ANNUAL PERFORMANCE REPORT

FRESHWATER SPORT FISH COMMUNITY ASSESSMENTS

Project Title	:	Freshwater Sport Fish Community Assessments in Puerto Rico Reservoirs and Lagoons.
Project Number	:	F-52.5
State	:	Puerto Rico
Period Covered	:	January 1, 2010 to December 31, 2010

Fish community assessment in selected reservoirs

Objective 1: To derive indices of sport fish populations and community well being in selected Puerto Rico reservoirs (Toa Vaca, Loiza, Carite, Cidra, Caonillas and Dos Bocas).

Remarks: Six reservoirs were monitored twice during the first semester (January-June) and second semester (July-December) including Toa Vaca (321 ha), Loiza (388 ha), Carite (133 ha), Cidra (170.8 ha), Caonillas (280 ha) and Dos Bocas (254 ha). These reservoirs are of high priority for sport fish management, according to the Puerto Rico Reservoir Fisheries Management Manual, and are not currently covered by DNER management officials. However, they are primarily used to supply water to the nearby communities, and for that reason the water level fluctuates, which can affect fish spawning and hence recruitment. The fish community assessments provide us with the data required to determine if these reservoirs are in need of active management as a result of the water level fluctuations, fishing intensity or other causes.

During the past year, we also performed some broodstock capture as requested by Maricao Fish Hatchery biologists (Project F-35). Also, we collaborated in electrofishing with Cerrillos and La Plata personnel because they had problems with their electrofishing boats.

Bass tournaments

Objectives 2: To describe the competitive fishery in selected reservoirs (Toa Vaca, Loiza, Carite, Cidra, Caonillas and Dos Bocas).

Remarks: Tournament officials from the reservoirs monitored were contacted via telephone by project personnel to obtain the information necessary to calculate the Effort, CPUE, # of tournaments, # of anglers, largemouth bass maximum weight, and successful anglers (%).

Table 1. Tournament data reported in reservoirs monitored during 2010.

Reservoir	# events reported	Effort (a/h)	Average anglers per event	Successful Anglers (%)	CPUE LMB	CPUE PKB	Average # LMB per event	LMB Max. weight (kg)
Toa Vaca	5	879	18	92	0.21	-	37	1.86
Loiza	7	2710	24	34	0.00	0.14	0	0.0
Caonillas	7	1850	21	28	0.01	0.13	2	2.72
Dos Bocas	4	780	19	8	0.02	0.02	3	0.94
Cidra	†	†	†	†	†	†	†	†

† Data was not provided.

Loiza and Caonillas were the reservoirs with the greatest tournament activity (7). Dos Bocas was the reservoir with the least tournament activity. Reservoirs with the greatest Effort (measured in angler-hours) were Loiza (2,710 a/h) and Caonillas (1,850 a/h). Dos Bocas was the one with the lowest tournament effort (780 a/h). Loiza was the reservoir with greatest participation (24 anglers per event) but Toa Vaca had the greatest % of successful anglers (92%). Also, Toa Vaca had the greatest LMB CPUE (0.21). Loiza was the only reservoir where no largemouth bass were caught during fish tournaments. However, PKB (peacock bass) CPUE (0.14) was greatest.

Data analysis and report preparation

Objective 2: To analyze data for annual and final reports.

Remarks: Six reservoirs were monitored between January to June 2010 (Semester 1 = S1) and again from July to December 2010 (Semester 2 = S2).

TOA VACA

The 2010 electrofishing capture at Toa Vaca reservoir was represented by nine species (Table 2). Threadfin shad (*Dorosoma petenense*) and mosquito fish (*Gambusia sp*.) were found but they have not been included in the species composition analysis, since they are not considered target species.

Table 2. Target species present in electrofishing samples at Toa Vaca reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition S1 2010	% Composition S2 2010	% Average Composition
armored catfish	1 (1)	2 (4)	1.5
blue tilapia	3 (6)	0	1.5
channel catfish	1 (1)	0	0.5
largemouth bass	38 (69)	20 (39)	29.0
mozambique tilapia	3 (6)	9 (17)	6.0
redbreast tilapia	28 (51)	19 (36)	23.5
redear sunfish	26 (46)	50 (98)	38.0
Total	100 (180)	100 (194)	100

In Toa Vaca, the largemouth bass, one of our target fish, showed a relative abundance of 69 individuals (38%) for S1 (four electrofishing stations only), and 39 individuals (20%) for S2. The dominant species was redear sunfish *Lepomis microlophus* followed by largemouth bass *Micropterus salmoides*. The peacock bass was not present in this reservoir, which was among the reservoirs sampled with lowest fish diversity.

Total Catch per Unit of Effort (CPUE fish/hour), LMB (largemouth bass) CPUE and LMB Relative Weight (Wr) at Toa Vaca reservoir for S1 and S2 2010 is presented in Table 3.

Table 3. Total CPUE, LMB CPUE and LMB Condition Factor for Toa Vaca reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	180	*103.5	112
S2 2010	194	39	104

* Only four electrofishing stations were performed.

The largemouth bass relative weight was very good for both electrofishing periods (S1 – 112 and S2 – 104), indicating that abundant forage is available to the bass in this reservoir.

Fingerling LMB were encountered only in S1 (January to June) sample. Figure 1 and Figure 2, present the LMB Length Frequency for S1 and S2 respectively.

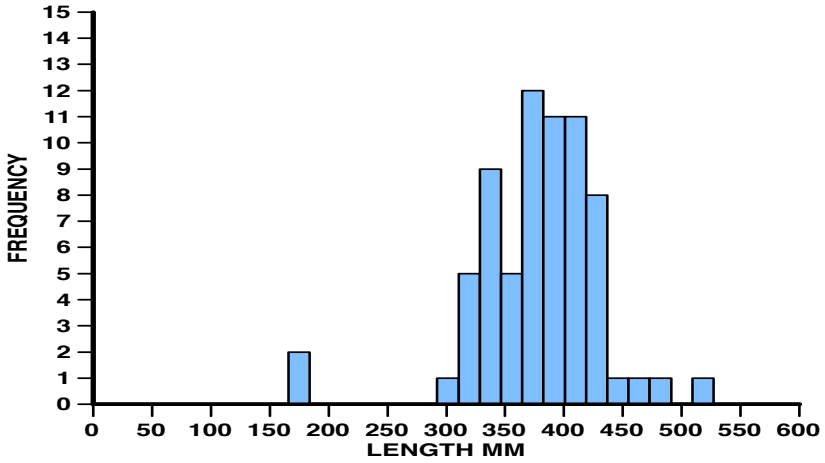

Figure 1. Length frequency distribution of largemouth bass at Toa Vaca reservoir during S1 electrofishing (2010).

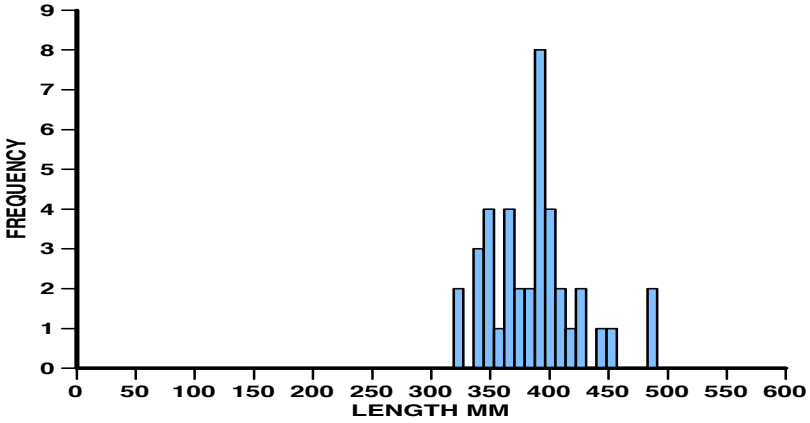

Figure 2. Length frequency distribution of largemouth bass at Toa Vaca reservoir during S2 electrofishing (2010).

LOIZA

Eleven fish species were found in Loiza reservoir (Table 4). In the past, this reservoir was one of Puerto Rico's more diverse reservoirs, principally because of the presence of several tropical aquarium species. The dominant species was the red devil *Amphilophus spp*. with a relative abundance of 31%. The peacock bass (*Cichla ocellaris*), one of the favorite sport fish on the island, showed a relative abundance of 33 individuals (66%) during S1 electrofishing sampling and 22 individuals (32%) during S2. Threadfin shad, mosquito fish and the native shrimp *Xiphocaris elongata* were present but they have not been included in the species composition analysis.

Table 4. Target species present in electrofishing samples at Loiza reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition S1 2010	% Composition S2 2010	% Average Composition
armored catfish	11 (23)	28 (41)	19.5
blue tilapia	6 (13)	3 (4)	4.5
firemouth cichlid	1 (1)	1 (2)	1.0
guapote tigre	2 (4)	4 (5)	3.0
largemouth bass	0	6 (9)	3.0
mozambique tilapia	4 (9)	6 (9)	5.0
peacock bass	33 (66)	22 (32)	27.5
redbreast tilapia	3 (6)	8 (12)	5.5
red devil	40 (81)	22 (32)	31.0
Total	100 (203)	100 (146)	100

Guapote tigre *Parachromis managuensis* that was introduced by university aquaculture researchers before 2003 to control the tilapia populations in an experimental aquaculture farm in Lajas, Puerto Rico, was caught for the first time in Loiza reservoir during electrofishing sampling 2008 and is still present. This cichlid, native to Costa Rica, is considered highly

piscivorous and aggressive (Infobase). Loiza Reservoir thus joins Carite Reservoir in having 3 top-level predators.

Largemouth bass Length Frequency for Loiza reservoir in S2 is shown in Figure 3.

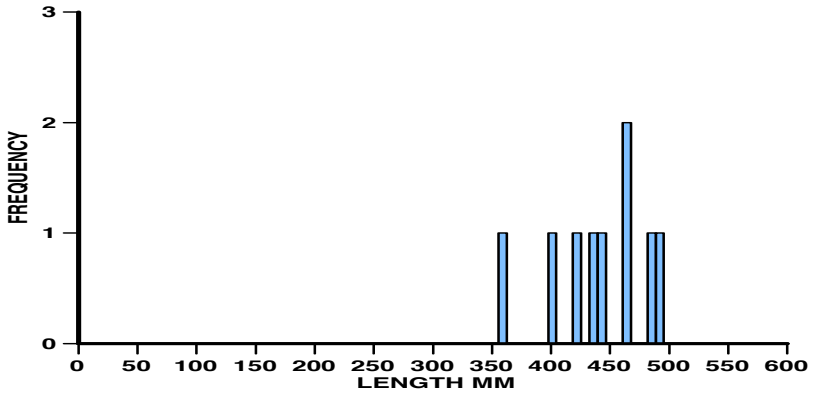

Figure 3. Length frequency distribution of largemouth bass at Loiza reservoir during S2 electrofishing (2010).

CPUE information and LMB Relative Weights in Loiza reservoir for S1 and S2 2010 are presented in Table 5.

Table 5. Total CPUE, LMB CPUE and LMB Relative Weight for Loiza reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	203	0	-----
S2 2010	146	6	116.7

CARITE

In Carite reservoir, a total of eleven fish species were found. Historically, this reservoir had distinguished itself from almost all other reservoirs in Puerto Rico (except Patillas and now Loiza) by having 3 top-level predators (largemouth bass, peacock bass and bigmouth sleepers). This year wasn't different, with the native bigmouth sleeper *(Gobiomorus dormitor)* the most abundant species (25% in S1 and 10% in S2), followed by redear sunfish (11% in S1 and 20% in S2). The largemouth bass *Micropterus salmoides* (15% in S1 and 13% in S2) and the peacock bass (9% in S1 and 11% in S2).

The mosquito fish was present, however, no threadfin shad were detected. Also, the emergent aquatic plant alligatorweed (*Alternanthera philoxeroides)* was ubiquitous in most of the electrofishing sampling stations.

Table 6. Target species present in electrofishing samples at Carite reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition Spring 2010	% Composition Fall 2010	% Average Composition
armored catfish	2 (1)	0	1.0
bluegill	0	4 (2)	2.0
bigmouth sleeper	46 (25)	22 (10)	34.0
channel catfish	9 (5)	13 (6)	11.0
largemouth bass	15 (8)	13 (6)	14.0
mozambique tilapia	2 (1)	9 (4)	5.5
peacock bass	9 (5)	11 (5)	10.0
redbreast sunfish	2 (1)	4 (2)	3.0
redbreast tilapia	4 (2)	4 (2)	4.0
redear sunfish	11 (6)	20 (9)	15.5
Total	100 (54)	100 (46)	100

LMB CPUE was 8 fish/hour for S1 and 6 fish/hour for S2. The LMB condition factor (Wr) was 82.5 for S1 and 81.2 for S2 sampling, showing a very low condition for largemouth bass in both samplings (Table 7). This could be due in part to the absence of threadfin shad, which is an important forage species.

Table 7. Total CPUE, LMB CPUE and LMB relative weight for Carite reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	54	8	82.5
S2 2010	46	6	81.2

Only one largemouth bass was at fingerling size (approximately 76 mm TL – 203 mm TL) during the S1 electrofishing, Figure 4, but not any during S2.

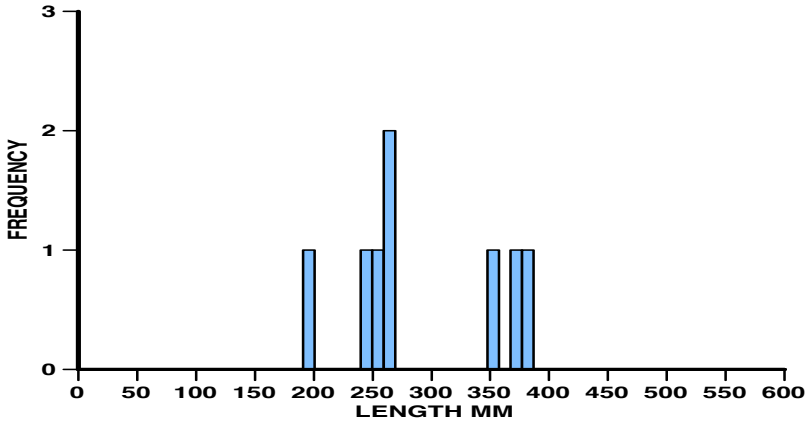

Figure 4. Length frequency distribution of largemouth bass at Carite reservoir during S1 electrofishing (2010).

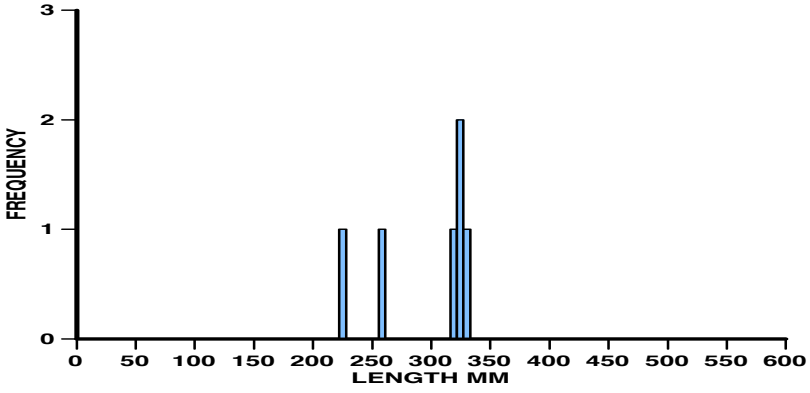

Figure 5. Length frequency distribution of largemouth bass at Carite reservoir during S2 electrofishing (2010).

CIDRA

Eleven fish species in total were represented in the electrofishing samples from Cidra reservoir (Table 8). Also, threadfin shad were present abundantly though they have not been included in the species composition analysis. Largemouth bass, one of our target fish, showed a relative abundance of 20 individuals (8%) for S1, and 15 individuals (13%) for S2. The dominant species was redbreast tilapia (*Tilapia rendalli)* followed by the peacock bass. For the first time, two specimens of the red devil were detected during electrofishing sampling at Cidra reservoir.

Table 8. Target species present in electrofishing samples at Cidra reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition S1 2010	% Composition S2 2010	% Average Composition
armored catfish	17 (40)	9 (11)	13.0
blue tilapia	2 (4)	1 (1)	1.5
channel catfish	4 (10)	2 (2)	3.0
largemouth bass	8 (20)	13 (15)	10.5
mozambique tilapia	5 (12)	6 (7)	5.5
peacock bass	15 (35)	28 (33)	21.5
redbreast sunfish	2 (5)	3 (4)	2.5
redbreast tilapia	27 (65)	31 (37)	29.0
redear sunfish	20 (48)	5 (6)	12.5
red devil*	0	2 (2)	1.0
Total	100 (239)	100 (118)	100

*First time detected during electrofishing.

LMB CPUE was 20 fish/hour for S1 and 15 fish/hour for S2. The LMB condition factor (Wr) was 98.0 for S1 and 99.2 for S2 sampling showing an acceptable condition for largemouth bass in both semesters (Table 9).

Table 9. Total CPUE, LMB CPUE and LMB relative weight for Cidra reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	239	20	98.0
S2 2010	118	15	99.2

Figures 6 and 7 present the LMB Length Frequency for S1 and S2 respectively. No LMB at fingerling size were found at Cidra reservoir for any of the electrofishing periods.

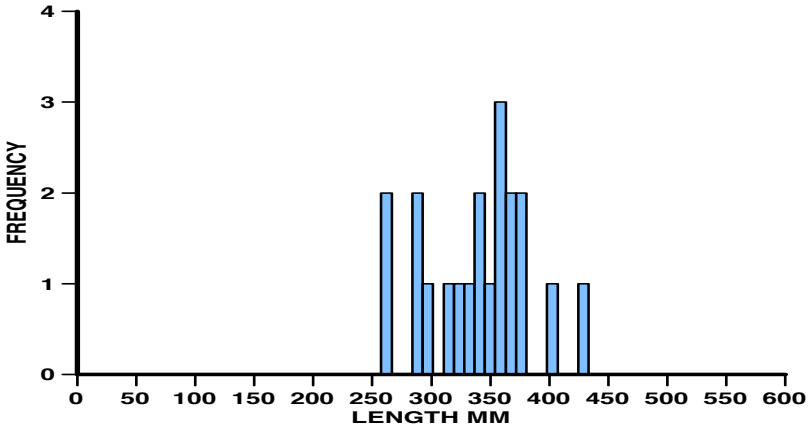

Figure 6. Length frequency distribution of largemouth bass at Cidra reservoir during S1 electrofishing (2010).

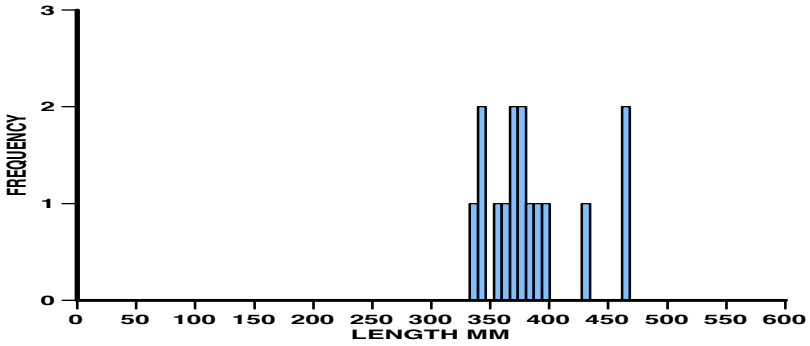

Figure 7. Length frequency distribution of largemouth bass at Cidra reservoir during S2 electrofishing (2010).

CAONILLAS

In this reservoir, ten fish species were represented in 2010 electrofishing. Threadfin shad were observed during the sampling but were not used as part of the species composition analysis. The dominant species were the invasive armored catfish (*Pterygoplichthys pardalis*) (39.5%) and the red devil (21.0%), Table 10. Redbreast tilapia is present at a relative abundance of 14.5%.

The firemouth cichlid (*Thorichthys meeki*) is also present at a relative abundance of 9.5%. This is another cichlid that was introduced to the island's reservoirs, probably from aquarium related sources. Same as the red devil, they have been established in some other reservoirs such as Loiza and Dos Bocas.

During electrofishing sampling in S2 we observed some dead armored catfish and tilapias. Additionally we notice sediment in the reservoir coming from road reparation work. The dissolved oxygen was very low (2.28mg/L) and the transparency of the water as measured with a secchi disk was 99 cm (Table 14).

Table 10. Target species present in electrofishing samples at Caonillas reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition S1 2010	% Composition S2 2010	% Average Composition
armored catfish	38 (50)	41 (69)	39.5
blue tilapia	5 (7)	7 (12)	6.0
firemouth cichlid	14 (19)	5 (8)	9.5
largemouth bass	2 (2)	2 (3)	2.0
mozambique tilapia	2 (3)	3 (6)	2.5
peacock bass	3 (4)	4 (7)	3.5

redbreast tilapia	13 (17)	16 (28)	14.5
red devil	21 (28)	21 (35)	21.0
redear sunfish	2 (2)	1 (2)	7.0
Total	100 (132)	100 (170)	100

No fingerling sized largemouth bass were found in either of the electrofishing samplings (Figure 8 and Figure 9).

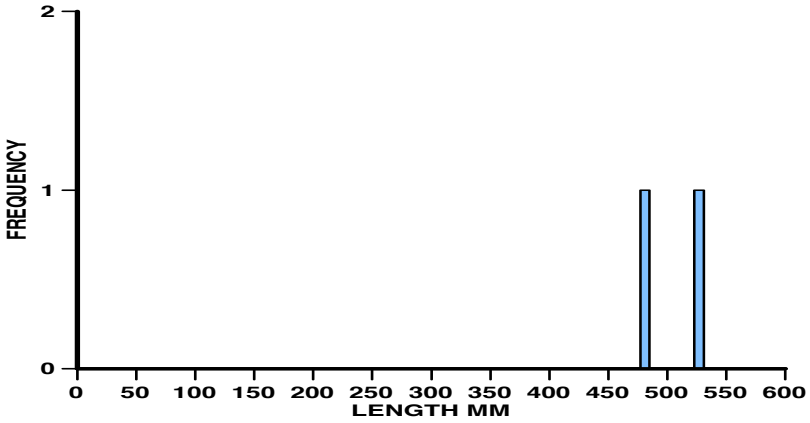

Figure 8. Length frequency distribution of largemouth bass at Caonillas reservoir during S1 electrofishing (2010).

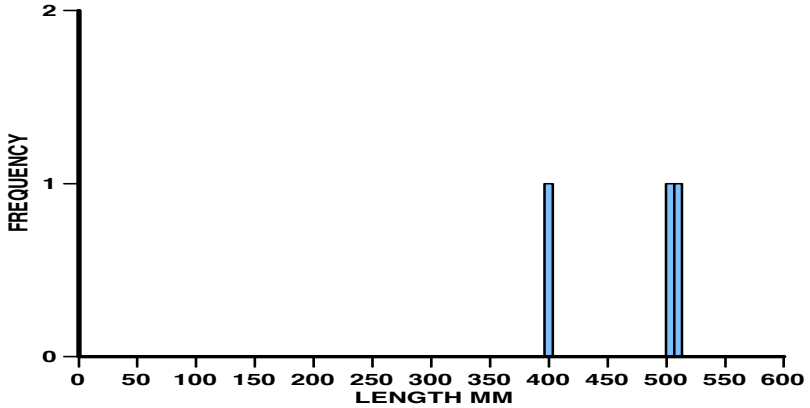

Figure 9. Length frequency distribution of largemouth bass at Caonillas reservoir during S2 electrofishing (2010).

Total CPUE, LMB CPUE and LMB relative weight is presented in Table 11. LMB CPUE S1 electrofishing was 2 fish/hour and LMB CPUE for S2 electrofishing was 3.6 fish/hour, which is very low for both samplings. Likewise, the condition factor for largemouth bass was extremely low during both samplings.

Table 11. Total CPUE, LMB CPUE and LMB Condition Factor for Caonillas reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	132	2	78.1
S2 2010	170	3.6*	67.3

*Only five electrofishing stations.

DOS BOCAS

A total of 13 fish species were found in Dos Bocas reservoir (Table 12), such that this reservoir has the greatest species diversity among the six monitored. Hundreds of threadfin shad were observed during both samplings (S1 and S2) and also the mosquito fish was present. However neither of these two species has been included in the species composition analysis.

The dominant species were the red devil (33.5%) and armored catfish (29.0%). The firemouth cichlid was present at a relative abundance of 7% and 11% for S1 and S2 respectively. Largemouth bass showed a low relative abundance of 0% (1 individual) for S1 and 3% (8 individuals) for S2. Dos Bocas reservoir has historically had bass recruitment problems.

Table 12. Target species present in electrofishing samples at Dos Bocas reservoir during 2010. The number of fish of each species appears in parentheses.

Species	% Composition S1 2010	% Composition S2 2010	% Average Composition
armored catfish	32 (92)	26 (76)	29.0
blue tilapia	28 (82)	6 (16)	17.0

brown bullhead	0 (1)	0 (1)	0
channel catfish	2 (5)	2 (5)	2.0
firemouth cichlid	7 (19)	11 (33)	9.0
largemouth bass	0 (1)	3 (8)	1.5
mozambique tilapia	7 (19)	2 (6)	4.5
peacock bass	0	2 (6)	1.0
redbreast tilapia	2 (7)	3 (7)	2.5
red devil	22 (63)	45 (131)	33.5
redear sunfish	0 (1)	0	0
Total	100 (290)	100 (289)	100

Total Catch per Unit of Effort (CPUE fish/hour), LMB CPUE and LMB Relative Weight (Wr) at Dos Bocas reservoir for S1 and S2 (2010) is presented in Table 13.

Table 13. Total CPUE, LMB CPUE and LMB relative weight for Dos Bocas reservoir for 2010.

Sample	TOTAL CATCH CPUE (fish/hour)	LMB CPUE (fish/hour)	MEAN LMB Wr
S1 2010	290	1	113.0
S2 2010	289	8	118.6

LMB CPUE was very low during S1 sampling. However, largemouth bass condition factor was very good during both semesters. This is to be expected as this reservoir has abundant forage species (threadfin shad, *tilapia spp*. and mosquito fish) and many other ornamental fish while the largemouth bass population density is very low.

LMB relative abundance was 0% for S1 with only one individual and or S2 sampling was 3% with 8 individuals (Figure 10).

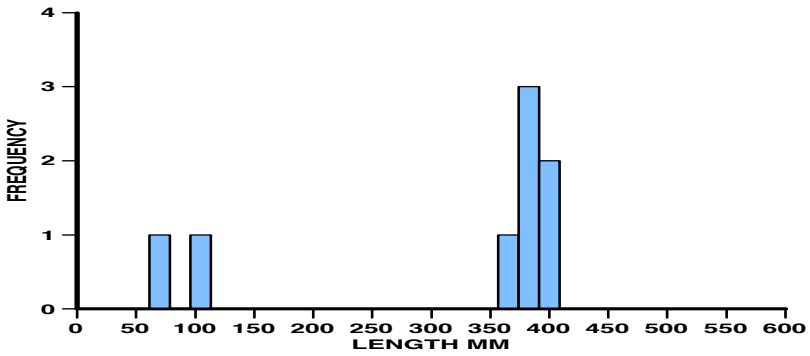

Figure 10. Length frequency distribution of largemouth bass at Dos Bocas reservoir during S2 electrofishing (2010).

Water Quality

Water quality parameters were monitored at each reservoir when it was possible. The parameters measured were temperature, secchi, dissolved oxygen and conductivity. Also, the reservoir depth was taken at the point where the others parameters were measured.

Table 14 shows the water quality data for all reservoirs during S1 and S2 electrofishing samplings.

Table 14. Water quality data for the six reservoirs sampled during 2010.

	Temperature (°C)	Secchi (cm)	O. D. (mg/l)	Depth (feet)	Conductivity (μ)
Toa Vaca	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**
	29.5 / †	117.0 / 117.0	4.44 / †	† / †	281.3 / †
Loiza	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**
	29.8 / †	104.0 / 117.0	7.80 / †	41.8 / †	284.0 / †
Carite	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**
	28.2 / 23.3	109.0 / 152.0	4.50 / 6.55	† / †	86.9 / 83.0
Cidra	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**
	24.8 / †	116.0 / 135.0	6.75 / †	41.4 / †	175.5 / †
Caonillas	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**	**S1** / **S2**
	27.6 / 24.6	190.0 / 99.0	5.79 / 2.28	† / †	189.5 / 156.4

Dos Bocas	**S1**	/	**S2**	**S1**	/	**S2**	**S1**	/	**S2**	**S1**	/	**S2**	**S1**	/	**S2**
	28.3	/	25.1	101.0	/	142.0	7.10	/	6.10	64.0	/	†	206.7	/	192.6

† Data not collected.

Discussion:

Toa Vaca reservoir had the lowest species diversity among the reservoirs sampled (9 fish species). On the other hand, it had the greatest largemouth bass abundance (mean LMB CPUE 71.25 fish/hour) of all reservoirs sampled during 2010. This reservoir has not been stocked with largemouth bass since 2003. However, it had a healthy largemouth bass population with representation of all sizes (Average Composition of 29%) and excellent condition (Wr=112.2 for S1 and Wr=104 for S2). The most abundant fish species in this reservoir was the redear sunfish (38%).

Loiza reservoir presented a species diversity of 11 fish species. The sunfish species (*Lepomis spp.)* that was part of the fish species composition in the past were absent during 2010 samplings. The peacock bass, one of the favorite sport fish on the island, showed a relative abundance of 27.5%. The guapote tigre that was caught for the first time during electrofishing sampling (2009), is still present in this reservoir.

In June 2009, a largemouth bass relocation (of specimens >= 254 mm) from Cerrillos reservoir to Loiza was performed. The intention was to improve the LMB population with adult individuals, to avoid predation by peacock bass or guapote tigre. Although fingerlings (50.8 mm – 101.6 mm) stockings had been performed (2007 and 2008), largemouth bass relative abundance was extremely low (only 1 individual). In Loiza reservoir, some electrofishing sampling areas were restricted due a heavy infestation of water hyacinth and water lettuce, which cover a significant part of the lake's surface area.

In Carite reservoir, a total of eleven fish species were found. Historically, this reservoir had distinguished itself from almost all other reservoirs in Puerto Rico (except Patillas and now Loiza) by having 3 top-level predators (largemouth bass, peacock bass and bigmouth sleepers). This year wasn't different, with the native bigmouth sleeper *(Gobiomorus dormitor)* the most abundant species (25% in S1 and 10% in S2), followed by redear sunfish (11% in S1 and 20% in S2) and largemouth bass *Micropterus salmoides* (15% in S1 and 13% in S2).

In the fish community at Carite reservoir, the most abundant fish species is the bigmouth sleeper (34%) followed by the redear sunfish (15.5%). This reservoir has the particularity of maintaining a healthy population of bigmouth sleeper, so it is an alternative to those fishermen that prefer this fish. According to Bacheler et al. 2004, in Carite reservoir, recreational fishermen frequently target, catch, and consume bigmouth sleepers. The largemouth bass relative abundance was 14% and the peacock bass was (10.0%).

LMB condition for S1 (Wr=82.5) and S2 (Wr=81.2) is considering very low. In this reservoir, the threadfin shad, an important forage species, was not been detected by electrofishing.

In Cidra, eleven fish species in total were represented in the electrofishing samples. The dominant species was redbreast tilapia 29% followed by the peacock bass 21.5%. LMB average composition was 10.5% and apparently the abundant populations of redbreast tilapia and shad contribute to excellent largemouth bass condition (Wr averaging 98.61%).

For the first time, two specimens of the red devil were detected during electrofishing sampling at Cidra reservoir. This invasive species has increased its distribution in the water bodies of the island. It has been reported in Guajataca, Loiza, Caonillas, and Dos Bocas.

In Caonillas, the dominant species were the invasive armored catfish (39.5%) and the red devil (21.0%). The red devil was detected in this reservoir for the first time in 2007, and the firemouth cichlid (detected for the first time in 2008) are still present at Caonillas reservoir. Largemouth bass relative abundance was very low (2.0%) although this reservoir was stocked with largemouth bass fingerlings several times during 2006, 2007, 2008 and 2009. We understand that one of the possible factors affecting the largemouth bass population in Caonillas is the presence of the armored catfish, and its spawning habits of construct nesting burrows close to each other compromising the reservoir shore stability. This together with the water levels fluctuations in the reservoir and the constructions close to the reservoir basin could be affecting the largemouth bass spawning sites. Also, the illegal fishing, reported by the sport fishermen, may be another factor affecting the largemouth bass population in Caonillas reservoir.

Dos Bocas presented the highest species richness among the six reservoirs sampled (13 fish species). The dominant species were the red devil (33.5%) and armored catfish (29.0%). These are two undesirable exotic species. The firemouth cichlid was present at a relative abundance of 9%. Largemouth bass showed a low relative abundance of 1.5%.

Recommendations:

- In Cidra where there is a fishing Club and adequate facilities for the users, supplemental largemouth bass stocking should continue with high priority.

- In Carite reservoir where three of the island's top level predators, bigmouth sleeper, peacock bass and largemouth bass are present, the forage species stocking should continue, including the threadfin shad if its absence can be confirmed. However, it is possible that the low productivity of Carite's waters limit the capability of threadfin shad to develop high abundance.

- In Toa Vaca, where a healthy largemouth bass population exists, no largemouth bass or forage species stocking should be performed.

- Toa Vaca reservoir is considered to construct a public boat ramp sponsored by DNER in order to promote sport fishing. This reservoir keeps a tremendous largemouth bass population that should be available to all the sport fishermen. At the present, the Puerto Rico Electrical Power Authority administers this reservoir, thus, an agreement to develop this kind of project needs to be in place.

- The translocation of adult LMB is a management strategy that might be appropriate for reservoirs that lack natural reproduction of LMB if the presence of other predatory species make survival of stocked fingerlings less successful than desired.

- The presence of exotic species in the island's reservoir has worsened. Some of these species are present in Loiza, Dos Bocas, Caonillas, La Plata, Lucchetti, Patillas, Guayabal and Guajataca reservoirs. Now they are also present at Cidra reservoir and we expect

their range to extend eventually to other reservoirs. It is recommended to investigate the impact of invasive species on fresh water habitat and sportfish populations. Aquatic Resources Educational Program (Project F-9) should continue to educate the public about the problem of aquatic invasives.

- The armored catfish high relative abundance in Caonillas (39.5%), and Dos Bocas (29%) reservoir is still a matter of concern. It was present in the six reservoirs sampled in 2010. Also we were informed that it was detected also in Cerrillos reservoir. We know about the negative impact this species causes to the reservoir shoreline hence it is recommended to advocate the capture and consumption of this species and to prohibit the release of this species back into the reservoir when it is caught. Also the importation of this species by aquarium organism importers should be prohibited. It is suspected that multiple introductions were performed by aquarium hobbyists discarding their pets without understanding the consequences of their actions (Williams et al., 1994). An intense educational campaign should be performed to the general public in order to educate about this important matter.

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