



# Weighing the Effects of Length Limits

*Biologists pay special attention to walleye on Devils Lake, Lake Sakakawea, the Garrison Reach of the Missouri River downstream of Garrison Dam, and Lake Oahe, annually assessing whether any of the common length limits would have a positive effect.*

*By Scott Gangl*

Every summer, armed with nets and other sampling gear, fisheries biologists navigate some of the state's popular fishing waters to assess the status and health of fish populations.

Once the data is summarized, analyzed and carefully considered, the information provides the basis for State Game and Fish Department management decisions. Such as, how many fish to stock or whether special regulations would enhance fish populations for anglers.

Select anglers routinely request special length regulations, like "minimum," "maximum," "one-over," or "slot" limits, with the expectation that protecting big fish or allowing small fish to grow will make the fishing better. While Department fisheries managers seriously consider these regulation requests, the data often doesn't support the perception, so implementing a regulation would not achieve the desired results.

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CRAIG BIRHLE

Biologists pay special attention to walleye on Devils Lake, Lake Sakakawea, the Garrison Reach of the Missouri River downstream of Garrison Dam, and Lake Oahe, annually assessing whether any of the common length limits would have a positive effect.

What follows is a summary of observations and conclusions on what effect new length regulations would have on those walleye populations.

## Minimum Length Limit

When a walleye population has few young fish due to poor reproductive or stocking success, but fish are growing well, a minimum length limit can help protect young fish to grow to a size that would provide more benefit to the anglers' creel. Of course, for any fishing regulation to be effective, angler harvest must have more of an effect on the population than other natural sources of mortality.

Lake Sakakawea's walleye population today meets two of the criteria for a minimum length limit – low natural mortality and good growth – but does not exhibit any signs of a population in need of a minimum length limit, such as low reproductive or stocking success, or high fishing mortality. In fact, natural and fishing mortality combined has been around 30 percent on Sakakawea in recent years, which is sustainable when compared to more heavily fished populations.

In addition, the combination of natural reproduction and good overall stocking success since 2010 has produced abundant young fish that are growing well and should reach a desirable size in another year or two.

The walleye population in the Garrison Reach and Lake Oahe is currently quite a bit different than Sakakawea's. Small fish are abundant following strong natural reproduction in 2009 and 2011. However, a major decline in forage abundance after the 2011 flood has decreased their growth rate. A lack of

food, teamed with a robust northern pike population, has also increased natural mortality.

Given the current situation, anglers are encouraged to harvest some smaller walleye to prevent fish from dying. Thus, a minimum length limit is not advisable on this population.

At Devils Lake, rising water levels have led to strong natural reproduction in recent years. Currently, there is no shortage of small fish in the population, and growth rates have decreased substantially since 2008. Since overall mortality rates are not excessive, it would be better to allow harvest of small walleye at Devils Lake rather than restrict it with a minimum length limit.

## One-Over

One of the more popular limit requests by anglers is a one-over, which is simply a maximum size limit that allows harvest of only one fish over a certain length. From a biological perspective, a maximum or one-over limit is only needed when reproduction is limited by the number of large brood fish, and the fish are vulnerable to high fishing mortality. The number of brood fish is seldom a limiting factor in most North Dakota waters, since most are maintained by stocking.

On Devils Lake, Lake Oahe and the Garrison Reach, natural reproduction has been very good in recent years, and stocking is effective for augmenting Sakakawea's population. Without this biological justification, the call for a one-over regulation is a social issue, where anglers are hoping the regulation would result in more large fish to catch. For this to happen, there has to be some evidence that harvest is having a major negative influence on the population's large fish. In other words, anglers have to consistently harvest multiple large fish per trip for a regulation limiting the harvest to one large fish per trip to be successful.



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Every spring anglers voice their concern that too many large walleye are harvested before, during and after the spawn in places like the Missouri River, or the coulees that flow into Devils Lake. This does occur at times when fish are most vulnerable, but is a small component of the total harvest over the course of the year.

According to Lake Oahe creel survey data from 2009, when walleye size structure was large and favored harvest of large fish, a one-over-20-inch limit would have reduced the total take by 2 percent that summer, even though 13 percent of the harvest was fish longer than 20 inches. This demonstrates how few anglers harvested more than one large fish per trip that summer.

Similarly, Game and Fish conducted a creel survey on the coulees flowing into Devils Lake in spring 2010 and found that most fish harvested were less than 20 inches, with an average length of 17.9 inches. Similar to Oahe in 2009, a one-over-20-inch regulation on Devils Lake would have reduced harvest by about 2 percent, a total of 170 fish, during that time.

Game and Fish tagging studies around the state indicate that 10-20 percent of released fish are caught more than once. So, a regulation requiring the mandatory release of 170 walleye in spring 2010 would have provided at most 35 fish to be recaptured and enjoyed later by anglers. When you consider that angling effort surpassed 1 million hours during the 2007-08 creel survey at Devils Lake, a regulation restricting spring harvest would not produce any real improvement to the fishing experience for the majority of anglers.

Even with a year-round regulation requiring release of all walleye longer than 20 inches, those fish would only be recaptured about once every 100 fishing trips. Some anglers will remain understandably passionate about this topic, but in

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MIKE ANDERSON



reality, restricting the harvest of large walleye would pay little dividend when it comes to improving fishing for the majority.

## Slot Limit

The third major regulation type, the slot limit, is likely the most misunderstood. Most anglers refer to a slot limit as a harvestable size range, say, from 14 to 20 inches. This harvest slot limit is a combination of the minimum and maximum size limits already discussed, and the same criteria would apply.

What fisheries biologists refer to as a slot limit, is a protected slot where anglers must release fish within the slot range and harvest is limited to smaller and larger fish. Since it would prohibit anglers from harvesting fish of sizes they most prefer, a protected slot limit would probably be the least popular of all. However, there could be some beneficial applications, so it should be considered like all the rest.

Imagine a walleye population that experiences consistent reproductive or stocking success, but has limited food resources so the abundant small fish don't grow very fast. Now throw in a lot of angling pressure, and the few fish that do reach harvestable size are quickly cropped off, with few fish making it to larger sizes.

A protected slot limit is designed to alleviate some of this and produce a more balanced size structure in a couple of ways. First, since anglers can't harvest mid-sized fish, they would be more likely to harvest smaller fish, in turn thinning the density of small fish and increasing their growth rate. Then, as those fish are growing faster, they are protected from harvest when mid-sized, allowing them to reach longer lengths than before.

Because Lake Sakakawea's walleye population is currently thriving, and has a very desirable size structure, a protected slot limit would not be warranted. On Lake Oahe and the Garrison Reach, the walleye population includes abundant small fish, and growth has slowed while mortality has increased, thus meeting three of four criteria for applying a slot limit. However, a more restrictive regulation would not address underlying forage problems impacting the fishery. Applying a slot limit now would needlessly restrict harvest, and possibly exacerbate problems by increasing the population density and competition for food at a time when forage is extremely limited.

At Devils Lake, the walleye population could possibly benefit from a protected slot limit due to its high abundance of small fish and slowing growth rate. Fishing effort can be high at times,



*Every summer fisheries biologists investigate some of the state's popular fishing waters to assess the status and health of fish populations. Some of this work goes on under the cover of darkness using electro-shocking equipment to stun fish that have moved into shallow water to feed.*

but harvest and mortality rates from fishing are not extreme, and natural mortality is likewise moderate. Applying a slot limit to this population is not biologically necessary, but Game and Fish biologists will be wrapping up a more in-depth study in June, looking at whether a slot limit would provide more large fish for anglers to catch.

The downside of a protected slot limit, however, is that anglers wouldn't be able to harvest the medium-sized fish that draw many to the lake every year – which to most anglers would be a very unfavorable regulation.

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