**Dataset Author**

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**Dataset Title**

Freshwater piscivore and prey fishes size relationships: an analysis of field-based diet studies

**Manuscript Citation**

Gaeta JW, Ahrenstorff TD, Diana JS, Fetzer WW, Jones TS, Lawson ZJ, et al. *In review*. Freshwater piscivore and prey fish size relationships: an analysis of field-based diet studies.

**Manuscript Abstract**

Body size governs predator-prey interactions, which in turn structure populations, communities, and food webs. However, information on piscivore-prey size relationships is limited. We quantified predator-prey total length and mass relationships for several freshwater piscivorous taxa: crappie (*Pomoxis* spp.), largemouth bass (*Micropterus salmoides*), muskellunge (*Esox masquinongy*), northern pike (*Esox lucius*), rock bass (*Ambloplites rupestris*), smallmouth bass (*Micropterus dolomieu*), and walleye (*Sander vitreus*). The range of prey total lengths increased with predator total length. The median and maximum ingested prey total length varied with predator taxon and length, but generally ranged from 10 – 20% and 32 – 46% of predator total length, respectively. Predators tended to consume larger fusiform prey than laterally compressed prey. With the exception of large Muskellunge, predators most commonly consumed prey between 16 and 73 mm. A sensitivity analysis indicated these trends can be very accurate at sample sizes greater than 1,000 diet items and fairly accurate at sample sizes greater than 100 (e.g., for a prey total length of 153 mm, we observed a deviation of <1mm (σ = ±<1.6 mm) given n = 1,000 and 1 mm (σ = ±<2 mm) given n = 100). However, sample sizes less than 50 should be evaluated with caution. Our findings support previous work suggesting that predator-prey interactions may not be governed solely by maximizing energy intake while minimizing handling time, but also driven by capture success. Furthermore, median log10 predator-prey body mass ratios ranged from 1.9 – 2.5, nearly 50% lower than values previously reported for freshwater fishes. Managers, researchers, and modelers could use our findings as a tool for numerous predator-prey evaluations from stocking size optimization to individual-based bioenergetics analyses identifying prey size structure. To this end, we have developed a web-based user interface to maximize the utility of our models that can be found at [*www.LakeEcologyLab.org/pred\_prey*](http://www.LakeEcologyLab.org/pred_prey).

**Methods**

See Gaeta et al. *in review* for detailed methods

**Variables**

* Year
* Lake
* Predator\_ID
* Predator\_species
  + BKC = Black crappie
  + LMB = Largemouth bass
  + MSK = Muskellunge
  + NOP = Northern pike
  + RKB = Rock bass
  + SMB = Smallmouth bass
  + WAE = walleye
  + WHC = White crappie
* Predator\_TL
  + TL = Total Length
  + units = mm
* Prey\_TL
  + TL = Total Length
  + units = mm
* Prey\_shape
  + - See Gaeta et al. *in review* Appendix S1 for body shape classification of prey species
  + fusiform
  + laterally\_compressed
  + unk = unknown prey shape