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March 1, 2020

NREM 585

Annotated Bibliography: Policy Brief

Iowa Code § 482.1-15. (2020). Commercial Fishing. Online. Accessed 28 February 2020.

The objectives are to define the authority of the Natural Resource Commission (NRC) over commercial fishing activities in Iowa, define terms, implement a licensing program for commercial anglers, and denote what activities are and are not permitted under law. Section 482.1.c authorizes the Director of the Natural Resources Commission to enter into contracts for the removal of "underused, undesirable, or injurious aquatic organisms. A license fee structure for commercial fishing is laid out. The types of fishing gear allowed, methods of take, and unlawful activities are all explicitly described in this chapter of the Iowa Code.

The definition of terms, and distinctions between similar terms (e.g., "commercial turtle harvester" and "commercial turtle helper") was particularly informative. The structure of fees were interesting, there is definitely a favoritism toward Iowa residents. Enforcement of many of these statutes is lacking, it is possible that Iowa DNR biologists tasked with monitoring harvest do not know all the restrictions and mandates put upon commercial fishers. The director of the NRC has the ability to authorize chemical, electric, and explosive means to capture fish, which would certainly draw criticism from the public. Violations of this chapter are classified as misdemeanors, and the threat of criminal punishment is likely an effective way of ensuring compliance.

Iowa Code § 571.82. (2020). Natural Resource Commission Chapter 82: Commercial Fishing. Online. Accessed 28 February 2020.

The objectives are to define and specify the process of selecting contractors to remove fish from inland Iowa waterways as well as the Mississippi and Missouri Rivers. This section of Iowa Code is structured by identifying the sequential process for competitive bidding, which is used to select commercial fishing contractors. There are protections for the state of Iowa to "select the bid believed to be the most advantageous to the state" as well as protections against potential fraud and conflicts of interest by elevating contract decisions for bids over $25,000 to the entire Natural Resource Commission. The distinction between inland waters regulation is left to Iowa alone, whereas border waters (Mississippi and Missouri Rivers) are more highly regulated but are not limited to short-term fishing contracts.

There are a few interesting distinctions between inland and border waters. Inland waters do not have any size restrictions, and permitted gears are specified in each contract and are therefore unique to each inland water body. Due to the interstate nature of the Missouri River and Mississippi River, individual contracts are not awarded and therefore more regulations are placed on who may fish the rivers and how they capture fish for removal. Inland waterbody

contracts specify that all individuals captured from species approved for harvest must be taken, but fewer fish species are allowed to be harvest inland. This source provides information about the critical distinction between inland waters of Iowa and border waters.

United States Code Title 16 Chapter 53 § 3371 – 3378. (2020). Control of Illegally Taken Fish and Wildlife. Online. Accessed 28 February 2020.

This section of federal code covers the control of illegally taken fish and wildlife, including definitions, prohibited acts, outlines of penalties and sanctions, authority for asset forfeiture, enforcement and administration, and exceptions to the code. This code adds another component to the penalties associated with transactions of species that have been taken illegally. Appropriations in the amount of $3 million per year for enforcement is specified. Due to the nature of crimes in this section, fees are relatively low for each illegal organism in possession, but total fees are capped at $10,000. However, civil penalty fees are only assessed after the person accused is given a hearing and right to appeal.

One simple sentence in this chapter of US Code has broad implications for my policy topic: “Nothing in this subsection preempts or supersedes the authority of a State to regulate wildlife species within that State.” Therefore, the US Government still leaves the fish and wildlife management to the states (mostly, exceptions exist) but regulates the interstate commerce of those species. The penalty for such offenses is high, civil asset forfeiture is no joke. The enforcement subsection is interesting in setting the authority to arrest persons without a warrant, setting the jurisdiction of such offenses in US District courts, and the authority to use funds obtained from penalties or asset forfeiture to reward informants and caretakers of organisms after they are confiscated.

Iowa Department of Natural Resources Contract Number 19CRDFBGSCHO-100(2). (2018). Between Iowa Department of Natural Resources and Greg A. Mohr: Five Island Lake (Palo Alto County). Personal communication.

This specific contract is for commercial harvest of three fish species in Five Island Lake (Palo Alto County, Iowa). Greg Mohr won the competitive bidding process for the sole rights to fish this lake with a bid of $8,499. The term of this contract was from January 1, 2019 to December 31, 2019. Specific restrictions on fish harvest revolve around limited species that are allowed to be harvested, time of day and time of year that commercial fishing activities may occur, and specific restrictions to prevent the spread of aquatic invasive species. In addition, the Iowa DNR specified in this contract that the contractor would be compensated for capturing fish that will not be sold, but tagged and released back into the lake, and any fish captured with tags present must be retrieved and returned to the Iowa DNR. Finally, the contract stipulates that the contractor must comply with all applicable federal requirements.

The Iowa DNR wants to protect fishery resources for recreation, and limits harvest to times of year when water temperatures are less than 70 degrees Fahrenheit to reduce stress on

other fish species. The contractors are not allowed to fish holidays or weekends, nor are they allowed to conduct work between a half-hour after sunset and a half-hour before sunrise. My personal experience with the harvesters is that they comply with all these restrictions, however, the aquatic invasive species and disposal of unmarketable fish is questionable. The biggest difference in this contract and others is the tagging assistance set by the Iowa DNR. In a way, the contractor could be paid twice for the same fish: once to tag and release, again to capture and sell. The Iowa DNR benefits by being able to calculate rough abundance estimates and set subsequent quotas for these undesirable fish species.

Lackmann, A. R., A. H. Andrews, M. G. Butler, E. S. Bielak-Lackmann, and M. E. Clark. 2019. Bigmouth Buffalo Ictiobus cyprinellus sets freshwater teleost record as improved age analysis reveals centenarian longevity. Communications Biology 2:14.

Lackmann et al. 2019 made some waves in the fisheries community when it was published, as it is rare for teleost (bony fish) species to reach 100 years of age or more. The authors used bomb radiocarbon dating to verify their age estimates and determined that some of the bigmouth buffalo individuals in their sample were born before the first nuclear bombs were tested and deployed during World War Two. The authors claim that habitat fragmentation via dam building in the Upper Missouri River has affected bigmouth buffalo reproduction in the last century. The paper also cites recreational harvest of bigmouth buffalo as a threat to their persistence as a species because night bowfishing is becoming a popular sport among anglers.

Bigmouth buffalo is the primary species sought by commercial fishers in the inland waters of Iowa, due to a higher market value compared to other fish. This resource claims that bowfishing will exacerbate the effects of habitat fragmentation and will further harm these populations. While bowfishing is gaining in popularity, I am skeptical that there will be enough pressure from bowfishing to affect the buffalo populations in Iowa. Further, commercial harvest of bigmouth buffalo has been going on in the inland and border waters Iowa for a hundred years or more, yet fish recruitment still occurs and the outfits catching these fish for profit haven't fished themselves out of a job yet. We have certainly observed some relatively old bigmouth buffalo from the Iowa lakes I study (30+ years) but none as old as this. Still, since bigmouth buffalo are native and overfishing could cause a population collapse, it is worth noting the dangers this source cautions against.

Colvin, M. E., C. L. Pierce, T. W. Stewart, and S. E. Grummer. 2012. Strategies to control a common carp population by pulsed commercial harvest. North American Journal of Fisheries Management 32:1251–1264.

Colvin et al. 2012 describe the negative ecosystem impacts of common carp and discusses general carp reduction strategies before identifying the study objectives: simulating much the minimum reductions must be to control nuisance species. The paper describes how one million kilograms of carp have been harvested from Clear Lake, Iowa in the past 70 years. An important distinction the authors make is that most commercial harvest in Iowa is limited to short

"pulses" where the commercial fishing operations work on one lake at a time for a week or two, then move on to another lake. Because of this, significant population reductions of non-native common carp (and hypothesized subsequent improvements to water quality) are hard to achieve. The authors use simulations to estimate effectiveness of three commercial harvest scenarios.

This paper highlights a common theme in the Iowa commercial fishing program: the amount of effort expended at any single lake is unlikely to cause permanent populations changes, and supplementing effort through market incentives may help achieve management goals. Adding incentives to harvest and setting quotas in the contracts were applied in Lost Island Lake, Iowa and the Iowa DNR were able to observe drastic reductions in carp populations there, followed by improvements to water quality. However, in that system they also installed fish barriers to prevent carp spawning and reproduction, plus stocking of predatory fish species to help combat any reproduction that still occurred. This paper was probably one of the first to suggest that obtaining initial biomass estimates to set harvest quotas of carp in Iowa would make reductions in biomass more effective.

Weber, M. J., M. J. Hennen, and Mi. L. Brown. 2011. Simulated Population Responses of Common Carp to Commercial Exploitation. North American Journal of Fisheries Management 31:269–279.

Weber et al. 2011 quantified the effects of commercial harvest of common carp on the many potential ways fish populations can respond to and compensate for harvest. Specifically, if fish are released from density dependence after harvest survivors may grow faster or have more successful reproduction and recruitment. Simulations showed that high harvest rates lead to smaller size structures if carp exhibit consistent recruitment, but if their recruitment is more cyclic the reductions in population are not as great. The authors also showed that the largest reductions in abundance occur at low exploitation rates, and the relative change in population at high exploitation rates has a smaller effect on abundance, and that the response was similar in scenarios when carp had consistent recruitment and cyclic recruitment.

This source somewhat contradicts the previous source by saying the greatest effects of exploitation occur at low harvest rates, and the proportion of change in abundance and fish size decreases as exploitation increases. Since the authors observed similar responses in three lakes, it is probable that the trends observed are applicable to carp populations in similar systems across the plains regions. It was important to note in the discussion that commercial harvest gear is size selective, and many smaller fish will escape exploitation and continue to grow and reproduce, limiting the effectiveness of harvest at all levels of exploitation. The simulation results showing that harvest beyond 40% has less benefits (from a population management and control standpoint) is an argument against the implementation of incentivized harvest contracts.