Hill	28	34	35	28	32	30	20	20	20		20	20
Chatuge	40	32	24	38	20	20	20			40	46	34
Nottely		20	24		20	24		20	20		20	26
Blue Ridge		20			20			30				
Hiwassee	32		26	40		28	42		26	40		24
Woods	40	47		34	47			30				
Tims Ford	32		23	29		20	45		25	25		
Normandy	44	40	38	40	33	36	35	30		45	45	50
Other												
Reelfoot	30		30	30		32						
AVERAGE	**38.7**	**37.4**	**34.5**	**35.2**	**37.3**	**32.7**	**34.9**	**33**	**33.1**	**34.7**	**31.2**	**30.3**

Table 5. Sport fishing index values (minimum 20, maximum 60) for crappie (black and white combined), walleye, sauger, and channel catfish (1996-1998).

	Crappie			**Walleye**			**Sauger**			**Channel Catfish**		
Reservoir	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**	**1996**	**1997**	**1998**
Cumberland Mainstream												
Cordell Hull												
Old Hickory	20	35					30	20	27	20		30
Cheatham		20	30									
Barkley	30	36	46									
Cumberland Tributary												
Dale Hollow	25	30								30		
Great Falls												
Center Hill	25	25		50	40	32				30		26
Percy Priest	40	35	41							20		36
Tennessee Mainstream												
Fort Loudoun	30	30					35	33	33	30		
Watts Bar	30	36	44				33	32	30	25		
Chickamauga	30	30					39	27	36	30		
Nickajack	20	30					20	20		20		
Guntersville	24	40					54	42	45			
Wheeler								34				
Wilson	20						20			20		20
Pickwick							48		44	20		24
Kentucky	38	49	52				25	30	31	20	25	
Tennessee Tributary												
Watauga	20	20		45	46	34				25		30
South Holston	26	30	27	50	20	34				20	30	30
Boone		32								30	27	20
Fort Patrick										30		
Cherokee	34	36	36				35	40	27	25		37
Douglas	36	46	46	35				38	38	20		
Tellico	25	30		20	20	20					20	26
Norris	20	36	36	20	32	24	20			30	22	22
Melton Hill							20			40		
Chatuge				30	20	24				20	20	30
Nottely				30	20	28				50	40	40
Blue Ridge					20						20	
Hiwassee				20						20		20
Woods	20	40									20	
Tims Ford	20			25		32				20		20
Normandy	30	40		20		24	20	20		35	20	30
Other												
Reelfoot	60		50							20		
AVERAGE	**28.3**	**33.6**	**39.1**	**31.4**	**27.3**	**28.0**	**30.7**	**30.5**	**34.6**	**26.0**	**25.6**	**27.4**

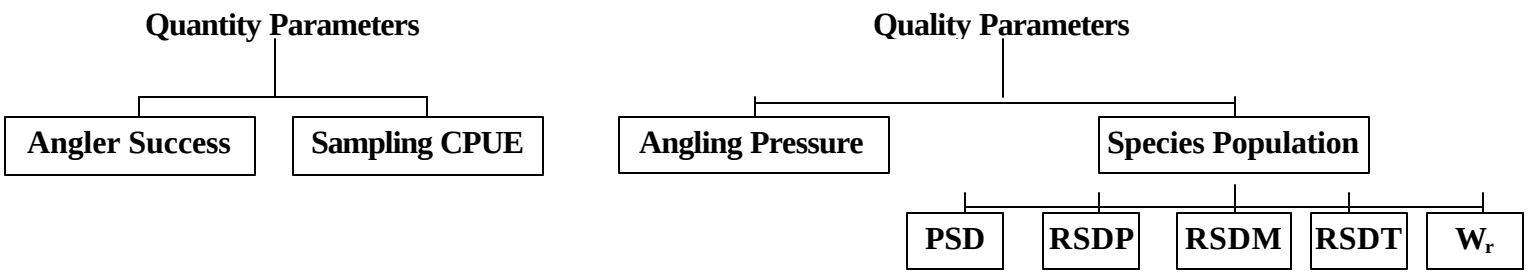

Figure 1. Parameters used to calculate the Sport Fishing Index (SFI).

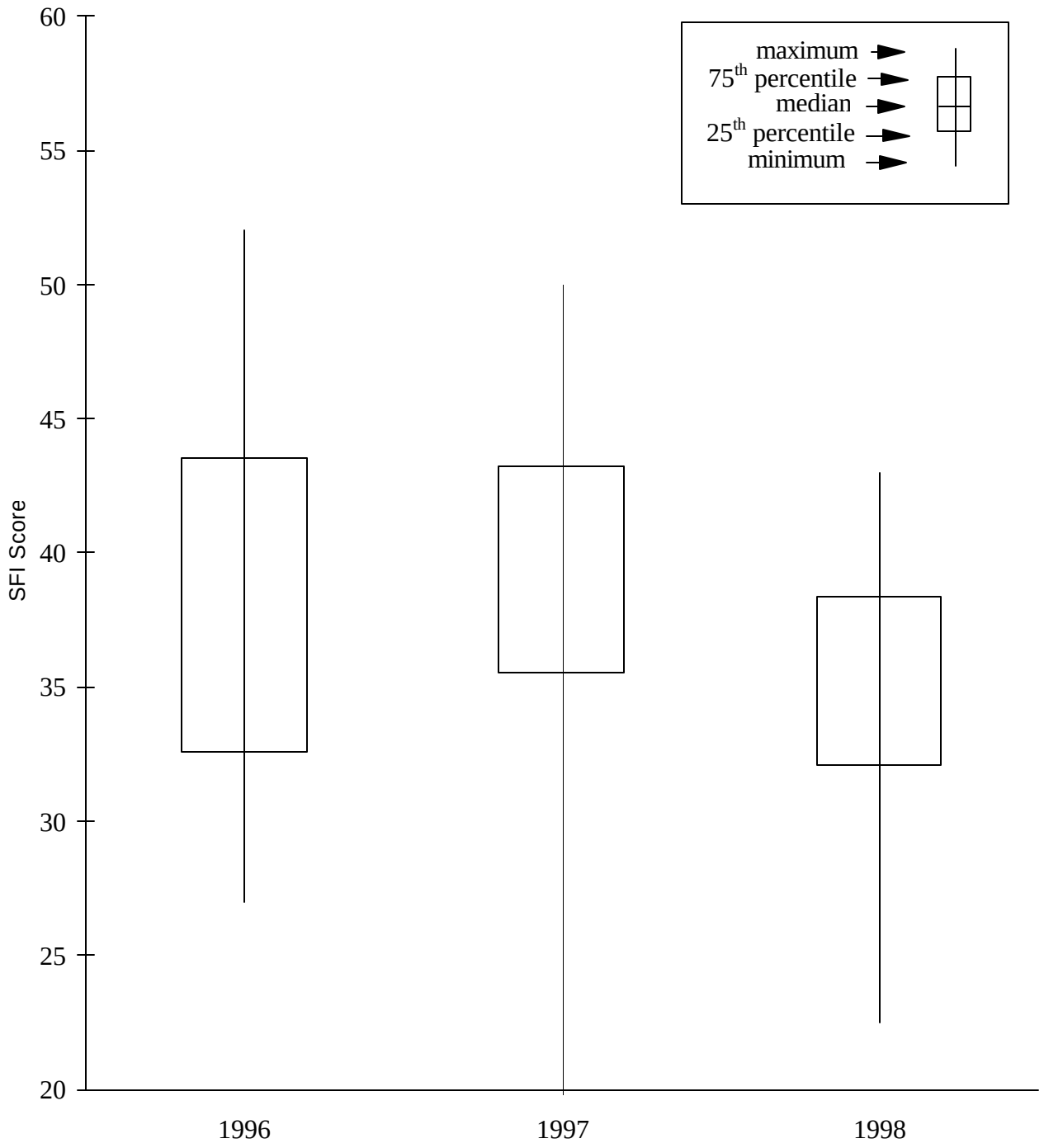

Figure 2. Comparison of SFI scores from all sites during 1996-1998.

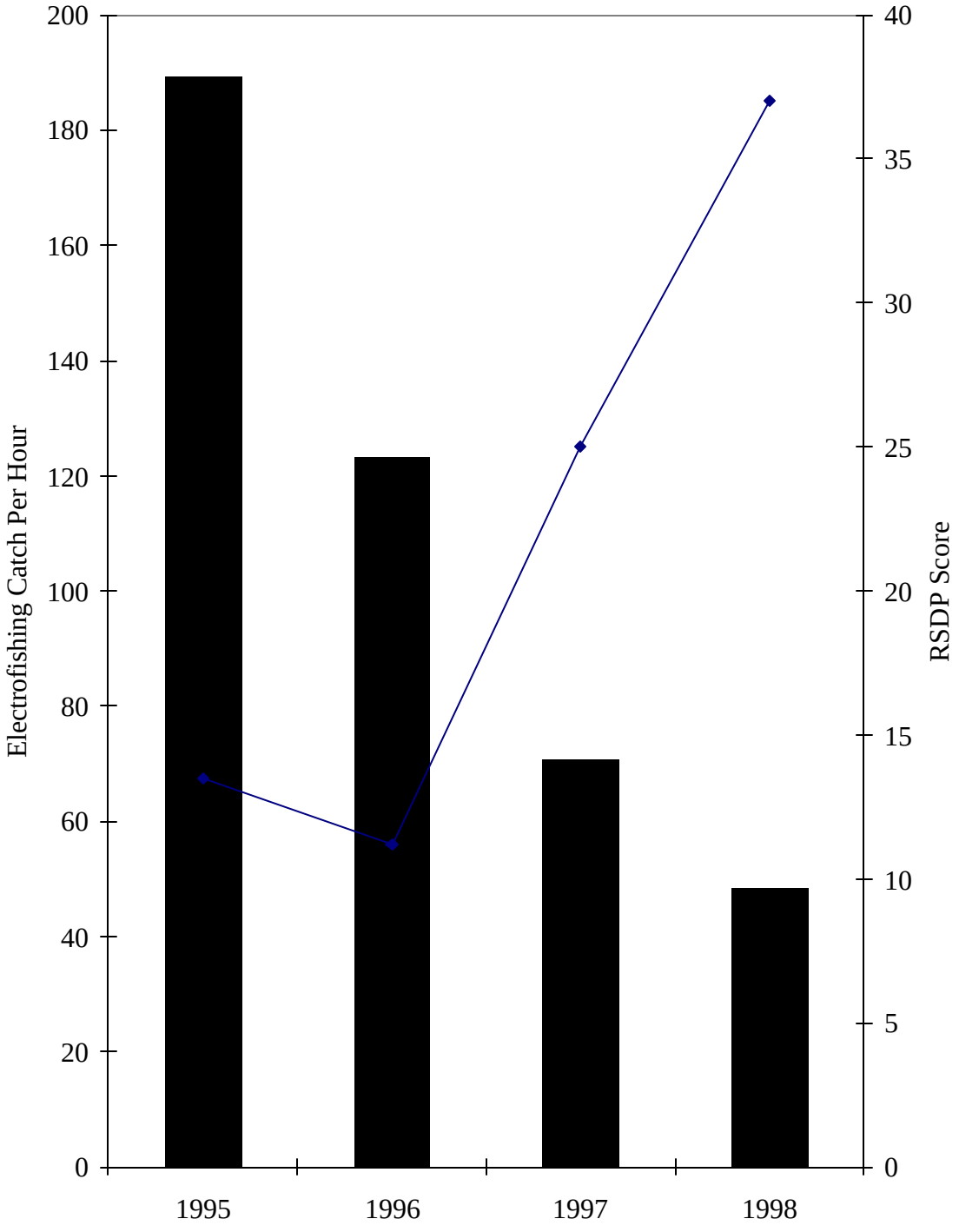

Figure 3. Electrofishing catch per hour for black bass from Cherokee Reservoir during 1995-1998 with Relative Stock Density of Preferred-sized (RSDP) bass.

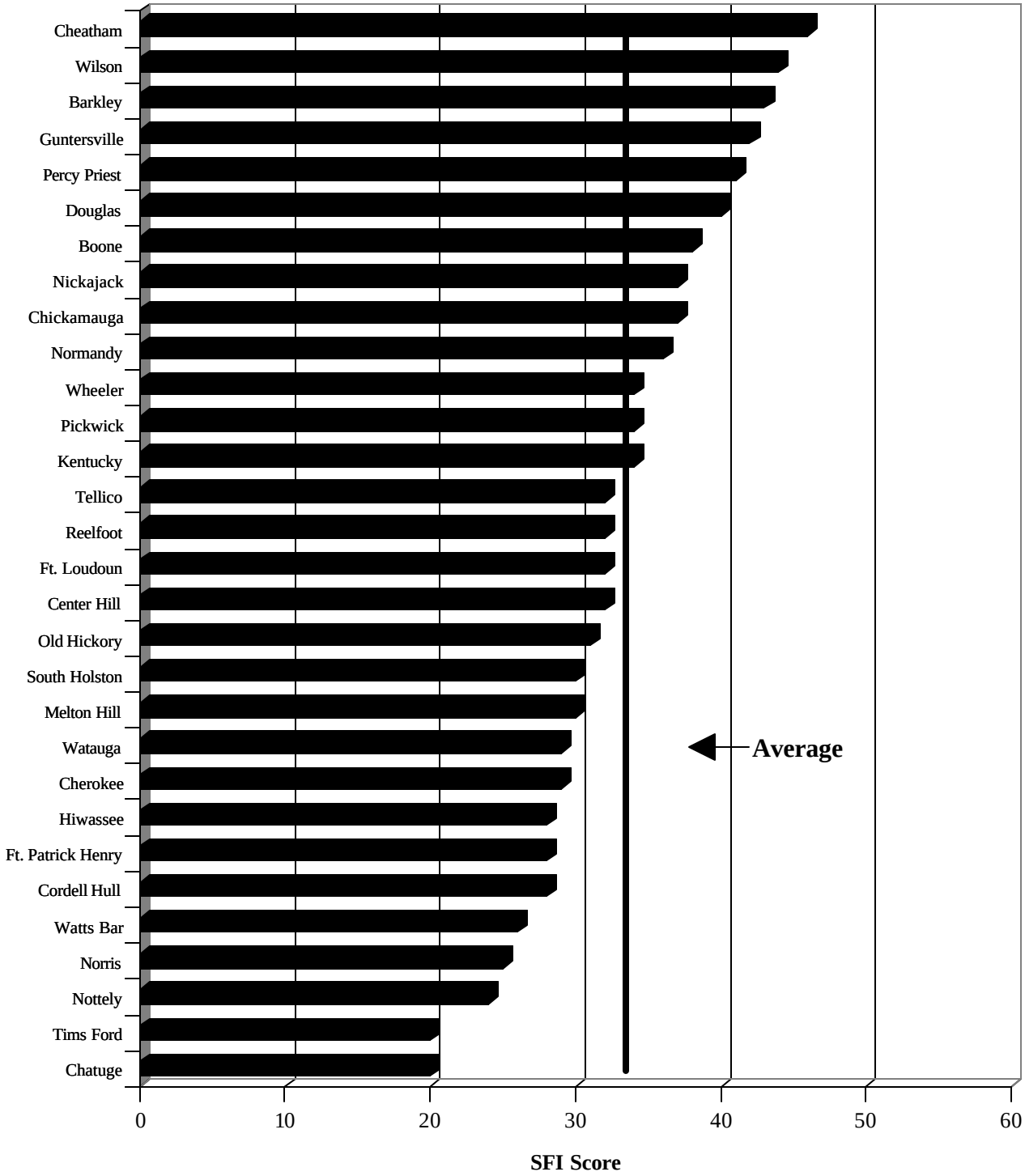

Figure 4. Comparison of largemouth bass scores for selected reservoirs during 1998.