

# Evaluation of Unattended Yo-yos and Triggers

**Gary A. Tilyou**, Louisiana Department of Wildlife and Fisheries,  
P.O. Box 98000, Baton Rouge, LA 70898

**Charles E. Hoenke**, Louisiana Department of Wildlife and  
Fisheries, P.O. Box 915, Minden, LA 71055

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*Abstract:* The establishment of black bass (*Micropterus* sp.) size restrictions on some Louisiana lakes prompted a study to determine the catch and mortality rates of unattended yo-yos and triggers. From 15 November 1991 to 11 March 1992 gears were fished in close proximity in 5 impoundments a total of 825 nights per gear. The catch rate for all species was 0.168 fish/yo-yo night and 0.080 fish/trigger night. Largemouth bass (*M. salmoides*) catch rates were 0.005 fish/yo-yo night and 0.002 fish/trigger night. Mortality of all fish caught on unattended yo-yos and unattended triggers was 61% and 7%, respectively. Four largemouth bass were caught on unattended yo-yos; all died. Two were caught on unattended triggers; both survived. The results of this study indicate that there is no biological reason to place restrictions on unattended yo-yos or unattended triggers.

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The Louisiana Department of Wildlife and Fisheries approved regulations in 1991 that placed length restrictions on black bass in 11 Louisiana water bodies. The Department decided that it would be necessary to evaluate gear types that can be set by a fisherman and left to fish without constant assistance. Yo-yos, or auto-fishers, and triggers were the first such devices to be studied. Yo-yos are spring loaded, automatic hook-and-line, reel fishing devices. Yo-yos are common in Louisiana and have been used for many years. Triggers are a variation of the yo-yo in that they do not have the reel part of a yo-yo but do have a spring for setting the hook. Triggers are relatively new to Louisiana and are seldom seen on water bodies, but would probably be fished using the same methods as for yo-yos. Fishermen usually attach yo-yos to branches and place the baited hooks at various water depths. Yo-yos are commonly fished at night during the months of November-March with crappie being the target species. They are usually set at sundown and then either checked every hour or two or left and checked in the morning. Small fish captured on yo-yos are often lifted out of the water, while triggers are designed to leave the fish in the water. A single fisherman may use 30-40 devices at a time and 2 fishermen together may use 85-100.

Very few catch statistics are available on yo-yos, and no literature has been

found on triggers. A study by Davidson et al. (1967) resulted in identifying a catch rate of 0.026 fish/yo-yo hour. Out of 1,483 fish captured, 63 were largemouth bass. Schlagenhaft and Webb (1988) working in Texas showed a catch rate for attended yo-yos of 0.12 fish per hour and a catch rate of 0.030 fish per hour for unattended yo-yos. Five of 138 fish captured on unattended yo-yos were largemouth bass. Fish in their study had a total mortality of 85% when caught on unattended yo-yos.

These 2 studies indicate that largemouth bass are taken in small numbers by yo-yo devices and that fish captured often die because they are not quickly released. State regulations require that largemouth bass that do not meet length requirements must be released regardless of their condition or how they are caught. The primary objective of this study was to determine the catch and mortality rates of largemouth bass caught on unattended yo-yos and triggers. A secondary objective was to estimate the number of yo-yos on a water body.

## Methods

Five Louisiana water bodies throughout the state were chosen for this project. Lakes Bistineau (7,000 ha) and Saline (3,400 ha) have abundant standing timber and receive high to moderate yo-yo fishing pressure during November to April. Lake Bruin (1,200 ha) and False River (1,300 ha) are inactive oxbows of the Mississippi River. Their central channels are 9.2–13.7 m deep and their shorelines are almost totally developed with houses and piers. Yo-yos are primarily fished from piers and in the flats at the ends of the lakes. Lake Bartholomew (300 ha), is an inactive oxbow of Bayou Bartholomew and is studded with standing timber.

From 15 November 1991 to 11 March 1992, Department personnel fished yo-yos and triggers unattended by setting them within 1 hour of sunset and retrieving them within 1 hour of sunrise. The yo-yos were not disturbed by Department personnel between these times. Each lake was sampled once a month for 4 consecutive months from November–March. Each sample consisted of 25 yo-yos and 25 triggers. Yo-yos and triggers were fished in close proximity to allow comparison of catch statistics. They were either suspended from tree branches or from piers depending on the characteristics of the lake. Attempts were made to target crappie (*Pomoxis* spp.) when setting the devices, as this is the genus most likely targeted by fishermen. No. 2 hooks were baited with live minnows and fished at a depth at or near that of structural changes (e.g., limbs and logs).

Data recorded included date, gear, time set, time retrieved, condition of device when retrieved (undisturbed, bait missing and untripped, tripped, caught and stolen), species caught, weight (g), length (mm), and observed condition of fish (healthy = expected to survive if released, moribund = alive but not expected to survive if released, or dead).

Catch rates were computed as both fish/gear hour and fish/gear night. The first statistic was calculated to compare yo-yo catch results of this project to pass studies. We believe that fish/gear night may be a more meaningful statistic. The actual time a device is fishing is usually unknown as many are tripped when checked and some have caught fish. All catch rates were calculated by first obtaining the catch rate per

sample per night per species. Further analyses, such as overall catch rates, were then calculated using the initial catch rates. Comparisons of catch and mortality rates between gears were made using the SAS procedure *t*-test (SAS 1988).

A second objective of this project was to estimate the number of yo-yos that were present on a water body during February or March, the months of perceived maximum yo-yo use. To accomplish this task, a 1-day count of yo-yos and triggers was made on each study lake. Biologists either estimated the acreage where yo-yos were being used by the public and made a daytime count on 5%–34% of the total acreage or made a 100% count.

## Results

Total sampling effort consisted of 825 yo-yo nights and 825 trigger nights. Study biologists judged 41% of all yo-yos and 48% of all triggers were undisturbed (Table 1). Catch rates were significantly different for yo-yos and triggers ( $P < 0.01$ ). Yo-yos caught 140 fish and triggers caught 68 fish, resulting in overall catch rates of 0.168 fish/yo-yo night and 0.080 fish/trigger night (Table 2). Crappie had the highest yo-yo catch rate (0.052 fish/yo-yo night) followed by yellow bullhead (*Ictalurus natalis*) with 0.045 fish/yo-yo night. Only 4 largemouth bass were caught in the entire project on yo-yos, resulting in a catch rate of 0.005 fish/yo-yo night. The lake with the highest catch rate of largemouth bass was Lake Bartholomew (0.020 fish/yo-yo night). Yellow bullhead had the highest trigger catch rate (0.024 fish/trigger night). Two largemouth bass were caught on triggers (0.002 fish/trigger night).

Yo-yos had a total hourly catch rate of 0.011 fish/yo-yo hour and triggers caught 0.005 fish/trigger hour. The largemouth bass and crappie catch rates were 0.0003 and 0.0036 fish/yo-yo hour, respectively. The trigger catch rates were 0.0002 largemouth bass/trigger hour and 0.0012 crappie/trigger hour.

Fish condition was significantly different between gears ( $P < 0.01$ ). Dead or moribund fish made up 61% of the total catch on yo-yos and 7% on triggers (Table 2). All 4 of the largemouth bass caught on yo-yos were dead. The total lengths of these bass were 297, 374, 423, and 463 mm. Both of the largemouth bass caught on triggers (306 and 315 mm TL) survived. The percentage of crappie recorded as healthy was 9% for yo-yos and 100% for triggers.

The number of yo-yos on a water body ranged from 11,000 on Lake Bistineau to 1,000 on Saline Lake. The highest overall density, 7.7/ha, was observed on Lake Bartholomew. Yo-yos were usually found in concentrations, with as many as 4 yo-yos on a single tree. Many of the yo-yos were tripped and unbaited; some yo-yos were rusted. All of the lakes appeared to have yo-yos that were left out year around. The biologist conducting the study on Lake Bistineau estimated that 75% of the observed yo-yos were not being used.

## Discussion

Creel limits and length restrictions are 2 regulations in Louisiana that require fishermen using unattended gears to release fish. Louisiana has a statewide creel limit

**Table 1.** Percent occurrence of various gear observations in 1991–1992 yo-yo project.

Gear observation	Lake												Total	
	Bartholomew		Bruin		Bistineau		Black/Clear		False River		Total			
	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers		
Undisturbed	32	29	22	32	60	71	9	16	56	57	41	48		
Undisturbed—bait missing	20	33	14	24	6	9	46	34	2	3	13	18		
Tripped—no catch	23	31	35	29	24	14	23	42	35	35	28	26		
Caught fish	24	7	28	15	10	6	20	8	5	4	17	8		
Stolen	1	0	1	1	0	<1	2	0	1	1	1	<1		

**Table 2.** Number, mortality, average length and catch rates by species, 1991–1992.

Species	Number caught		Percent mortality		Average total length (mm)		Gear Catch/night	
	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers	Yo-yo	Triggers
	Largemouth bass	4	2	100	0	389	310	0.005
Spotted bass	1	0	100	0	397		0.001	0.000
Yellow bass	9	5	89	60	255	274	0.011	0.006
Hybrid striped bass	1	0	100		443		0.001	0.000
Chain pickerel	0	2		50		494	0.000	0.002
Crappie	43	15	91	0	281	289	0.052	0.018
Bluegill	1	0	100		185		0.001	0.000
Warmouth	5	2	60	0	183	220	0.006	0.002
Carp	2	0	50		336		0.002	0.000
Freshwater drum	1	0	0		341		0.001	0.000
Yellow bullhead	37	20	51	0	310	320	0.045	0.024
Black bullhead	1	0	0		341		0.001	0.000
Channel catfish	29	14	17	0	474	495	0.035	0.017
Blue catfish	0	1		0		294	0.000	0.001
Bowfin	1	0	100		616		0.001	0.000
Spotted gar	5	7	80	14	581	533	0.006	0.008
Total	140	68	61	7			0.168	0.080

of 10 black bass and 50 crappie per person per day. This study indicates that on the lake with the best catch rate of black bass, 2 fishermen would have to use 1,000 unattended yo-yos to catch their limit of black bass and 714 unattended yo-yos to catch 100 crappie. It would take about double the number of triggers to catch limits of these species. The results of this study strongly indicate that fishermen using unattended yo-yos or unattended triggers will not be exceeding the creel limits for these 2 species.

Louisiana has 2 black bass slot limits, a 356–432 mm TL slot on 7 lakes and a 381–483 mm TL slot on 2 lakes. Additionally, 2 lakes have a 356-mm TL minimum length regulation for black bass. Some of the black bass caught in our study would have been protected by size regulations and, legally, should have been immediately released. Our results confirm that fishermen using unattended yo-yos, and to a lesser extent unattended triggers, will catch black bass which will die before they can be released.

This brings up the question of whether or not the mortality of bass in restricted length groups is acceptable. Fishery managers accept some degree of mortality whenever they impose size restrictions. Hooking mortality will always exist and certain methods of fishing have been shown to have higher hooking mortality than others. From a biological standpoint, whether or not to allow a certain fishing gear, method or bait should depend on the percentage of total mortality associated to that gear, more specifically, the mortality to fish within the protected size restriction. Although fishing pressure from yo-yos may appear to be high to those viewing them on some water bodies, most observed yo-yos are not being fished. Additionally, yo-yo fishing is seasonal. For these reasons, we do not believe that yo-yo fishing pressure is high. A moderate degree of pressure, coupled with very low catch rates, indicates to the Department that very few black bass within restricted length groups are taken by unattended yo-yos or unattended triggers.

Unattended yo-yos and unattended triggers have several traits that have been regulated for non-biological reasons. Some of the non-biological justifications for regulations include the inconsistency of allowing a gear that does not allow catch and release in water bodies with length restrictions, possible safety hazards associated with large numbers of these gears hanging from trees, the aesthetic problems of dead fish or skeletons hanging from tree branches, and the practice by fishermen of leaving these gears to establish 'territory' on public water bodies. Common non-biological regulations include attendance laws, limits on the number of yo-yos, and complete prohibitions. Biologically, however, the results of this study indicate that neither unattended yo-yos nor unattended triggers need additional restriction.

## Literature Cited

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