FISHERY RESEARCH

PROJECT 5: LAKE AND RESERVOIR RESEARCH

ANNUAL PROGRESS REPORT
July 1, 2019 — June 30, 2020

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PROJECT 5: LAKE AND RESERVOIR RESEARCH

Annual Performance Report

July 1, 2019 to June 30, 2020

Project 5 – Lake and Reservoir Research

Subproject 1: Catch rates and angler preferences in community ponds with differing bag limits

By

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ANNUAL PERFORMANCE REPORT
SUBPROJECT #1: EVALUATION OF ANGLER HARVEST, CATCH RATES, AND SATISFACTION IN COMMUNITY PONDS WITH TWO- OR SIX-TROUT BAG LIMITS

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ABSTRACT

Urban and community trout fishing ponds are valuable recreational resources for anglers in Idaho because of their ease of access and often regular stocking frequency. Effective management of these fisheries requires understanding how bag limits, stocking frequency, stocking density, and angler effort affect catch rates of catchable-sized Rainbow Trout *Oncorhynchus mykiss* and angler satisfaction. In recent years, fisheries managers reduced daily bag limits at some ponds in southern Idaho's Treasure Valley from six to two trout in an effort to slow harvest and provide more consistent catch rates between stocking events. However, subsequent evaluations based on tag returns yielded ambiguous results. In this study, we evaluated how reduced bag limits affected catch rates over time between stocking events. We conducted creel surveys at four ponds with 2-trout bag limits, in addition to several with a six-trout bag limit to assess catch rates over time after stocking, while also accounting for factors such as stocking frequency and stocking density. Angler catch rates averaged 0.53 fish/h at ponds with a two-trout bag limit and 0.75 fish/h at ponds with a six-trout limit. Catch rates declined after trout stocking, but did so at similar rates in two- and six-trout ponds. Ponds stocked at weekly or bimonthly (twice monthly) frequencies had higher catch rates than ponds stocked monthly. Catch rates were negatively affected by air temperatures throughout the study. Anglers reported being somewhat or very satisfied 54% of the time at two-trout limit ponds and 64% of the time at six-trout limit ponds, and satisfaction was positively related to catch rates. Despite the four trout difference in bag limits, 58% of anglers harvested ≤2 fish at six-trout limit ponds. Anglers that harvested >2 trout accounted for 74% of trout harvested at six-trout ponds. Angler-reported tags indicated average days-at-large of stocked trout was 29 days at two-trout ponds and 17 days at six-trout ponds. Angler tag returns suggested that, on average, total use (trout harvested + trout caught-and-released) was 34% and 57% at two- and six-trout ponds. Anglers that fished community ponds represented a variety of ages and ethnicities, underscoring the importance of ponds as fisheries in Idaho. When asked how to improve fishing at these ponds, anglers most desired larger trout or more species to catch.

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INTRODUCTION

Urban and community fishing ponds are valuable recreational resources for people living in or near urban, suburban, and rural communities (Schramm and Edwards 1994; Eades and Lang 2012). Their proximity to population centers and frequent stocking schedule make them popular fishing destinations for many anglers who may not otherwise have access to such opportunities. These highly accessible fisheries can also facilitate recruitment of anglers into the sport (Balsman and Shoup 2008). These waters are often managed as put-and-take fisheries to provide instant harvest opportunities. Maintaining put-and-take fisheries is expensive and it remains important to ensure that these hatchery resources are allocated efficiently (Branigan et al. 2020). Fisheries biologists and managers are therefore faced with decisions about stocking characteristics like species, fish size, stocking density, and stocking frequency (Eades and Lang 2012). Length and bag limits on harvested fish are also tools used to optimize angler opportunities. Fisheries managers and anglers often support a reduced bag limit in urban ponds, with the expectation that the ponds will not be depleted of stocked trout as quickly, thus spreading out catch opportunities among anglers and throughout the stocking intervals. However, this expectation has rarely been formally evaluated.

In southwestern Idaho, >25 community pond fisheries are managed by the Idaho Department of Fish and Game (IDFG) to provide angling opportunities that are close to home for a variety of users. Community ponds are also integral to the agency's ongoing educational outreach efforts such as Free Fishing Day and "Take Me Fishing" trailers, which aim to recruit, retain, and reactivate anglers. The IDFG stocks these ponds with catchable-sized hatchery Rainbow Trout *Oncorhynchus mykiss* (~ 250 mm) on a weekly, bimonthly (twice monthly), or monthly basis. Estimates of angler harvest (hereafter referred to as exploitation) obtained from angler-reported tag returns indicated that at some ponds, trout were harvested very soon after stocking, thereby reducing catch rates until the next stocking event (Butts et al. 2013). In 2013, the general daily bag limit at four of these heavily-pressured ponds was reduced from six trout to a special regulation of two trout, in an effort to distribute the harvest more evenly between stocking events. Subsequent evaluations to this rule change yielded equivocal results (Butts et al. 2016).

In theory, catch rates in ponds with a six-trout limit would decline at a faster rate during stocking intervals than ponds with a two-trout bag limit, but this has not been thoroughly evaluated. Also unknown are the actual catch frequencies for anglers fishing community ponds with either of these bag limits. Given that a two-trout limit is a special regulation, credible evidence in support of such a rule is warranted prior to any further reductions of the general bag limit at additional ponds. More complex fishing rules may serve as a motivational barrier to fishing participation and would be contrary to the general philosophy of keeping community fisheries accessible. Furthermore, fishery managers have little understanding of whether restrictive bag limits result in displacement of those anglers who desire more harvest opportunity.

OBJECTIVES

1) Estimate the frequency of harvest by anglers at community ponds with two-trout and six-trout bag limits.
2) Compare angler catch rates of trout over time between stocking intervals for community ponds with two-trout and six-trout bag limits.
3) Compare days-at-large and exploitation of stocked trout in community ponds with two-trout and six-trout bag limits.

4) Evaluate effects of catch rate on angler satisfaction at community ponds.
5) Assess the level of support amongst community pond anglers for potential bag limit changes.

METHODS

Study area

Ten community ponds were originally chosen for this study and are a subset of waters regularly stocked with catchable sized Rainbow Trout and managed as put-and-take fisheries, providing instant harvest opportunities. They encompassed a variety of sizes and stocking frequencies. Four of the ten ponds have a special rule restricting daily harvest to two-trout, while six ponds are managed under general harvest rules with a six-trout daily bag limit (Table 1). In addition to surveying ponds with both bag limits, ponds were chosen based on size, frequency of stocking, and location to represent a diverse variety of ponds and angler demographics. Riley Creek Pond was only surveyed in the first month of the study and afterwards Frank Oster Lake #1 was added as a replacement. Both of these ponds have a six-trout bag limit.

Creel surveys

We estimated the relative frequency of harvested trout among anglers, catch rates, angler effort, total catch, and angler satisfaction using onsite access point creel surveys at each pond. Prior to scheduling creel surveys, ponds were grouped into pairs with contrasting two- and six-trout bag limits and proximity to each other. Days of the week were stratified into weekends (Saturday-Sunday) and weekdays (Monday-Friday). For each survey day, an eight-and-a-half-hour time block was randomly selected either to begin at sunrise or to end at sunset. A pair of ponds was randomly selected (without replacement) to be surveyed (in random order) within this time block, each survey consisting of a four-hour shift at each pond and allowing approximately 30 min for travel between ponds. Surveys took place on both weekend days and on 2-3 of the weekdays. Creel surveys were conducted from October through November in 2018 and February through June in 2019. Creel was not done in December and January due to low angler effort and reduced stocking, and not after June when high water temperatures preclude trout stocking. Creel clerks asked each angler, upon completion of their trip, how many hours he/she fished, as well as the number and species of fish caught and harvested or released. Within the first hour of each creel shift, a time was randomly selected to conduct instantaneous angler counts, which were then repeated each hour during the remainder of the shift.

Total angler effort (angler hours) on day *d* was estimated as

$$\hat{E}_d = T_d \bar{I}_d,$$

where T_d is the number of hours in a fishing day (sunrise to sunset) and $\bar{I}_d$ is the average number of anglers counted during the instantaneous counts conducted each shift. We estimated angling effort for the entire *k*th stratum as

$$\hat{E}_k = N_k \frac{\sum_{d=1}^{n_k} \hat{E}_d}{n_k},$$

where N_k is the number of days in the stratum and n_k is the number of days surveyed in the stratum. The effort for the weekend and weekday strata were then added to get the total effort for each pond for the entire survey period.

Mean daily catch rates were calculated as

$$\hat{R}_d = \frac{\sum_{i=1}^{j_d} c_{d,i}}{\sum_{i=1}^{j_d} h_{d,i}},$$

where j_d is the total number of anglers interviewed on the day d, $c_{d,i}$ is the number of trout caught by the *i*th angler on the day d, and $h_{d,i}$ is the number of hours fished by the *i*th angler on the day d. Daily catch was estimated by multiplying the daily catch rate ($\hat{R}_d$) by daily effort ($\hat{E}_d$). Catch for each stratum was estimated as

$$\hat{C}_k = N_k \frac{\sum_{d=1}^{n_k} \hat{C}_d}{n_k}.$$

In addition to standard creel data, we collected demographic information such as gender, age, ethnicity, party size, target species, and angler avidity. For completed trip interviews, anglers were asked a series of questions aimed at evaluating their satisfaction with their fishing experience and with the current two-trout or six-trout bag limit, depending on where they fished that day. We also asked questions to gauge potential support for increasing or decreasing the bag limit at community ponds, depending on the outcome of this study. To assess potential angler displacement resulting from rule changes, they were asked how likely they were to continue fishing at that pond if the bag limit were increased or decreased. Finally, we asked anglers about their motivations for fishing at that pond, and what community pond improvements they would most prefer. Part way through the study we began asking anglers to estimate their monetary expenditures in the categories of food/drink, fishing equipment, transportation, lodging, and fees, both within and outside the county. The full questionnaire is provided in Appendix 1.

Trout tagging and stocking

Prior to stocking, catchable Rainbow Trout were tagged monthly with T-bar anchor tags as part of IDFG's "Tag! You're It" program, in order to estimate angler exploitation and total use, and to estimate how long catchables persist in the fisheries (Meyer and Schill 2014). T-bar anchor tags were placed in the trout by inserting the T-bar into the base of the dorsal fin according to standard methods (Dell 1968). For each tagging event, 10% of the stocked trout were tagged with non-reward tags. Once each month, reward tags worth $50 were also implanted in stocked fish at a rate of 10% of the fish being released that day. Approximately 6% of trout were also double-tagged during each tagging event to estimate tag loss. Estimates of the percent of stocked trout harvested, and caught (i.e., harvested plus released trout), were made using IDFG's established methodology (Meyer and Schill 2014). Anglers reported tags online, using a phone hotline, or at IDFG regional offices. When reporting tags, anglers were asked a series of questions, including the date of capture, from which we calculated days-at-large from the date of stocking to the date of angler catch.

Stocking events largely consisted of catchable-sized Rainbow Trout according to the weekly, bimonthly, or monthly schedule for each pond. However, whenever leftover brood stock (>350 mm TL) became available, those larger trout were stocked into our study ponds (though they were never tagged) to provide anglers additional opportunity for trophy sized trout (Table 2).

Data analysis

Linear mixed-effects models were used to evaluate whether catch rates differed through time among ponds with different bag limits. Each angler interview was used as the unit of observation; we modeled the number of trout caught, offset by hours fished, as a function of days-post-stocking (DPS), bag limit, and an interaction between bag limit and DPS. A model structured in this way allowed us to evaluate how mean daily catch rates changed over time after each stocking event, and whether this changed depended on the bag limit. Because ponds differed in size, stocking densities (trout/ha), and stocking frequencies (weekly, bimonthly, monthly), we included these factors in the models to account for their effects on catch rates. Stocking densities of the most recent stocking event relative to each interview were used for catch-rate analysis. Because our creel survey spanned multiple seasons, we modeled the effect of average air temperature on the day of the creel survey on catch rates. Air temperature data from the nearest airport weather station was used. Catch was modeled as a function of each of the aforementioned factors individually for comparison of their relative effects. However, models that included multiple factors always included bag limit and DPS due to our objectives and hypotheses regarding their effects. Candidate models were ranked using Akaike's Information Criterion (AIC) to make inference about the factors affecting catch rates (Burnham and Anderson 1998). Confidence intervals (95%) for model coefficient estimates that did not overlap zero were used as a basis for indicating whether effects were significantly different than the reference condition.

To evaluate the effect of bag limit and catch rate on angler satisfaction, we used a multinomial logistic regression to model the odds of a person responding to a specific category on a Likert-type scale of satisfaction, which consisted of the five categories "very unsatisfied", "somewhat unsatisfied", "neutral", "somewhat satisfied", and "very satisfied" (McCormick and Porter 2014; Babbie 2016). Probabilities associated with the categories of "somewhat satisfied" and "very satisfied" were combined to comprise a satisfied category, by which a predictive relationship to catch rate and bag limit could be illustrated.

Tags reported to IDFG's "Tag! You're it!" program were used to estimate and compare days-at-large of trout stocked into each community pond. Days-at-large from day of stocking to day of angler catch represented time-to-event data. Thus we used an accelerated failure time model to evaluate differences in days-at-large for ponds with two- or six-trout daily bag limits (Therneau and Grambsch 2000; Therneau 2020). Proportions of trout harvested or caught-and-released as well as reporting rate were estimated according to Meyer and Schill (2014). Discrete tag loss (T_l) was estimated as

$$T_l = \frac{n_A^{AA}}{n_A^{AA} + 2n_{AA}^{AA}},$$

where n_A^{AA} is the number of double-tagged trout that were caught and reported with only one tag and n_{AA}^{AA} is number of double-tagged trout that were caught and reported as having both tags intact (McCormick and Meyer 2018).

All analysis was performed using Program R (R Development Core Team 2020). Linear mixed effects models were fit using the "lme4" package (Bates et al. 2015) . Accelerated failure time models were fit using the "survival" package (Therneau 2020). Multinomial models were fit using the package "nnet" (Venables and Ripley 2002).

RESULTS

Effort, catch, and harvest statistics

In total, 1,376 angler interviews were conducted during October and November of 2018 and February through June of 2019 at 11 community ponds (Table 3). Nine hundred of the interviews were from completed fishing trips. Anglers surveyed caught a total of 2,026 fish, with Rainbow Trout being the most numerous species caught, followed by Bluegill *Lepomis macrochirus*, Largemouth Bass *Micropterus salmoides*, Yellow Perch *Perca flavescens*, and Channel Catfish *Ictalurus punctatus* (Table 4). Total catch of Rainbow Trout over the study period (all ponds combined) was estimated at 92,118 (Table 5). Frank Oster Lake #1 had the highest catch of 17,198 while Parkcenter Pond had the lowest with 1,755. Total angling effort over the study period was 157,985 hours, ranging from 5,241 angler hours at Weiser Pond to 25,666 angler hours at Frank Oster Lake #1.

The relative frequency of harvest data showed that the vast majority of anglers caught two or fewer trout, regardless of the bag limit (Figure 1). At six-trout ponds, 43% of anglers harvested three or more trout, yet these anglers accounted for 74% of the harvested trout. A similar pattern occurred when considering all fish caught (harvested + released; Figure 2.)

Mean catch rates of Rainbow Trout were 0.76 fish/h at six-trout ponds and 0.53 fish/h at two-trout ponds (Table 6). This disparity was inconsistent among ponds with different stocking frequencies and stocking densities, however. Ponds stocked on a bimonthly basis had the highest catch rates (0.70 fish/h at six-trout ponds, 0.74 fish/h two-trout ponds), followed by ponds stocked weekly (0.64 fish/h at six-trout ponds, 0.55 fish/h at two-trout ponds) and monthly (0.64 fish/h at six-trout ponds, 0.37 fish/h at two-trout ponds), respectively (Figure 3).

The top ranking candidate model predicted that bag limit, DPS, temperature, stocking density (of the most recent stocking event), and stocking frequency all contributed to variation in catch rates (Table 7). Catch rates did indeed decline with time after stocking (i.e., DPS), but the rates at which they did so at two- and six- trout ponds was similar (Figure 4; Table 8). The top model indicated that catch rates also declined with increased air temperatures. The inclusion of an interaction between DPS and temperature means that the negative effect of temperature on catch rates was exacerbated as more time elapsed since stocking (Figure 5). Additionally, ponds stocked monthly had lower catch rates than those stocked bimonthly or weekly (Table 8). Though catch rates appeared higher at six-trout ponds, the confidence interval for effect of bag limit overlapped zero, suggesting no statistical difference from two-trout pond catch rates. Likewise, any effect of stocking density on catch rates was relatively minor compared to other sources of variation in the data.

Tag returns

In total, 2,519 T-bar anchor tagged trout were released with the regularly scheduled stocking events throughout the duration of this study. Of these, 53 were $50 reward tags. Discrete tag reporting rate was 52.4% and discrete tag loss was 3% over the duration of this study. Total use of stocked trout ranged from 10.8% at Parkcenter Pond to 83.9% at Filer Pond (Table 9). Total use averaged 56.7% at six-trout ponds and 33.5% at two-trout ponds.

Days-at-large averaged 16.9 d at six-trout ponds and 28.7 d at two-trout ponds. The accelerated failure time model fit to the tag return data indicated that on average trout remained

at large 1.46 (95% CI: 1.11–1.91) times ($e^{0.377}$) longer at ponds with a two-trout bag limit than ponds with a six-trout limit (Table 10).

Angler demographics

The average age of community pond anglers was 42 years and varied from 10 to 88 (Figure 6). Female anglers accounted for 14% of interviewees. Fourteen ethnicities were reported, with white (85%) and Hispanic (11%) making up most of the anglers (Table 11). The size of fishing party averaged 2.21 and varied from 1 to 13. Twenty-nine percent of respondents were fishing with children under the age of 14. Anglers on average traveled 15.8 km (median: 8, min-max: 0-805 km) to fish these ponds. Anglers reported fishing an average of 60 days per year and 27 days per year specifically at community ponds. Of the 1,284 anglers that reported their skill level, 20% were novice, 54% were intermediate, and 26% were advanced. Average catch rates differed among these self-reported skill level categories, with participants being largely accurate about their relative skill (Figure 7). Respective catch rates (fish/h) for two- and six-trout pond anglers were 0.35 and 0.40 for novice anglers, 0.52 and 0.59 for intermediate skill anglers, and 0.69 and 0.90 for advanced anglers. Demographically, no noteworthy differences existed between anglers interviewed at two-trout and six-trout ponds.

Seventy-nine percent of respondents reported their target species was Rainbow Trout or trout, 11% reported fishing for “anything that bites”, 3% were targeting bass, and the remaining anglers were fishing for catfish, perch, bluegill, or some combination of the aforementioned species. Most (65%) anglers were fishing with bait (e.g., worms, Powerbait, salmon eggs), 17% were using lures, 2% were using flies, and the rest were fishing with more than one type of terminal tackle.

Angler opinion surveys

Of the 839 anglers that responded, 63% reported being somewhat or very satisfied with their fishing experience at six-trout ponds, whereas 55% of anglers were somewhat or very satisfied at two-trout ponds (Figure 8; Table 12). Based on the multinomial logistic regression modeling satisfaction responses, there was no difference in fishing experience satisfaction between two- and six- trout ponds. Rather, probability of satisfaction was related to an individual’s catch rate that day (Figure 9; Table 13).

Most anglers were also somewhat or very satisfied with the bag limit at the pond where they were fishing (Figure 10; Table 12). When asked how likely they would be to support a regulation change from six to two trout bag limit, if it were shown to improve fishing, 75% and 59% of anglers at two- and six-trout ponds, respectively, responded in the somewhat or very likely categories (Figure 11; Table 12). Most anglers at all ponds also supported a bag limit increase from two to six trout at those ponds if the reduced bag limit was not improving fishing (Figure 12; Table 12). If bag limits were to change, 14% of anglers at six trout ponds indicated they were not likely to fish that pond in the future (Figure 13; Table 12). The primary reason anglers gave for selecting a particular pond to fish was proximity to home rather than quality of fishing or other factors (Figure 14; Table 12). When asked to choose from potential community pond improvements, anglers most often chose larger trout, followed by more species; more trout and improved amenities were least often chosen (Figure 15; Table 12).

Angler spending

Anglers reported trip spending in 962 interviews. The average amount spent per angler trip was $15.10 across all categories and all ponds (Table 14). Frank Oster #1 ranked the highest in spending at $24.67 per trip while Weiser pond anglers spend a low of $8.75 on average. Anglers spent the most on supplies (43%), followed by food and beverage (30%), fuel (26%), lodging (1%), and fees (0%).

DISCUSSION

The effect of community pond daily bag limits on catch rates over time was the driving impetus for this study. Specifically, we sought to learn whether a reduction in bag limit from six to two trout resulted in a slower decline in catch rates between stocking events. As expected, our data showed that catch rates declined with time after a fish stocking event. However, the rates of decline were similar between two- and six-trout ponds, suggesting no beneficial slowing of harvest at ponds with a reduced daily bag limit. At ponds with a six-trout bag limit, most of the anglers (58%) did not harvest more than two fish, suggesting that at two-trout ponds, many anglers' harvest opportunities were not limited by the regulation. Although tagged fish persisted longer in ponds with a two-trout limit, exploitation and use of those fish was lower than at ponds with a six-trout limit.

Temperature and stocking frequency influenced catch rates to a greater extent than bag limit. As daily air temperatures increased in late spring, catch rates decreased, particularly in ponds stocked only once per month. Although air temperatures were used in this study, they typically correlate with water temperatures in smaller waterbodies like the ponds in this study. Therefore, the water temperatures may have negatively affected the activity, catchability, or survival of the stocked trout. Stocking frequencies proved to be important in catch rates as well. Ponds stocked once per month had lower catch rates than ponds stocked bimonthly or weekly. Although not as influential as other factors, stocking density did account for some of the observed variation in catch rates, and must be considered alongside decisions regarding stocking frequency. Given that our hatchery system is typically functioning at full capacity, more frequent stocking would require fewer fish per stocking event, due to a limited number of available fish. In this study higher than average stocking densities occurred during one of two scenarios. The first scenario coincided with high temperatures in early summer, just before Free Fishing Day. This time of year is near the end of the typical trout stocking schedule when community ponds are stocked in high densities in anticipation of Free Fishing Day. The second scenario is in early October when stocking has resumed after being halted during the hottest part of the summer. During this time ponds are stocked at high densities to overcompensate for not being stocked during the previous two or three months. Both scenarios of higher than normal stocking densities occur during relatively warm temperatures. Therefore, effects of stocking densities were confounded by temperature and warrant more rigorous examination.

We hypothesized that the two-trout bag limit would result in stocked trout persisting longer, thereby distributing catch more evenly between stocking intervals. While tag-return data showed that trout did in fact last longer at two-trout ponds, the overall exploitation rates of those fish never matched those of six-trout ponds. One possible reason may be that the uncaught fish simply do not survive very long if they are not caught within a given window of time. Several studies have demonstrated the poor survival and longevity among catchable-sized hatchery trout (Miller 1952, 1954; High and Meyer 2009). Or perhaps harvest-oriented anglers specifically go to ponds with more liberal bag limits. Another possibility is that, because of the two-trout limit, there was low

compliance with the rules and lower than normal tag reporting rates, and that we underestimated harvest based on tag returns. Our staff did receive anecdotal reports from anglers of bag limit violations by other anglers, and our catch data also indicated some degree of overharvest (possibly unintentional). However, even at the six-trout ponds, most people did not catch more than two fish, so the possibility of non-compliance significantly skewing catch-rates is unlikely.

The results of our demographic survey demonstrate that the community ponds in the southwest region of Idaho serve a range of angler skill levels and ages. The range of ethnicities reported by interviewees largely reflects that of Idaho's major population center. The wide range of ages reported also reflects the variety of users groups. The fact that almost a third of respondents indicated the presence of youth under the age of 14 suggests that these fisheries serve an important role in recruitment of young people into the sport of fishing. The importance of community and urban ponds in recruitment is well-recognized in the literature (Balsman and Shoup 2008). While ponds are important for recruiting new anglers, the age range and number of days fished per year suggest substantial effort from experienced anglers as well. Butts et al. (2013) reported similar demographic results for Idaho community ponds, where the average years of angling experience was 27 years. The substantial proportion of anglers above age 65 also confirms the importance of these fisheries to people of retired age, who may not have other fishing opportunities. Furthermore, the respondents indicated that on average almost 50% of their fishing days each year took place at community ponds, suggesting that community ponds are a significant recreational resource even for avid and experienced anglers.

Our creel surveys indicated that, regardless of the pond at which the anglers were fishing, most people caught ≤2 trout. Nevertheless, most were either somewhat or very satisfied with both their fishing experience and the existing bag limit at that pond. In fact, satisfaction was strongly related to catch rate, which concurs with existing literature on the subject (McCormick and Porter 2014). Most anglers in our study caught fewer than two trout, thus their harvest opportunity was not actually constrained by the daily bag limit. Therefore, an opportunity exists for increasing angler satisfaction if catch rates could somehow be improved. This could be achieved in various ways. When asked to choose among four feasible options to improve community pond management, the choice most often selected was for the stocking of larger trout. Previous research demonstrating the positive effect of fish length on return-to-creel rates in Idaho fisheries suggests that stocking larger trout may improve exploitation and catch rates in community ponds (Cassinelli and Meyer 2018). If catch rates increased due to larger trout, our results suggest that angler satisfaction would increase as well.

MANAGEMENT RECOMMENDATIONS

1. Given that most people do not catch more than two trout, and that catch rates did not decline more quickly with a six trout daily bag limit, it is not recommended that bag limits be reduced from six to two at additional community ponds. Furthermore, although anglers were equally satisfied with either bag limit, overall satisfaction with their fishing experience was slightly higher at ponds with a six-trout bag limit, owing to higher catch rates. Even though trout persisted longer at two-trout ponds, exploitation and use remained lower than at six-trout ponds. If any of the two-trout bag limits at ponds in this study are increased to six trout, catch rates should be evaluated to see if they increase; if not, perhaps some other factor inherent to those ponds is the cause.

2. Stocking larger trout (i.e., magnums) should be evaluated in community ponds. Given a suite of potential pond improvements, anglers in this study expressed their desire for larger

trout above other options. Given the evidence in the literature that larger trout return to the creel at higher rates and that fish size is correlated with angler satisfaction, such a management strategy has potential for success.

3. Besides larger trout, anglers express interest in the opportunity to catch different species. This suggests an opportunity for managers to diversify community pond fisheries by increasing the variety of species anglers can pursue, especially in warmer summer months when water temperatures preclude trout stocking. In waters where this already occurs, simply increasing the abundance of those other species may improve catch rates or angler satisfaction.

4. Because stocking frequency and stocking density affected catch rates, ponds should be stocked on a bimonthly or weekly basis at intermediate densities. Future research is warranted for optimizing the effects of stocking densities and frequencies on return-to-creel at other community ponds.

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TABLES

Table 1. Community pond fisheries included in creel surveys (Oct-Nov 2018, Feb-Jun 2019), their surface area, bag limit, and typical stocking frequency. Bimonthly stocking frequency refers to twice monthly.

Fishery	Bag limit	IDFG Region	Surface area (ha)	Stocking frequency
Filer Pond	6	4	0.97	bimonthly
Kleiner Pond	6	3	1.74	bimonthly
Marsing Pond	6	3	1.66	monthly
McDevitt Pond	2	3	0.53	bimonthly
Frank Oster Lake #1	6	4	2.02	weekly
Parkcenter Pond	2	3	3.24	monthly
Riley Creek Pond	6	4	11.66	weekly
Riverside Pond	6	3	1.17	bimonthly
Sego Prairie	6	3	0.65	monthly
Weiser Pond	2	3	0.49	monthly
Wilson Springs Pond	2	3	2.83	weekly

Table 2. Rainbow Trout stocking data for each fishery during this study, including size class, number of trout stocked, number of fish per pound (FPP), total pounds, and average total length at time of stocking. Multiple stocking events for a given fishery and size category are combined. (Source: IDFG stocking database)

Fishery	Size category	Number	FPP	Pounds	Average length (in.)
Filer Pond	Catchable (6+ inches)	5,932	2.44	2,465	10.1
	Catchable (12-14 inches)	3,838	1.42	2,729	12.2
	Catchable (15-19 inches)	467	0.39	1,208	17.9
	Brood	658	0.25	2,786	22.2
Frank Oster Lake #1	Catchable (6+ inches)	13,977	2.29	6,340	10.3
	Catchable (12-14 inches)	3,688	1.41	2,460	12.2
	Catchable (15-19 inches)	258	0.50	707	16.8
	Brood	382	0.20	2,064	24.3
Kleiner Pond	Catchable (6+ inches)	9,367	2.61	3,490	9.9
	Catchable (12-14 inches)	410	1.17	370	13.0
	Catchable (15-19 inches)	477	0.47	1,065	17.1
	Brood	549	0.31	1,737	20.1
Marsing Pond	Catchable (6+ inches)	7,161	2.68	2,698	9.8
McDevitt Pond	Catchable (6+ inches)	9,863	2.57	3,915	10.0
	Catchable (15-19 inches)	165	0.37	473	18.0
	Brood	220	0.33	667	19.6
Parkcenter Pond	Catchable (6+ inches)	9,726	2.57	3,848	10.0
Riley Creek Pond	Catchable (6+ inches)	14,146	2.29	6,315	10.3
	Catchable (12-14 inches)	3,708	1.50	2,256	11.9
	Catchable (15-19 inches)	251	0.52	694	16.5
	Brood	711	0.19	3,789	24.8
Riverside Pond	Catchable (6+ inches)	8,829	2.51	3,508	10.1
Sego Prairie	Catchable (6+ inches)	1,974	2.57	781	10.0
	Catchable (12-14 inches)	256	1.17	230	13.0
	Catchable (15-19 inches)	217	0.54	416	16.7
	Brood	85	0.29	283	20.6
Weiser Community Pond	Catchable (6+ inches)	5,040	2.52	2,037	10.0
Wilson Springs North Pond	Catchable (6+ inches)	15,179	2.62	5,847	9.9
Wilson Springs South Pond	Catchable (6+ inches)	5,641	2.59	2,146	10.0
Wilson Springs Trophy Pond	Catchable (6+ inches)	5,802	2.59	2,222	10.0

Table 3. Community ponds surveyed, the number of survey days, and the number and type of interviews conducted. All survey data was used for demographic summaries. Only complete trip data was used for catch-rate analyses.

Fishery	Survey days	Incomplete	Complete
Filer Pond	19	48	65
Kleiner Pond	26	82	130
Marsing Pond	22	34	104
McDevitt Pond	23	44	120
Oster Lake #1**	7	26	30
Parkcenter Pond	24	61	98
Riley Creek Pond*	3	6	2
Riverside Pond	32	73	111
Sego Prairie	22	23	56
Weiser Pond	14	5	44
Wilson Springs Complex	25	74	140

*Riley Creek Pond was only surveyed during October 2018 and subsequently dropped from the study.
**Oster Lake # 1 surveys began in February 2019 as a replacement water for Riley Creek Pond

Table 4. Species of fish reported caught and harvested or released during creel surveys.

Species	Number caught	Harvested	Released
Rainbow Trout	1,638	715	923
Bluegill	233	8	225
Largemouth Bass	99	1	98
Yellow Perch	49	12	37
Channel Catfish	7	4	3

Table 5. Total catch of stocked Rainbow Trout and total effort (angler hours) for each pond during the months of Oct-Nov 2018 and Feb-Jun 2019.

Fishery	Total catch	Total effort
Filer Pond	15,050	14,756
Frank Oster Lake #1**	17,198	25,667
Kleiner Pond	8,144	21,834
Marsing Pond	8,220	15,044
McDevitt Pond	8,224	14,050
Parkcenter Pond	1,756	9,881
Riley Creek Pond*	3,971	9,763
Riverside Pond	7,423	10,861
Sego Prairie	3,143	8,074
Weiser Pond	4,402	5,241
Wilson Springs Complex	14,587	22,811
Grand Total	92,119	157,985

*Riley Creek Pond was only surveyed during October 2018 and subsequently dropped from the study.

**Oster Lake # 1 surveys began in April 2019 as a replacement water for Riley Creek Pond

Table 6. Bag limit, stocking frequency, and summary statistics of Rainbow Trout catch rates and stocking densities for each community pond during the creel survey (Oct-Nov 2018, Feb-Jun 2019).

		Catch rate (fish/h)			Stocking density (fish/ha)			
Fishery	Bag limit	Mean	Min	Max	Mean	Min	Max	Frequency
Filer Pond	6	1.3	0.0	10.0	306.1	51.5	708.2	bimonthly
Frank Oster Lake #1**	6	0.7	0.0	4.0	588.5	41.2	2,036.1	weekly
Kleiner Pond	6	0.4	0.0	6.2	299.9	102.3	1,077.6	bimonthly
Marsing Pond	6	0.7	0.0	6.9	291.0	266.3	330.7	monthly
McDevitt Pond	2	0.7	0.0	7.0	931.2	160.4	1,769.8	bimonthly
Parkcenter Pond	2	0.1	0.0	1.2	238.9	227.8	260.5	monthly
Riley Creek Pond*	6	0.3	0.0	0.7	48.5	6.4	160.7	weekly
Riverside Pond	6	1.1	0.0	11.3	379.6	291.5	641.0	bimonthly
Sego Prairie	6	0.4	0.0	4.1	330.4	130.8	480.0	monthly
Weiser Pond	2	1.1	0.0	6.0	1,025.7	963.3	1,149.0	monthly
Wilson Springs Complex	2	0.5	0.0	6.0	90.5	42.8	170.3	weekly

*Riley Creek Pond was only surveyed during October 2018 and subsequently dropped from the study.

**Oster Lake # 1 surveys began in April 2019 as a replacement water for Riley Creek Pond

Table 7. Comparison of generalized linear mixed-effects models individual angler catch (number of fish offset by hours of effort) as a function of bag limit, days-post-stocking (DPS), average air temperature on day of interview (Temp), stocking density of most recent stocking event (SD; fish/ha), and stocking frequency (Freq). Degrees of freedom (K), Akaike's Information Criterion (AIC_c), change in AIC_c (ΔAIC_c), and AIC_c weight (ω) were used to rank the candidate models. SD and Temp were scaled to a standard normal distribution. Fishery and survey date were included as random effects in all the models. Models

Model	**K**	**AICc**	**Δ AICc**	**ω**
Catch ~ Bag + DPS * Temp + SD + Freq	10	2840.83	0	0.999934
Catch ~ Bag + Temp * SD + DPS	8	2861.42	20.59	3.40E-05
Catch ~ Bag + Temp * SD + $Temp^2$ + DPS	9	2862.38	21.55	2.10E-05
Catch ~ Bag + Temp + $Temp^2$ + DPS * SD	9	2863.67	22.84	1.10E-05
Catch ~ DPS * Bag + Temp	7	2872.21	31.38	0
Catch ~ DPS + Temp + $Temp^2$ + Bag + DPS * Bag	8	2873.01	32.18	0
Catch ~ Bag + DPS + Temp + SD	7	2881.17	40.34	0
Catch ~ Bag + Temp + $Temp^2$+ DPS + SD	8	2881.47	40.65	0
Catch ~ Bag + SD + Temp + DPS + Freq	9	2882.34	41.51	0
Catch ~ Temp + $Temp^2$	5	2883.46	42.63	0
Catch ~ Temp	4	2883.75	42.92	0
Catch ~ DPS * Bag	6	2897.18	56.35	0
Catch ~ DPS	4	2904.78	63.95	0
Catch ~ DPS + Bag	5	2906.13	65.31	0
Catch ~ Effort	4	2909.61	68.78	0
Catch ~ 1	3	2909.97	69.14	0
Catch ~ Freq	5	2910.41	69.58	0
Catch ~ Bag	4	2911.1	70.27	0
Catch ~ SD	4	2911.27	70.44	0
Catch ~ FPP	4	2911.86	71.03	0

Table 8. Model coefficient estimates, standard errors (SE), 95% confidence intervals (CI), z-statistics (z) and P-values for the highest ranked linear mixed-effects model of catch (number of fish offset by hours of effort) as a function of bag limit, days-post-stocking (DPS), stocking density MSD;fish/ha), stocking frequency, and mean air temperature on the day of the interview Temp. The respective reference categories for bag limit and stocking frequency are two trout and bimonthly (twice monthly).

	Estimate	**SE**	**CI**	**z**	**P-value**
(Intercept)	-0.200	0.268	-0.792 – -0.366	-0.746	0.456
Bag limit (six trout)	0.206	0.231	-0.318 – 0.707	0.894	0.372
DPS	-0.057	0.008	-0.074 – -0.041	-6.922	<0.001
Temp	-0.283	0.104	-0.491 – -0.075	-2.728	0.006
SD	0.137	0.100	-0.075 – 0.328	1.364	0.173
Temp × DPS	-0.031	0.005	-0.040 – -0.021	-6.514	<0.001
Freq (weekly)	-0.416	0.301	-1.081 – 0.233	-1.383	0.167
Freq (monthly)	-0.603	0.266	-1.146 – 0.006	-2.267	0.023

Table 9. Non-reward and $50 reward T-bar anchor tags were affixed to stocked trout at each pond in this study on a monthly basis. Angler reported tag returns were used to calculate angler exploitation and total use.

		Tags released		**Angler exploitation**		**Angler total use**	
Water Body	**Bag limit**	**Non-reward**	**$50 Reward**	**Estimate**	**90% CI**	**Estimate**	**90% CI**
Filer Pond	six	128	3	0.66	0.26	0.84	0.32
Frank Oster Lake #1	six	191	5	0.42	0.17	0.53	0.21
Kleiner Pond	six	270	6	0.24	0.10	0.35	0.14
Marsing Pond	six	245	5	0.38	0.15	0.58	0.22
McDevitt Pond	two	259	6	0.16	0.08	0.32	0.13
Parkcenter Pond	two	444	7	0.05	0.03	0.11	0.05
Riley Creek Pond	six	36	0	0.00		0.05	0.09
Riverside Pond	six	208	6	0.31	0.13	0.46	0.18
Sego Prairie Pond	six	108	4	0.48	0.21	0.64	0.26
Weiser Pond	two	293	6	0.12	0.06	0.32	0.13
Wilson Springs Complex	two	284	5	0.36	0.14	0.59	0.22

Table 10. Model coefficient estimates, standard errors (SE), 95% confidence intervals (CI), z-statistics (z), and *P*-values for an accelerated failure time model relating days-at-large of angler-caught tagged-fish to bag limit at their respective ponds. This model used a Weibull distribution, the scale of which is also reported, distinguishing it from an exponential distribution.

	Estimate	**SE**	**CI (95%)**	**z**	**p**
(Intercept)	2.662	0.087	2.49-2.83	30.670	<0.001
Bag limit (two trout)	0.377	0.138	0.11-0.65	2.750	0.006
Log(scale)	0.448	0.033	N/A	13.500	<0.001

Table 11. Number (n) and percent (%) of angler-reported ethnicities during creel surveys.

Ethnicity	**n (%)**
African American	10 (0.8)
Asian	23 (1.80)
Filipino	2 (0.2)
Guatemalan	1 (0.1)
Hispanic	137 (10.7)
Indian	3 (0.2)
Iranian	1 (0.1)
Iraqi	1 (0.1)
Native American	13 (1.0)
Pacific Islander	2 (0.2)
Polynesian	3 (0.2)
Turkish	1 (0.1)
Ukrainian	1 (0.1)
White	1,080 (84.5)

Table 12. Numbers (n) and proportions (P) of responses to questions by anglers interviewed at community ponds with two or six trout bag limits.

	Two-trout Ponds		Six-trout Ponds	
	n	***P***	***n***	***P***
How satisfied are you with your current fishing experience?				
Very unsatisfied	23	0.06	34	0.07
Somewhat unsatisfied	54	0.14	33	0.07
Neutral	94	0.25	103	0.22
Somewhat satisfied	102	0.27	119	0.26
Very satisfied	102	0.27	175	0.38
How satisfied are you with the bag limit at this pond?				
Very unsatisfied	17	0.05	32	0.07
Somewhat unsatisfied	26	0.07	28	0.06
Neutral	56	0.15	74	0.16
Somewhat satisfied	57	0.15	73	0.16
Very satisfied	217	0.58	252	0.55
If it would improve fishing, how likely are you to support a two trout bag limit?				
Very unlikely	32	0.06	122	0.17
Somewhat unlikely	24	0.04	65	0.09
Neutral	74	0.14	117	0.16
Somewhat likely	73	0.13	98	0.14
Very likely	339	0.63	323	0.45
If a two trout bag limit does not improve fishing at ponds currently with that rule, how				
Very unlikely	93	0.17	51	0.07
Somewhat unlikely	40	0.07	18	0.03
Neutral	128	0.24	161	0.23
Somewhat likely	60	0.11	98	0.14
Very likely	220	0.41	384	0.54
How likely are you to fish this pond in the future if the bag limit changes?				
Very unlikely	11	0.02	64	0.09
Somewhat unlikely	6	0.01	36	0.05
Neutral	81	0.15	88	0.12
Somewhat likely	66	0.12	104	0.14
Very likely	379	0.7	432	0.6
What is your primary motivation for fishing here?				
Close to home	266	0.61	374	0.65
Quality of fishing	67	0.15	80	0.14
Amenities	16	0.04	30	0.05
Other	86	0.2	87	0.15
Which of the following would you most consider an improvement?				
Larger trout	165	0.17	229	0.23
More species	125	0.13	169	0.17
More trout	71	0.07	126	0.13
Improved amenities	64	0.06	46	0.05

Table 13. Parameter estimates, standard errors, and confidence limits for the multinomial logistic regression model that estimated satisfaction level of community pond anglers on a five-point Likert scale. Coefficients are odds ratios relative to the reference category of satisfaction level one.

			Confidence limits	
Variable	**Estimate**	**SE**	**2.50%**	**97.50%**
	Satisfaction level two			
Intercept	2.148	1.289	1.305	3.533
Catch rate	2.959	2.030	0.739	11.855
Bag limit (six trout)	0.403	1.418	0.203	0.799
	Satisfaction level three			
Intercept	3.165	1.269	1.985	5.047
Catch rate	6.532	1.926	1.808	23.601
Bag limit (six trout)	0.697	1.360	0.381	1.273
	Satisfaction level four			
Intercept	3.072	1.268	1.928	4.893
Catch rate	8.434	1.922	2.344	30.349
Bag limit (six trout)	0.726	1.358	0.399	1.322
	Satisfaction level five			
Intercept	2.552	1.273	1.592	4.093
Catch rate	10.776	1.921	2.997	38.739
Bag limit (six trout)	1.029	1.357	0.565	1.871

Table 14. Direct angler spending per trip on food and beverage, supplies, transportation, lodging, and fees within and outside the county where they were fishing.

		Food and beverage ($)		Supplies ($)		Fuel ($)		Lodging ($)		All categories ($)				Per trip ($)		
Fishery	Angler trips (n)	In county	Outside county	In county	Outside county	In county	Outside county	In county	Outside county	In county	Outside county	Total		In county	Outside county	Total
Frank Oster #1	55	505	13	321	0	438	80	0	0	1264	93	1357		22.98	1.69	24.67
Marsing Pond	91	568	222	483	246	243	214	0	0	1294	682	1975		14.21	7.49	21.70
Filer Pond	76	492	50	328	60	444	35	0	0	1264	145	1409		16.63	1.91	18.53
Wilson Springs Pond	116	232	94	850	268	306	117	0	0	1388	479	1867		11.96	4.13	16.09
Kleiner Pond	160	520	77	1035	23	458	38	110	0	2122	138	2260		13.26	0.86	14.12
Sego Prairie	61	150	10	485	3	142	17	0	0	777	30	807		12.73	0.49	13.22
Riverside Pond	110	351	5	626	7	295	40	0	0	1272	52	1324		11.56	0.47	12.03
McDevitt Pond	119	399	0	611	0	359	0	0	0	1369	0	1369		11.51	0.00	11.51
Park Center Pond	132	329	47	587	4	376	30	0	0	1291	81	1372		9.78	0.61	10.39
Weiser Pond	42	83	35	151	0	48	51	0	0	282	86	368		6.70	2.05	8.75
Total	962	4181		6086		3728		110		12320	1785	14105	**Avg**	13.13	1.97	15.10

FIGURES

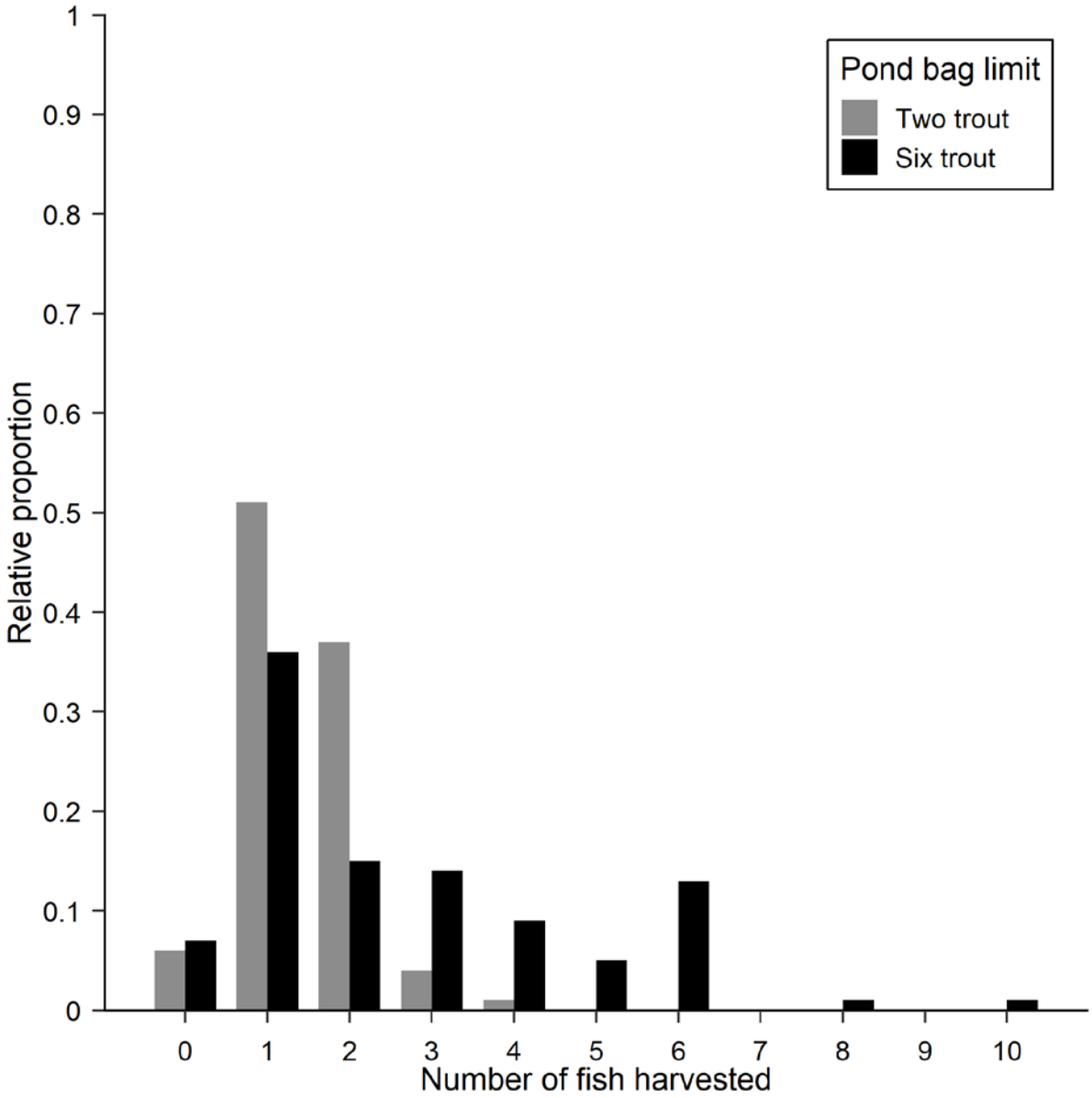

Figure 1. Relative frequency of Rainbow Trout harvested by anglers at ponds where the daily bag limit is either two or six trout.

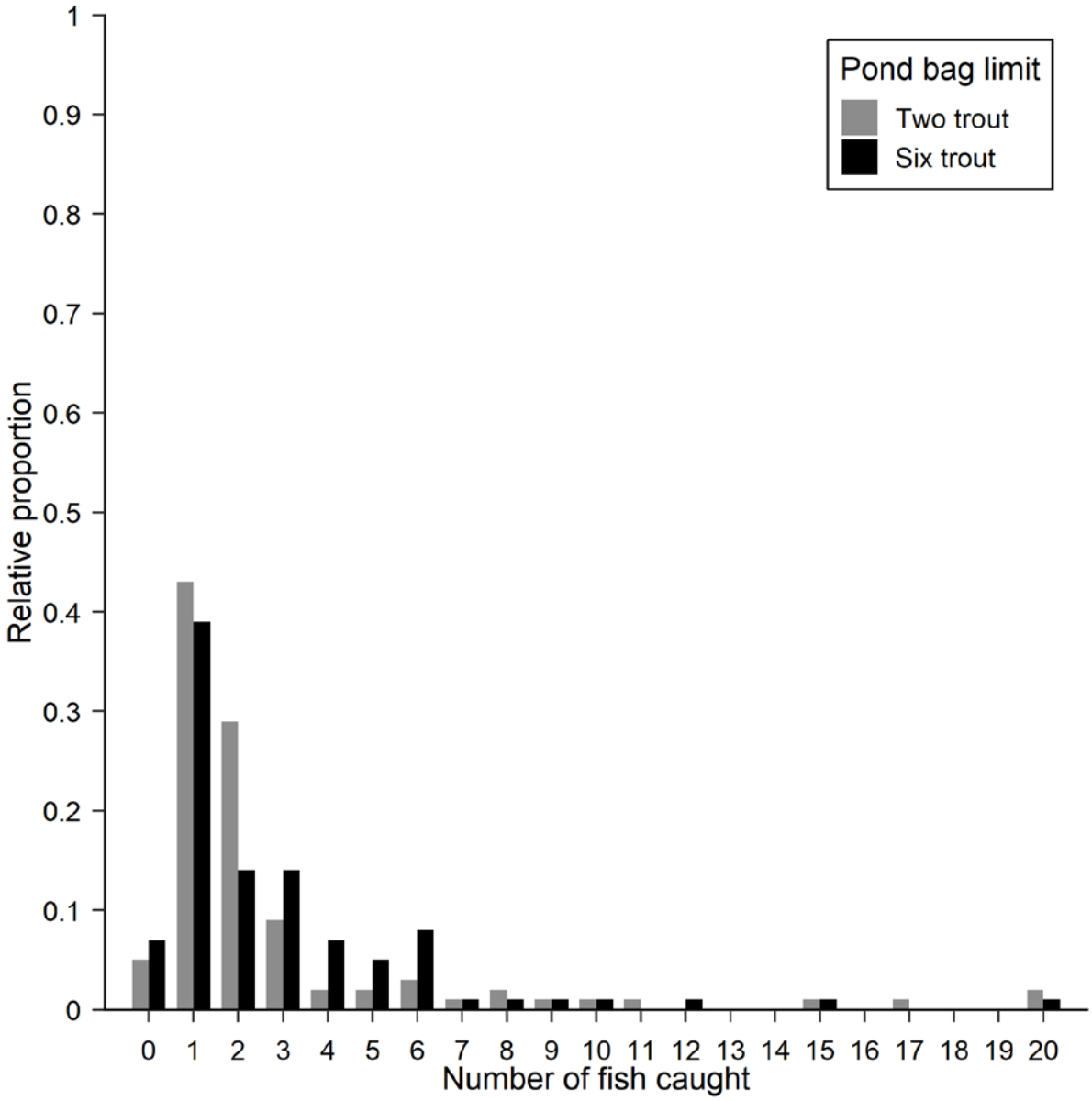

Figure 2. Relative frequency of Rainbow Trout caught by anglers at ponds where the daily bag limit is either two or six trout.

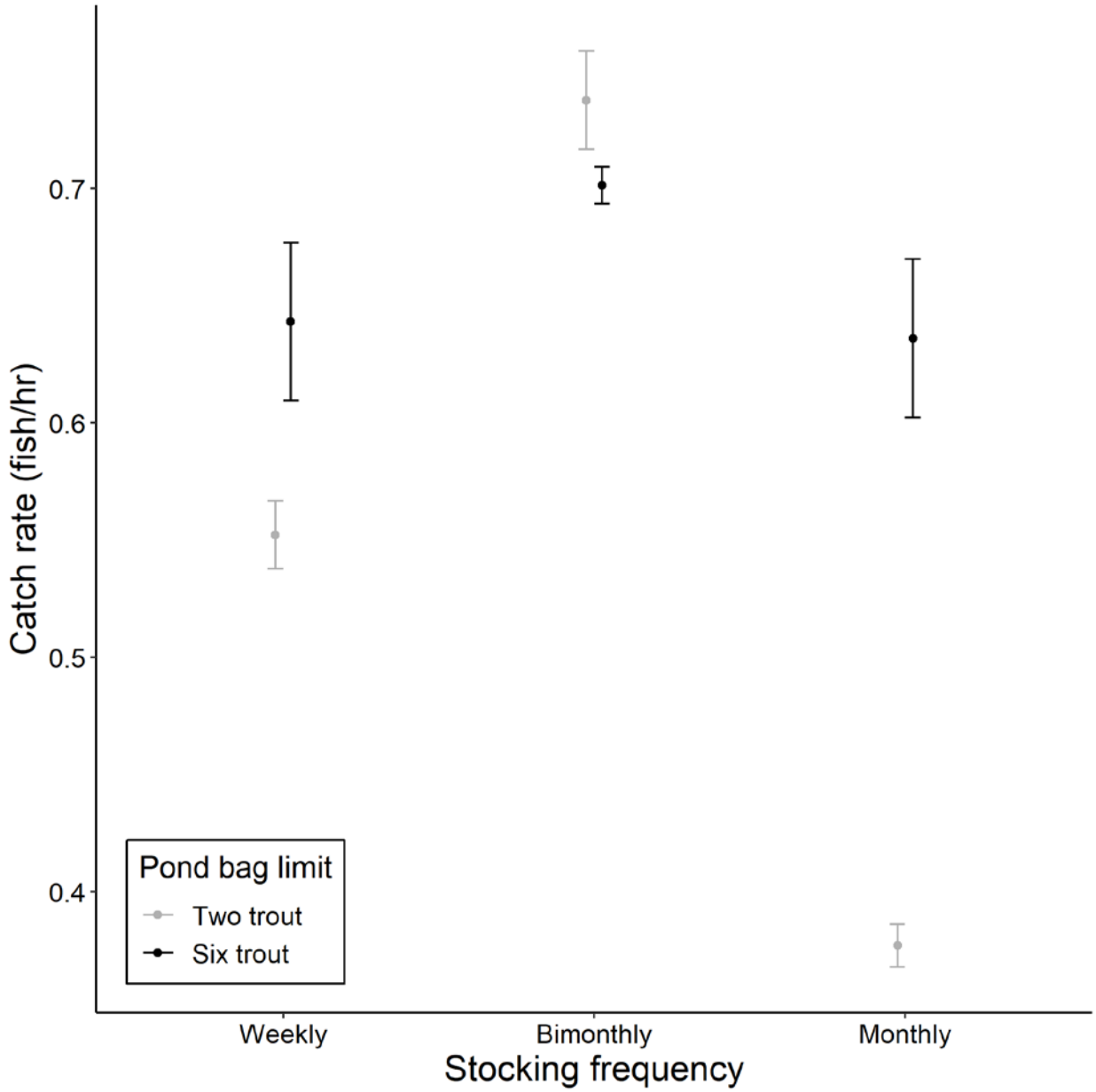

Figure 3. Mean catch rates (fish/h) of Rainbow Trout bounded by 95% confidence intervals for ponds with differing bag limits and stocking frequencies.

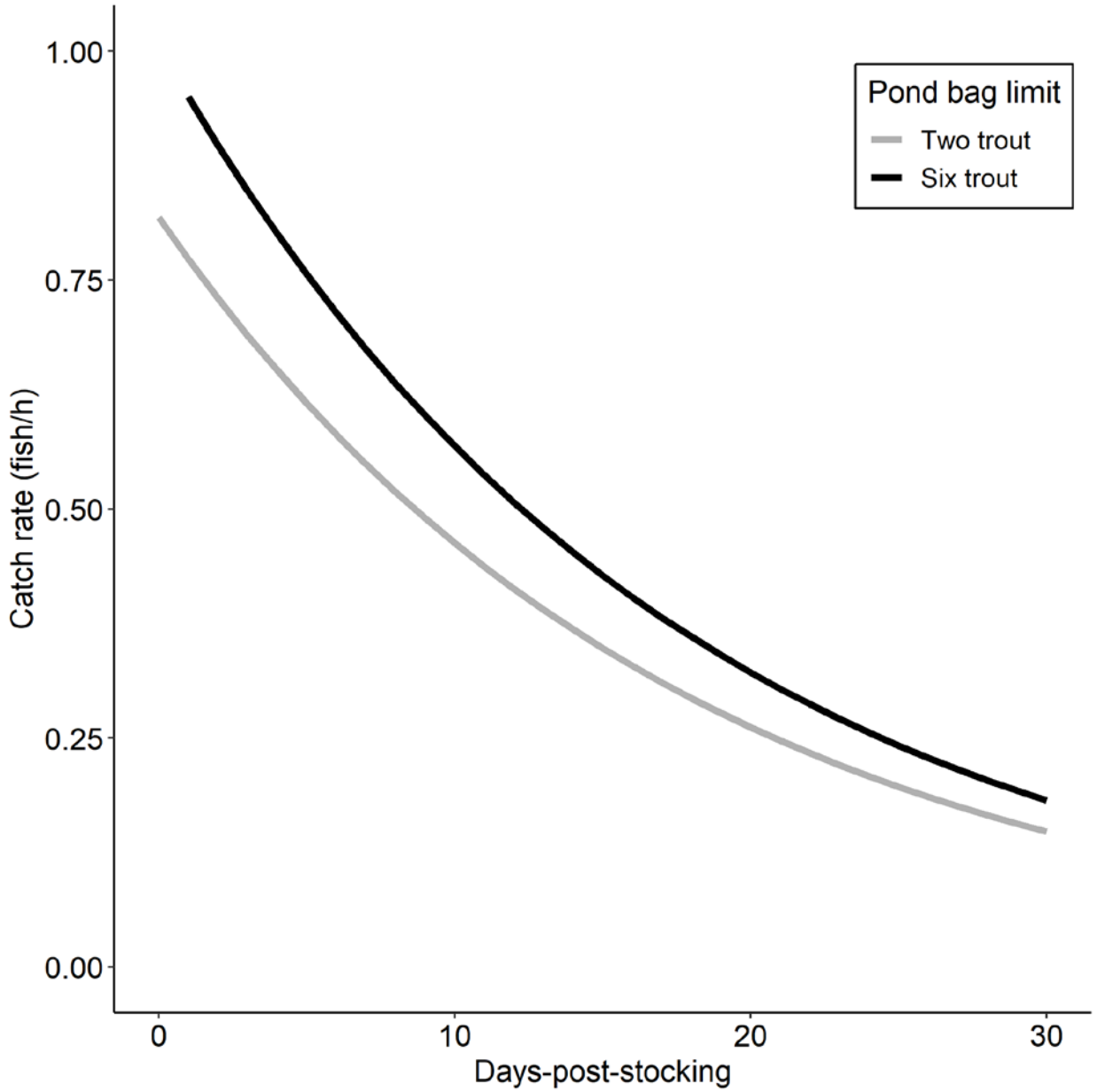

Figure 4. Model-predicted catch rates (fish/h) of Rainbow Trout over time at two- and six-trout limit ponds. The model is a generalized linear mixed effects model with a Poisson error distribution. Individual catch, offset by effort, is the dependent variable, while days-post-stocking (DPS), bag limit, and stocking density were predictor variables. Catch rates corresponding to zero DPS refer to catch rates measured on the same day as stocking.

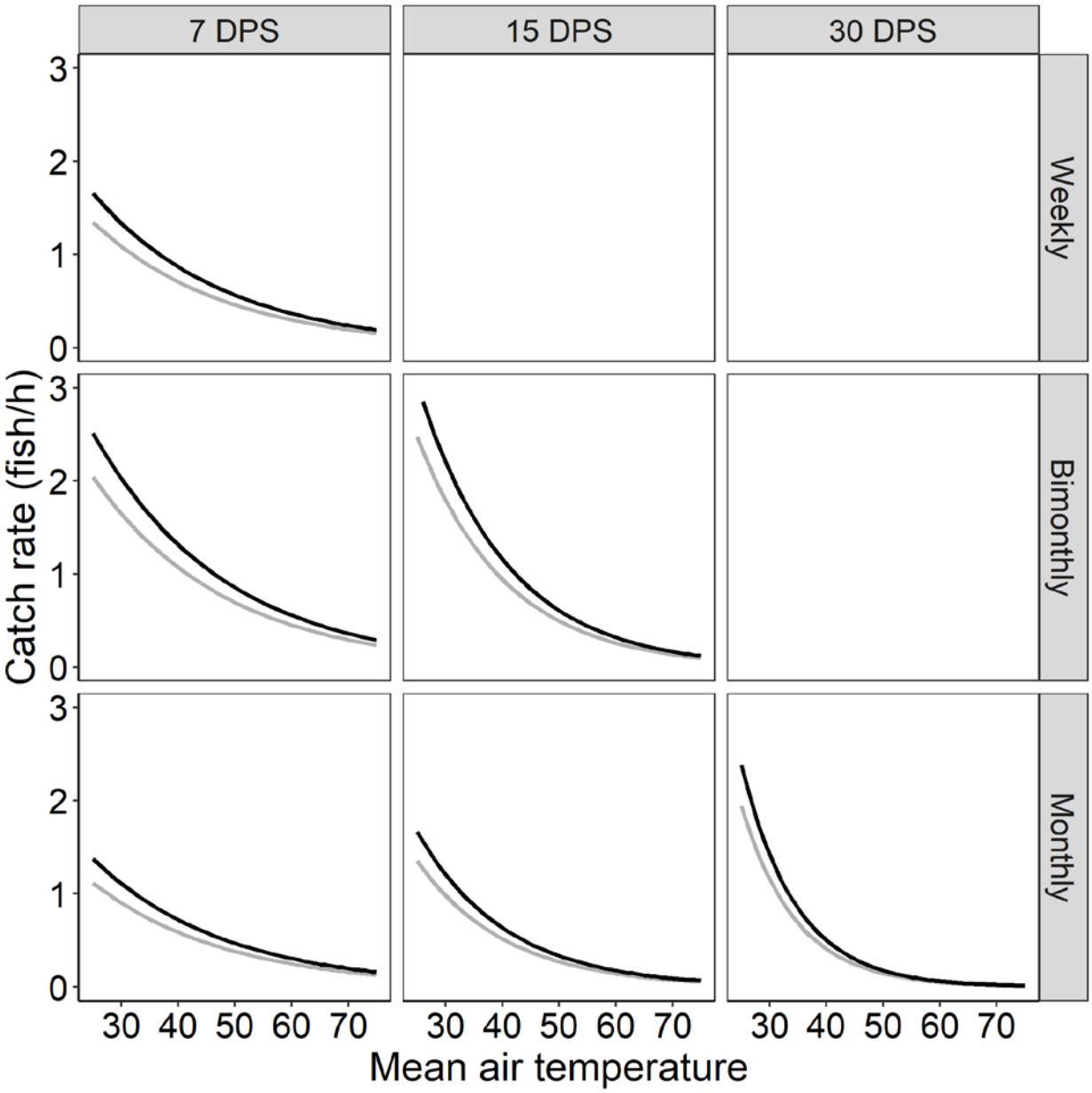

Figure 5. Model-predicted catch rates (fish/h) of Rainbow Trout at two- (black lines) and six-trout (grey lines) ponds as a function of mean air temperature surveyed at 7, 15, and 30 days-post-stocking (DPS) for weekly, bimonthly (twice monthly), and monthly stocked ponds.

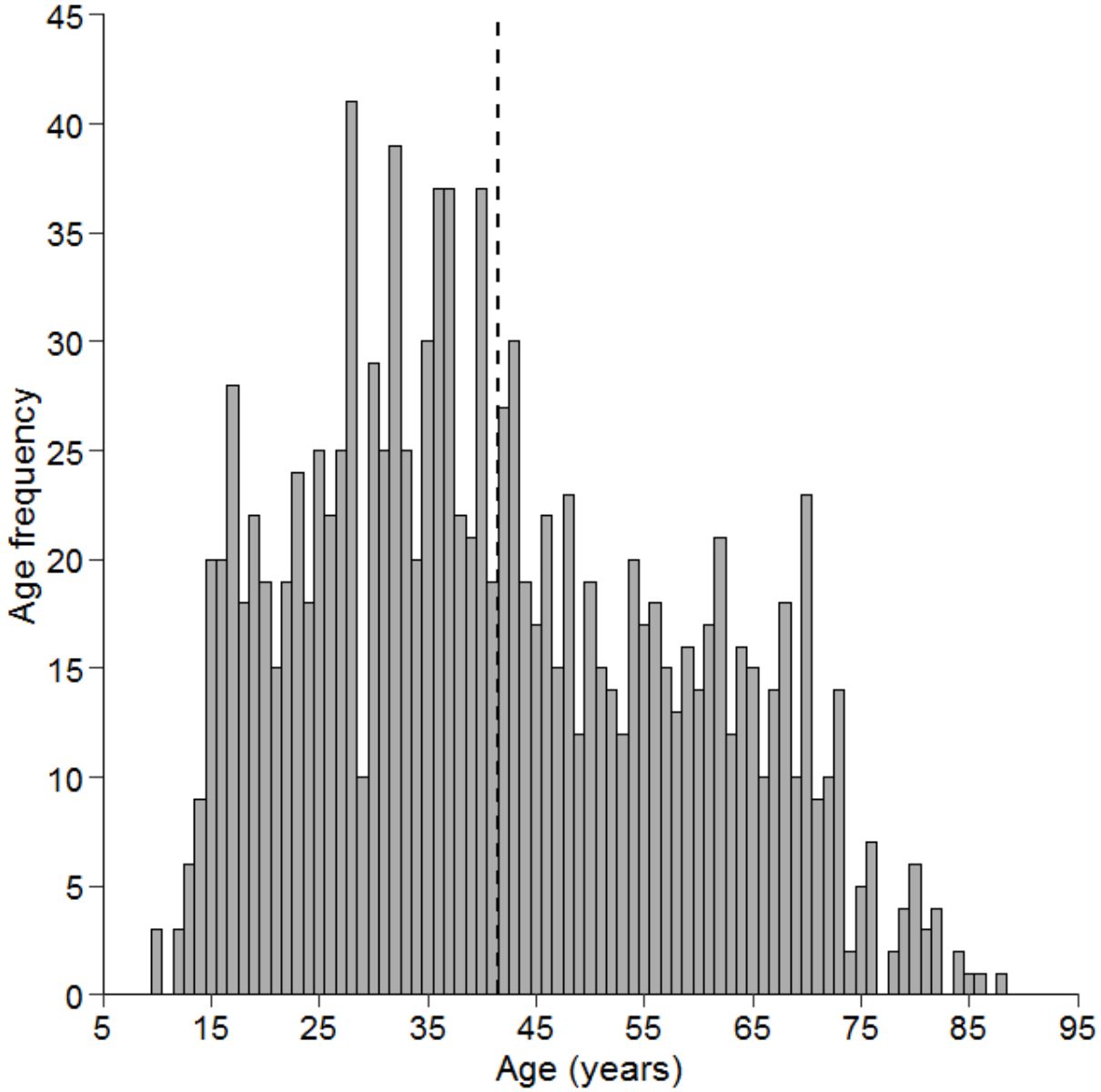

Figure 6. Age frequency distribution of interviewed anglers. The dashed line represents a mean age of 42 years.

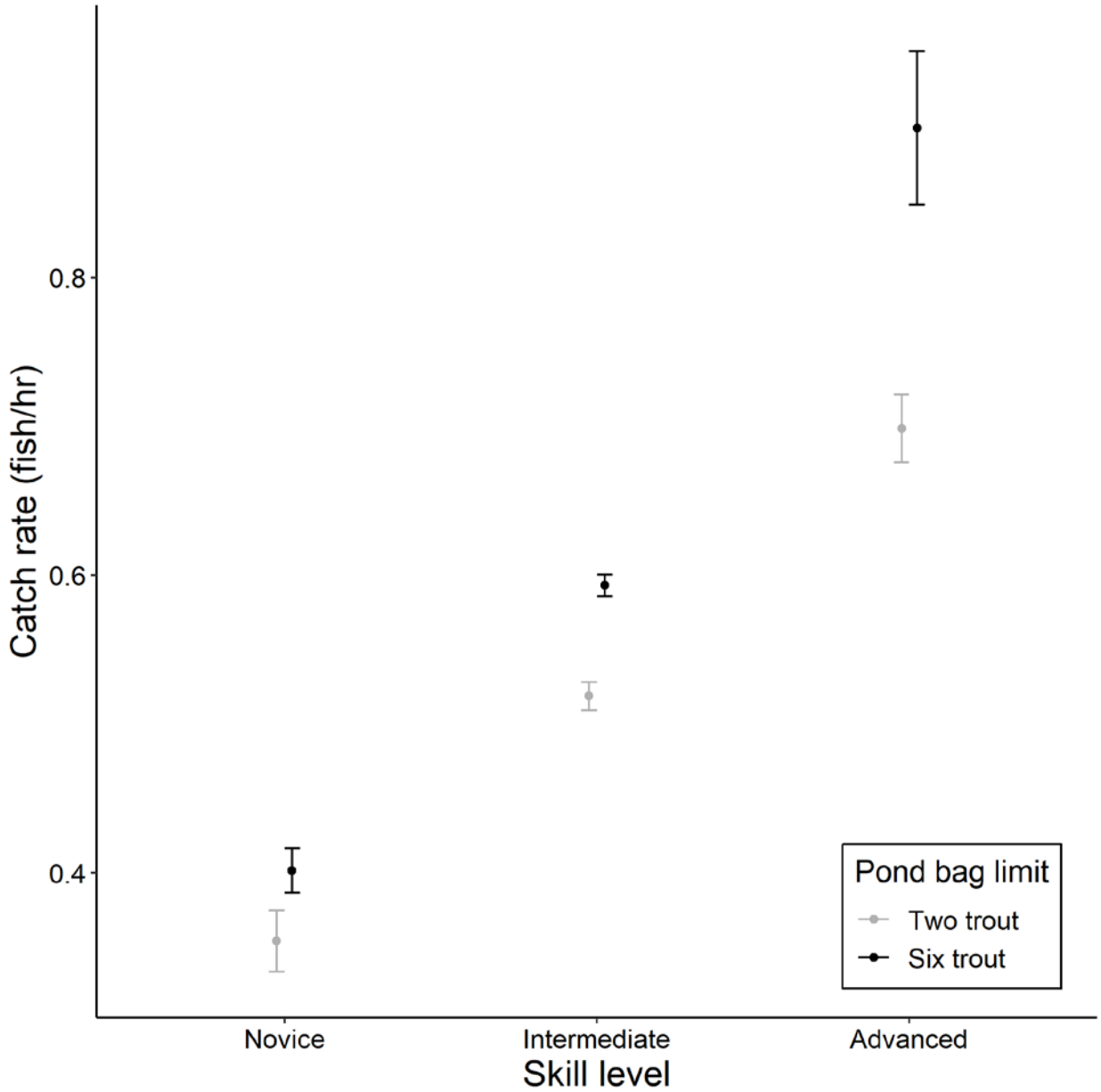

Figure 7. Catch rates (fish/h) of Rainbow Trout among angler-reported skill levels for interviewees at ponds with two- or six-trout bag limits.

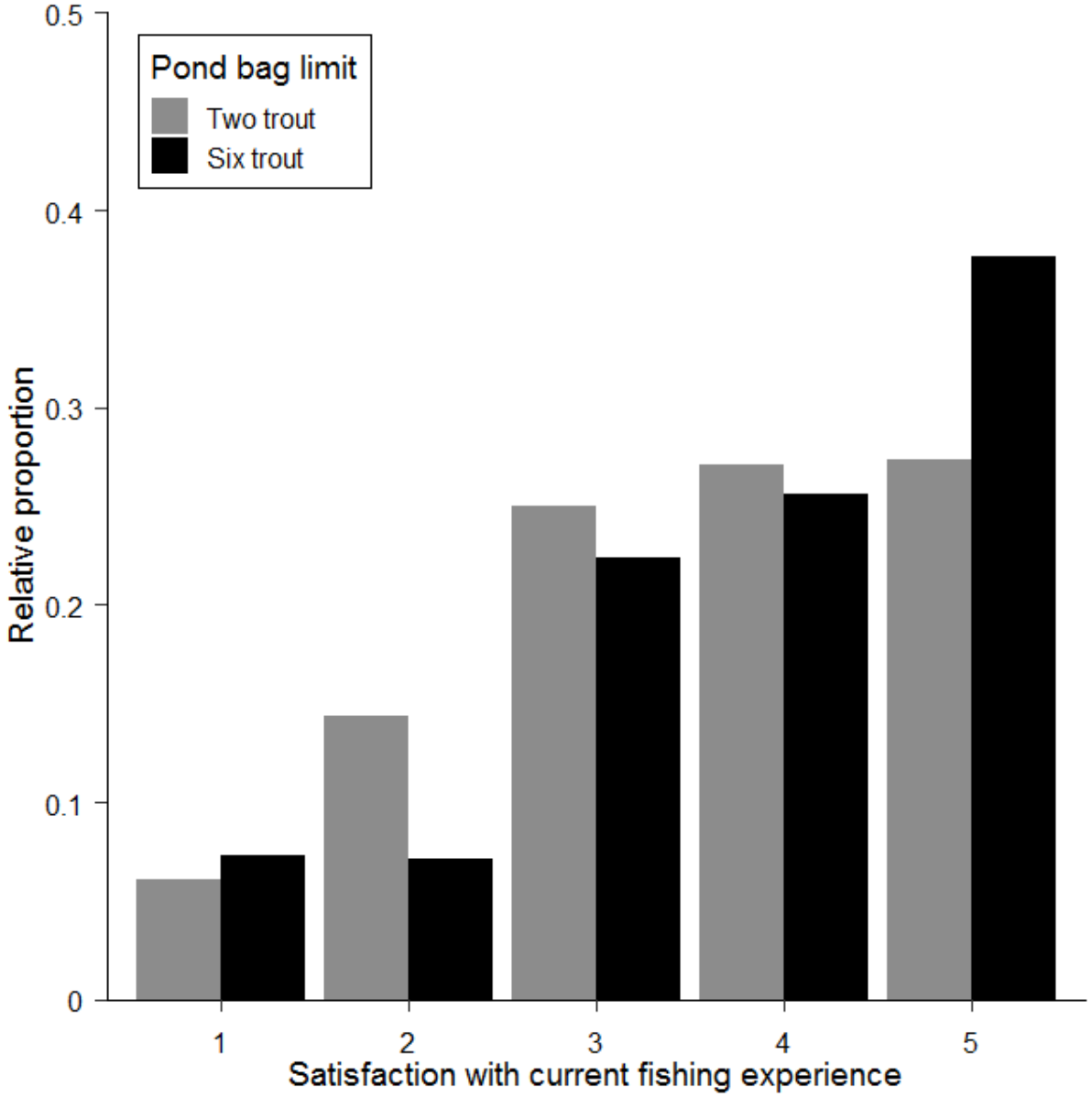

Figure 8. Anglers asked "How satisfied were they with their current fishing experience" after they completed their fishing trip. The scale corresponds to (1) "Very unsatisfied", (2) "Somewhat unsatisfied", (3) "Neutral", (4) "Somewhat satisfied", and (5) "Very satisfied". Anglers interviewed are separated into whether the pond where they were fishing had a two- or six-trout daily bag limit.

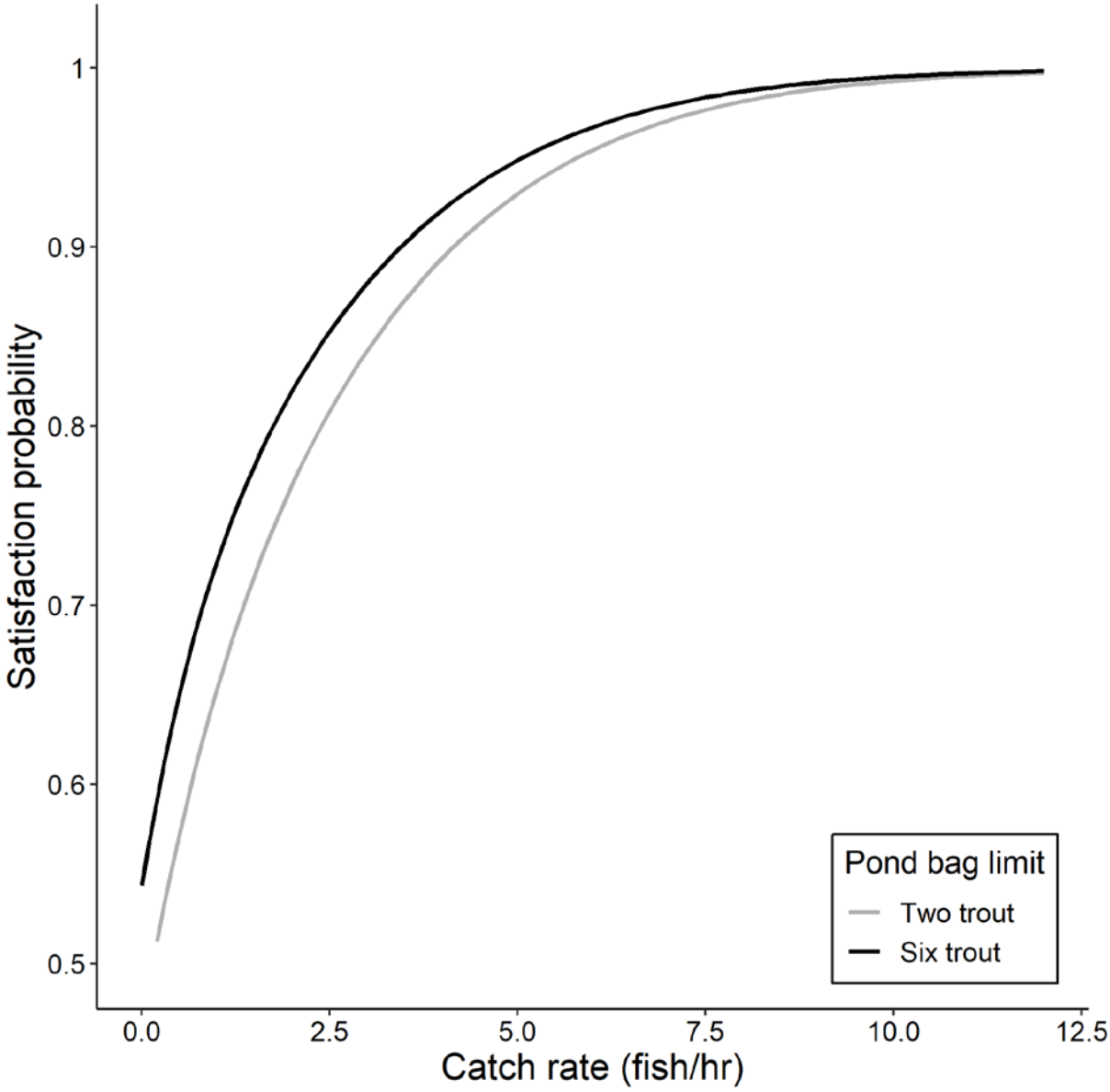

Figure 9. Model-predicted probabilities of angler satisfaction with their fishing experience over the observed range of catch rates of Rainbow Trout for two- and six- trout limit ponds.

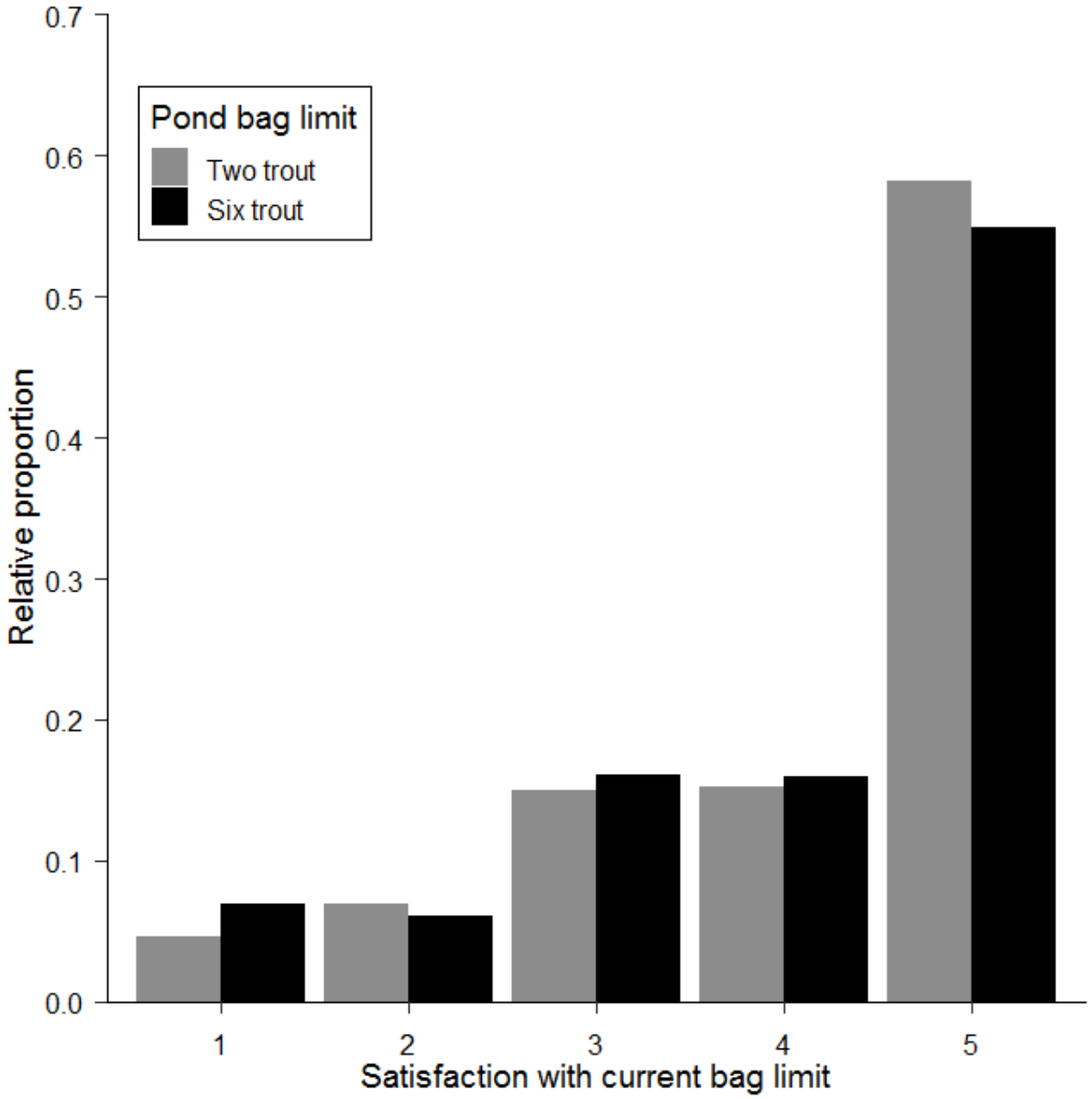

Figure 10. Anglers were asked “How satisfied were they with the bag limit at that pond?” after they completed their fishing trip. The scale corresponds to (1) “Very unsatisfied”, (2) “Somewhat unsatisfied”, (3) “Neutral”, (4) “Somewhat satisfied”, and (5) “Very satisfied”.

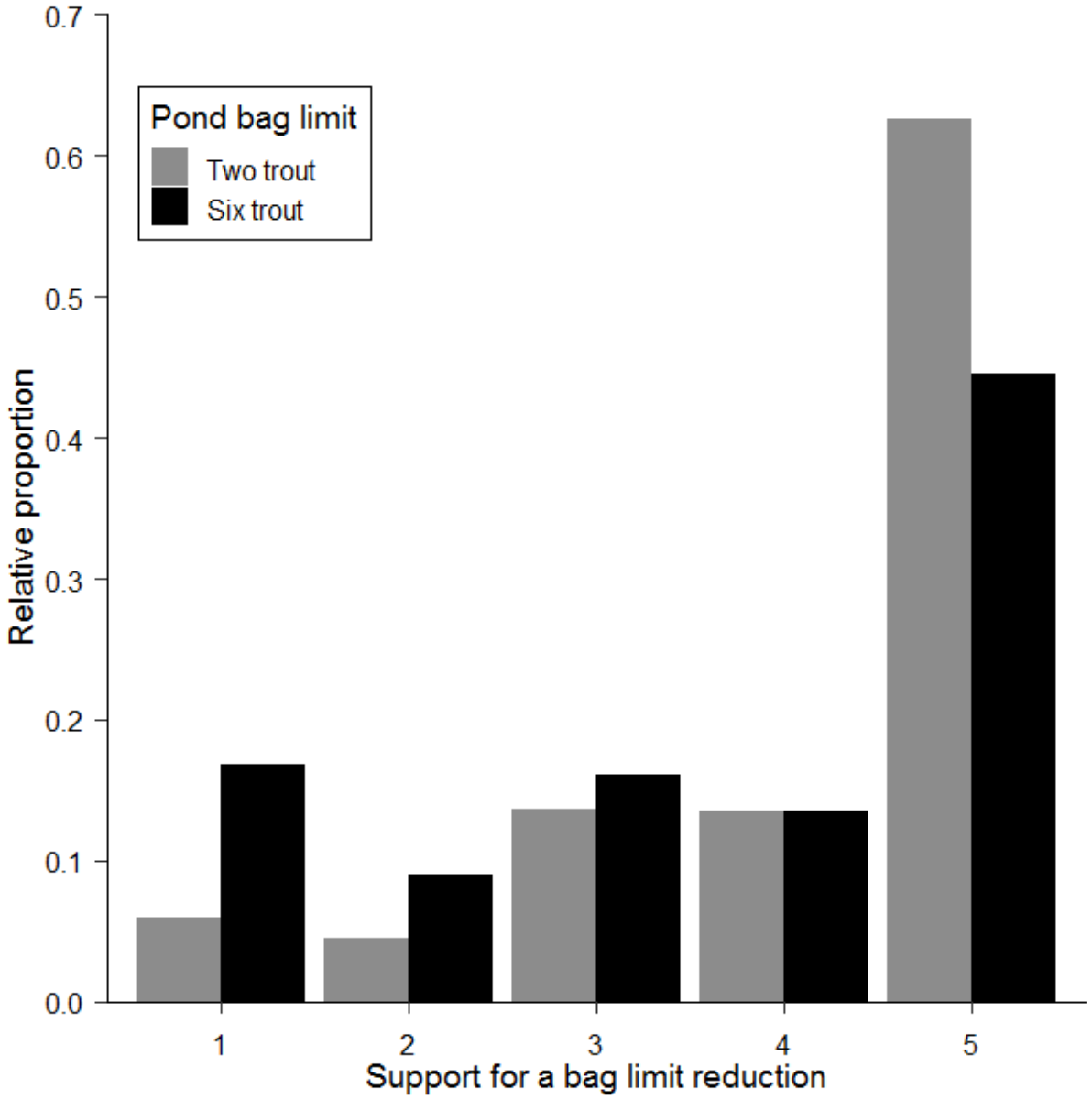

Figure 11. Anglers were asked "How likely would they be to support a bag limit change to six trout if doing so improved fishing". Respondents are grouped into whether they were fishing at a pond with a two- or six-trout bag limit.

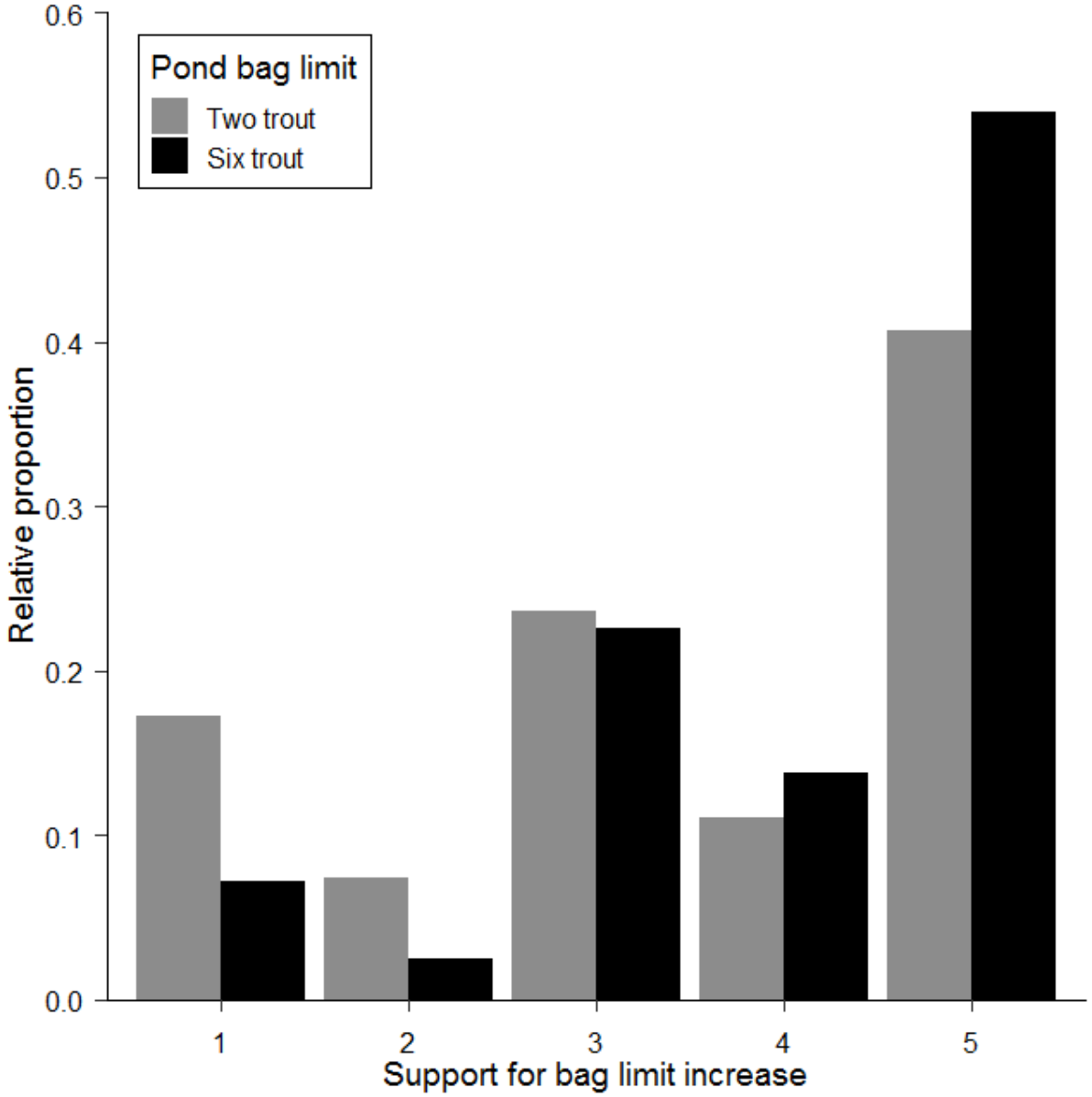

Figure 12. Anglers were asked “How likely would they be to support a bag limit change from two to six if no benefit was shown at the two-trout ponds.” Reponses are grouped into whether they were acquired at ponds with a two- or six-trout daily bag limit.

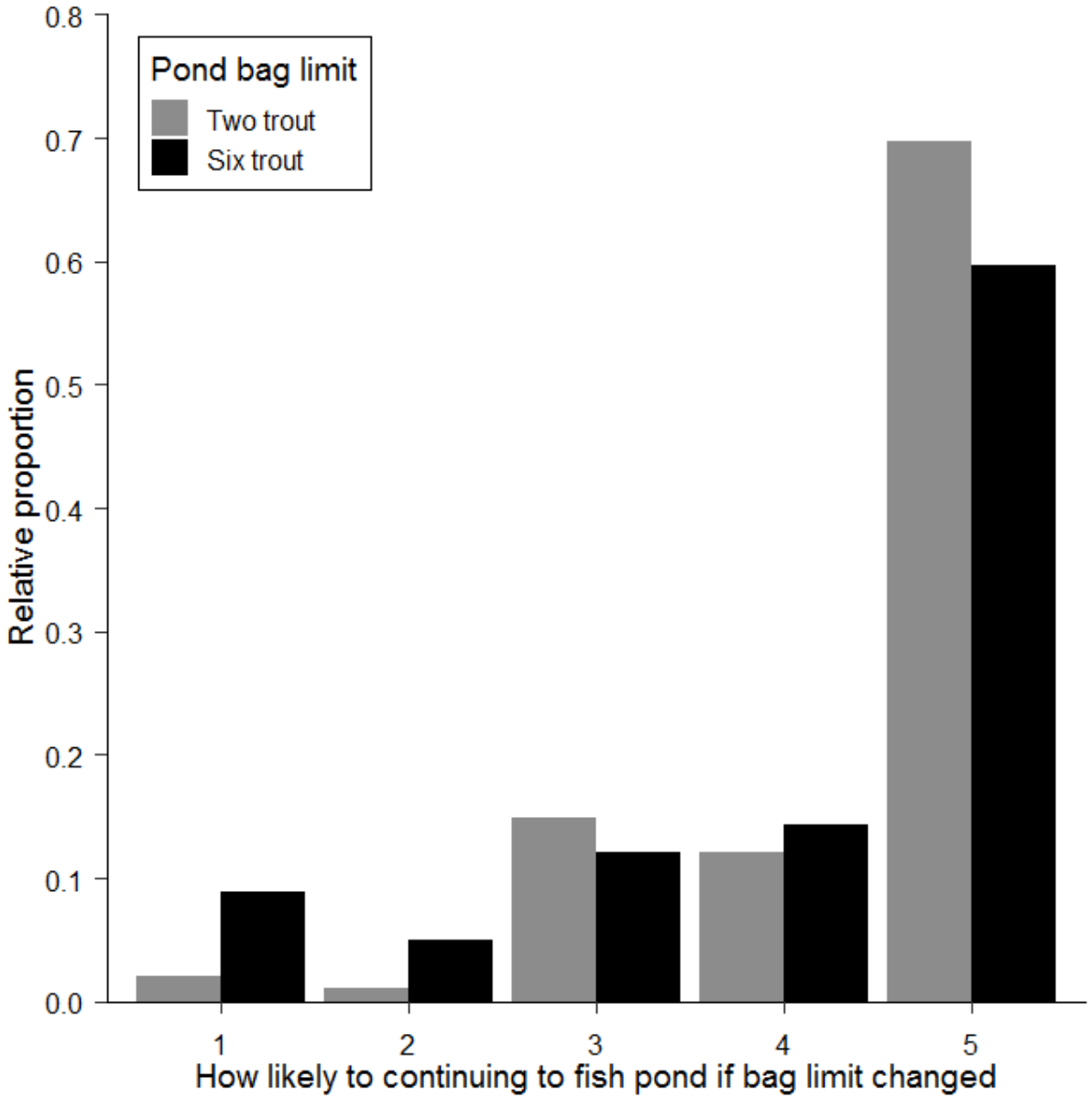

Figure 13. In order to quantify potential displacement, anglers were asked "How likely would they be to continue fishing the pond they were at if the bag limit changed." At ponds with a six-trout bag limit, this would mean a potential reduction to two trout. At ponds already with a two-trout limit, this would mean an increase from two to six.

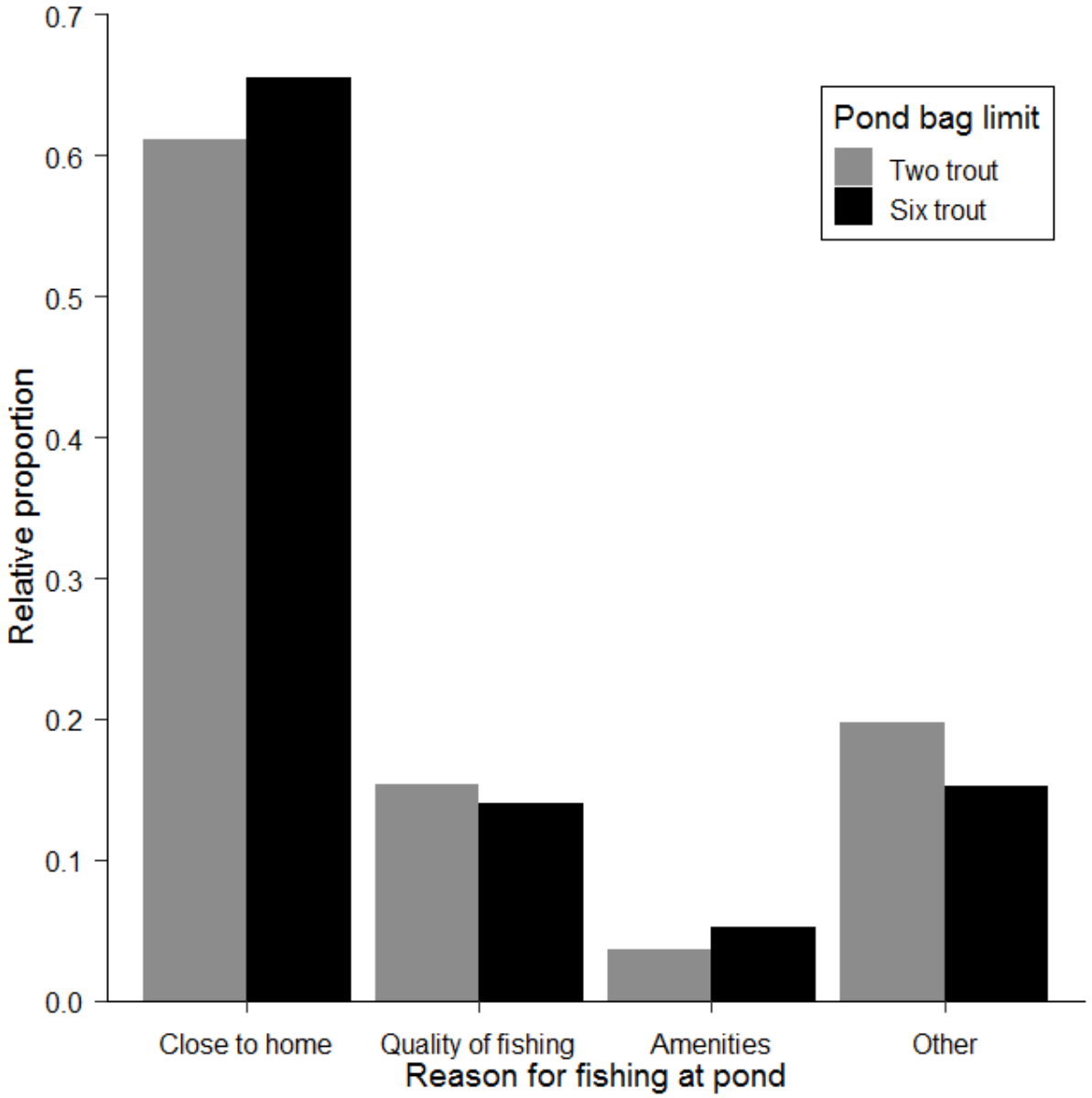

Figure 14. Anglers were asked to choose from a list of the reasons for fishing at that community pond. If they chose "Other," they were asked to identify what that reason was. These responses included that "it was kid/family friendly," "it was a new spot," "it was relaxing," "it was recently stocked/it was a food source," among others.

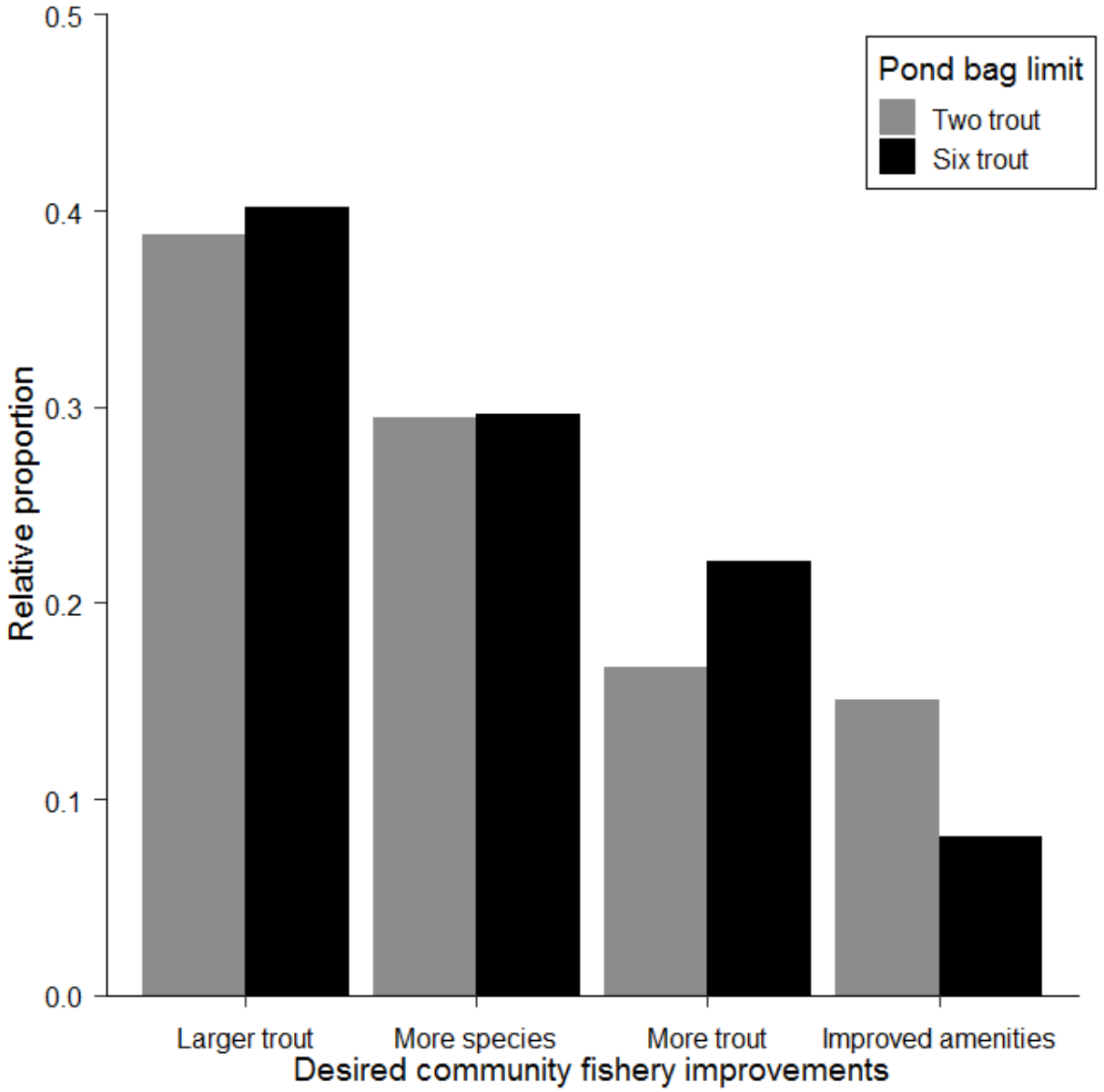

Figure 15. Anglers were asked what potential community fishery improvements they would most want. They were also given an "other" option and asked to identify what that improvement would be. The most numerous other improvements include weed/algae control, more enforcement patrols, and more access.

APPENDIX

A1. Creel questionnaire.

Water:	Date:	Trout reg: 2 or 6 (circle one)
Data collector:		
Weekend/Weekday (circle one)	Trip type: incomplete/complete (circle one)	
Fishing trip start time:	Fishing trip end time (if complete, current time if incomplete:	
What species are you fishing for today?		
How many trout did you keep today?	Other sp?	
How many trout did you release today?	Other sp?	
How many in fishing party?	If >1 how many are kids less than 14yr?	
Travel distance?		
How many days usually fished per year?		
How many days fished at ponds like this one?		
Angler skill level? Novice/Intermediate/Advanced		
What type of gear are you fishing with?		
Age:	(If they do not respond, estimate Senior, Adult, Juvenile)	Gender: (Should not need to ask this)
Ethnicity:		
Fishing license #:		

Idaho Fish and Game has been evaluating the harvest of hatchery trout in community ponds around the state. We have found that in many ponds, most stocked trout are harvested soon after stocking.

The Department is considering reducing the bag limit in some ponds with the hope that stocked trout will last longer and/or be available to more anglers. Additionally, this may produce higher catch rates for more days after stocking than our current bag limit produces. If we propose this change, we are interested in your opinions.

	Very unsatisfied	Somewhat unsatisfied	Neutral	Somewhat satisfied	Very satisfied
How satisfied are you with your current fishing experience in this pond?	1	2	3	4	5
How satisfied are you with the current two or six trout daily bag limit?	1	2	3	4	5
	Very unlikely	Somewhat unlikely	Neutral	Somewhat likely	Very likely
If it would improve fishing, how likely are you to support a two trout bag limit?	1	2	3	4	5
If a two trout bag limit doesn't improve fishing at ponds currently with that rule, how likely are you to support an increase to a six trout bag limit?	1	2	3	4	5
How likely are you to fish this pond in the future if the bag limit changes?	1	2	3	4	5

What is your primary motivation for fishing here (choose one)?

1) Quality of fishing
2) Close to home
3) Amenities
4) Other_____

We are always looking for ways to improve management of our fisheries. For community ponds such as this, which of the following changes would you most consider an improvement (choose one)?

1) More species: bluegill, bass, catfish, different spp of trout (other than RBT)
2) More trout stocked: more frequent or more numbers.
3) Larger trout stocked.
4) More or improved amenities at ponds: docks, trails, bathrooms, playgrounds, picnic tables, other?

Do you have any other suggestions for community pond improvements?

_____

The following questions are about <u>your</u> share of the amount of money spent for your trip.

Please estimate the amount you spent for your fishing trip in the following categories:

CATEGORY	Amount outside county	Amount in County
Food and beverages		
Fishing supplies, services, and equipment specifically for this trip		
Round-trip transportation		
Lodging		
Access Fees (boat launch, parking, private land, etc.)		

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