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THE FIRST ANNUAL

QUARRY POND FISHING DERBY

Sponsored by

University of Hawaii Marine Option Program
Campus Center Snack Bar

Held on

28 January, 1977

Under the Leadership of

Mark H. Suiso
Janet H. Senaga
David B. Eckert

Report Submitted

12 May 1977

INTRODUCTION

A fishing derby was originally proposed (by MHS) as a social activity for the Marine Option Program for the beginning of the Spring semester, 1977. It was felt that such an event would renew involvement of veteran members and serve as an informal introduction for new members into the activities of the Program.

Upon further consideration the derby was seen to provide opportunity for training, both in the organization and implementation of social activities and in estimation of population parameters and environmental condition

METHODS

The Site

The "quarry" pond, adjacent to the tennis courts in the southern end of the Manoa campus of the University of Hawaii, was selected for the derby site (Fig. 1). This choice was based on ready access for the Manoa student population, known presence of fish, and pleasant, grassy appearance of the surrounding area. Permission to use the pond was granted by Mr. Walter Muraoka, Director of Physical Planning and Construction.

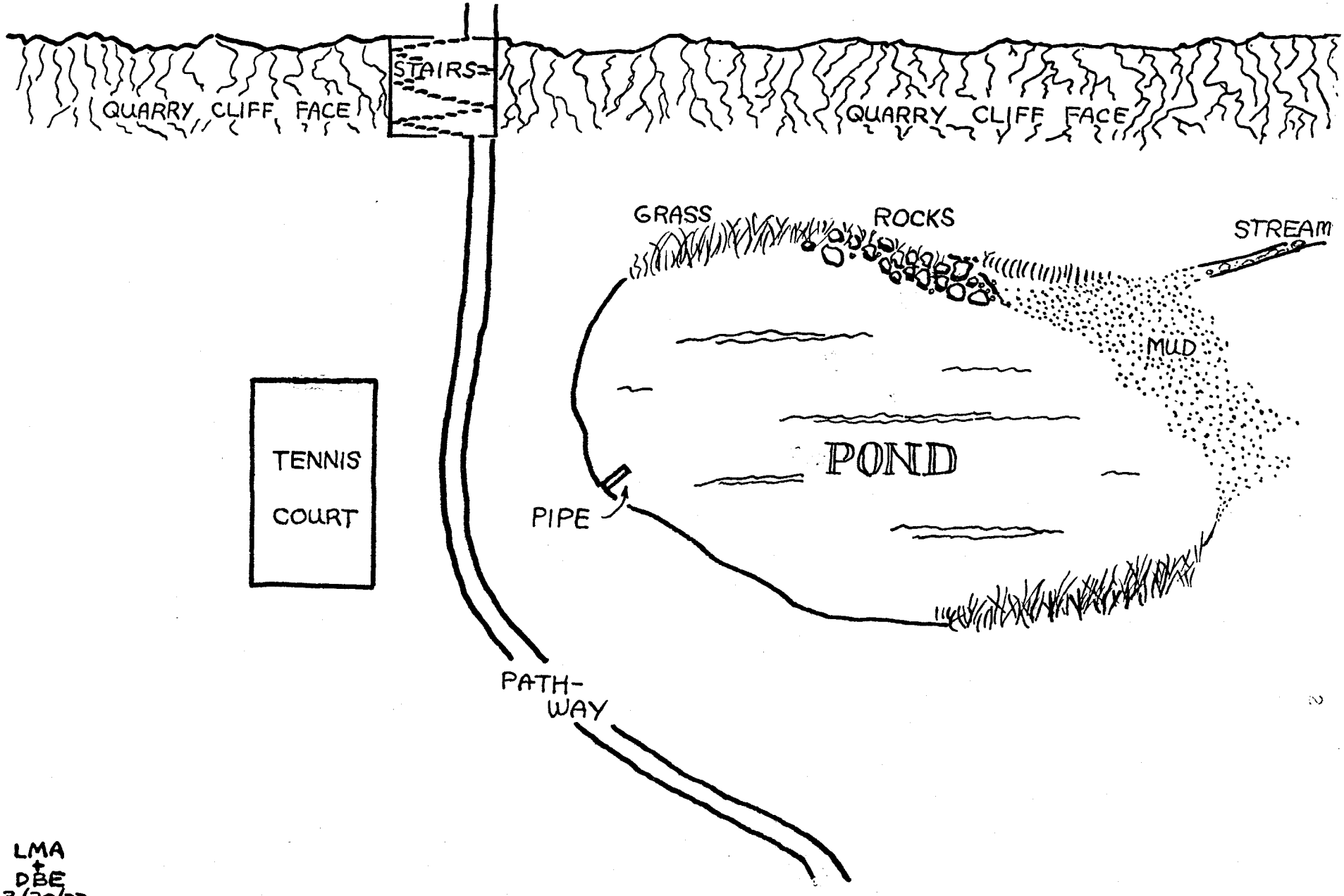
Fishing

Traditional bamboo poles, without reels, were chosen for ease and simplicity. Approximately 30 poles, each about six feet in length, were borrowed from various sources and were provided to participants. Poles were rigged with 4-, 6-, or 10-lb-test monofilament line, #10 or #15 mustad hooks, and 0.5 oz. split shot prior to distribution. Small pieces of commercially available white bread, rolled by hand into balls of dough by the participants themselves, were used as bait. This bait was selected because of traditional effectiveness, low cost, and inoffensiveness to inexperienced "fisherpersons."

Estimation Techniques

The mark-recapture method (Ricker 1975) was chosen for estimation of pop-

Figure 1. Map of the quarry pond.



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ulation size. This method depends on marking individuals at initial capture, releasing them, and distinguishing between recaptured and newly captured individuals collected during a second sampling effort (Appendix A). Fish captured during the derby were marked by clipping one of the pelvic fins; this method has an established tradition of simplicity, ease of recognition, mildness of injury, and high survival rate because fish are processed rapidly and returned quickly to the water.

The Derby

Mr. Chuck Relya, manager of the Campus Center Snack Bar, aggreed to cosponsor the derby and to furnish prizes in return for promotional considera tion for the Snack Bar's "Happy Hour" feature; thus the First Annual Quarry Pond Fishing Derby was held from 3:00 to 4:30, immediately before the "Happy Hour," on the afternoon of 28 January, 1977.

Each participant in the derby was given a pole and permitted to fish anywhere around the pond's perimeter. Advice concerning favorable locations was given upon request. Immediately upon capture each fish was brought to a central processing station for identification, notation of total length (tip of snout to tip of tail fin) and angler, and fin clipping. The fish was then released.

Promptly at the end of the contest winners were announced in four categories: largest fish; most fish caught by an individual; fish judged most unusual; and smallest fish. Participants were invited to adjourn to the Snack Bar, where the prizes (menu items) were awarded during the "Happy Hour."

RESULTS

Although only a few participants were present at the onset of the derby, their number rapidly grew to btween 20 and 25; some had to leave before the conclusion but these were replaced by others attracted to the activity. In addition the number of spectators fluctuated between 10 and 30 throughout the course of the contest.

Under the prodedure used, four persons were required to operate the derby.

One distributed poles and bait; a team of two received, unhooked, measured, marked, and released the fish; and one served as the recorder. Also in attendance were a staff reporter and a staff photographer from ka leo o hawaii, the campus newspaper (see Appendix B).

Participants caught 161 fish, representing at least five genera in four families (Table 1). Previous casual observation had suggested the presence of tilapias, mollies, and guppies in the pond; the actual catch was dominated by tilapias since the poeciliids were generally too small to hook. Although the fish recorded as "tilapia" almost certainly include more than one species, uncertainties of distinction and specific attribution led us to combine these in the category "Tilapia spp." The most abundant form of tilapia was thought to be T. mossambica (cf. Katayama 1967). Also captured were several catfish; repeatedly seen (and reportedly hooked but getting away) was a large koi (Cyprinus carpio).

Observation during the the week following the derby revealed no dead fish, fouled water, or other evidence of lasting effects on the pond or its inhabitants.

Table 1. The catch (scientific names conform to Katayama 1967).

FISH	CATCH	SIZE RANGE (in cm)	MEAN SIZE (in cm)
Cichlids			
tilapias (Tilapia spp.*)	150	4.5-28.7	10.8
Poeciliids			
mollies (Mollienesia latipina)	7	4.2- 7.0	6.0
guppies (Lebistes reticulatus)	1	3.3	3.3
Clariids			
Chinese catfish (Clarias fuscus)	3	19.8-24.5	21.5

*see text for details

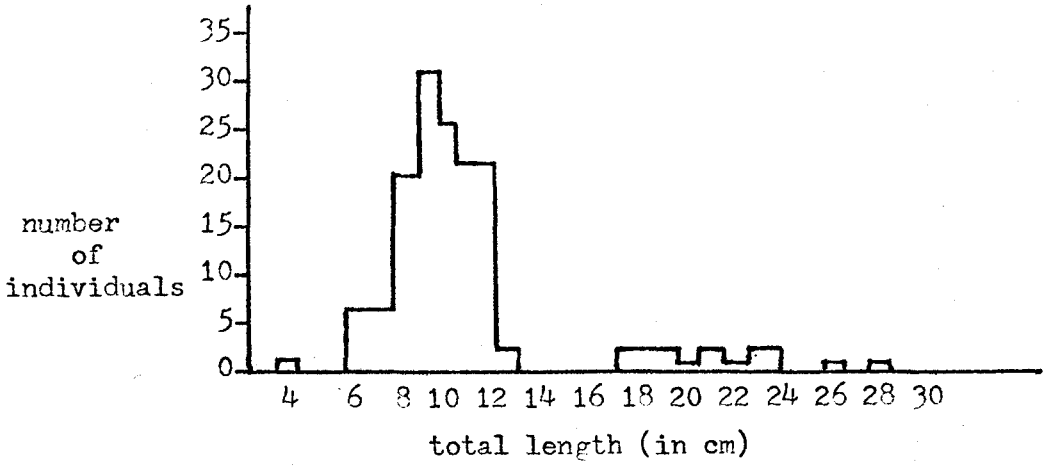
DISCUSSION

Participant's backgrounds ranged from no previous fishing experience to considerable local expertise. All gave evidence of enjoying the activity, and requests for a repetition were received. Although the fact of competition did not seem to be very important to most of the participants, it probably heightened interest and intensified their pleasure. The winners were obviously pleased. Spectators appeared amused or approving, or both. For those with no previous contact with the Marine Option Program, the fishing derby was clearly a favorable introduction.

The mark-recapture method used, while apparently successful in avoiding significant harm to the fish, proved inadequate for estimation of population size in the context of a single afternoon. The original plan was to designate the first 30 minutes of the derby as the initial period of capture and marking (recaptures during this interval were to be disregarded), and to treat the last 30 minutes as the second capture period. However, not one marked fish was recaptured although the rate at which fish were caught did not noticably diminish. Aside from the obvious insufficiency of data, this reveals equally obvious violation of the fundamental assumption underlying the mark-recapture method (refer to Appendix A). The methodological failure could perhaps be resolved by a much longer interval--possibly one of several weeks--between sampling efforts. Such a procedure would introduce complicating variables such as intensity of effort, environmental change, and temporal (e.g. seasonal) cycles; analysis capable of dealing with the complexity seems more appropriate to an advanced class than to the present efforts of the Marine Option Program. At least, the relatively steady catch rate despite complete avoidance of recapture indicates the fish population of the pond to be considerably larger than the total catch.

Two distinct size classes, one with a mean length of 8.7 cm and the other with a mean of 20.1 cm, were apparent within the tilapia catch (Fig. 2). If tilapia reproduction is at all seasonal, as is true of most fish, the bimodal size distribution indicates two generations; perhaps tilapia survive in the quarry pond for two years or longer. With subsequent samples it should prove possible to estimate growth rates (by the Peterson method; Appendix A) and to

Figure 2. Size distribution in the tilapia catch (n=150).



estimate more precisely the longevity attainable in the quarry pond. Another indication of good water quality in the pond is that none of the fish showed signs of injury, disease, or parasitism. This also suggests that whatever the size of the fish population in January, 1977, it did not exceed the carrying capacity of the pond at that time. However, since the pond water level is likely to fluctuate, in response to seasonal and less predictable cycles, and because modification of the surrounding landscaping may be expected to alter conditions within the pond, a program of periodic sampling is recommended. If possible, this activity should be combined with the appropriate instructional and social components of the University.

CONCLUSIONS

1. As a social event the fishing derby was an unqualified success. Participants and spectators enjoyed themselves alike, requesting future derbies. Competition added interest but did not dominate the casual atmosphere; social exchange was enhanced by award of the prizes in the Campus Center Snack Bar.

2. Both the Marine Option Program and Snack Bar recieved favorable publicity. The Marine Option Program made contact with a number of interested students, including several who had not attended the derby; while it is doubtful whether sales have materially increased at the Snack Bar, an use-

ful public service was rendered at very small expense.

3. Although unsuccessful at achieving its intended purpose, the population survey was nonetheless informative. The quarry pond was found to harbor an unexpectedly large, diverse, and apparently healthy community of aquatic animals.

4. The fishing derby has proven to be worthy of continuation on the bases of social value and indirect educational value through promotion of the Marine Option Program. In its present form it can also serve as a gross indicator of environmental conditions in the quarry pond. And with suitable modification of format, the fishing derby concept could provide quantitative information of scientific and managerial value, direct educational value, and undiminished social value.

ACKNOWLEDGEMENTS

We thank the following persons, without whose cooperation and support there would have been no fishing derby: Mr. Walter Muraoka, Director of Physical Planning and Construction, University of Hawaii (Manoa campus), for permission to fish in the quarry pond and for interest in our technical results; Mr. Chuck Relya, Manager, Campus Center Snack Bar, for enthusiastic support and generous donation of the prizes; Mr. Randall Ching, and the many others who loaned us their bamboo poles; and Mr. John Nakamura, who graciously allowed himself to be pressed into service as recorder.

REFERENCES

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APPENDIX A: Population-parametric methods

1. Mark-recapture estimation of population size

The mark-reproduction technique is performed as follows--

a) individuals collected during an initial capture effort are counted, marked, and released;

b) during the second capture effort careful distinction is made between unmarked individuals (captured now for the first time) and marked individuals (which are now recaptured);

c) the ratio of recaptured individuals (known from (b)) to total number of individuals captured during the second effort (known from (b)) to the total mumber of individuals in the population at the time of the second effort (unknown).

In mathematical symbolism,

$$\frac{\text{recapture}}{\text{marks}} = \frac{\text{captures at second time}}{\text{population at second time}}$$

For this relationship to be valid, an essential assumption must be made: that the probability of capturing any one individual, marked or not, must be exactly the same as the probability of capturing any other individual, marked or not. Applied to the present situation, this means that capture and marking do not affect survival or condition during the interval between efforts (which seems reasonable, owing to the short interval and subsequent absence of dead fish), and that capture and marking do not affect the behavior of the fish after release (clearly invalid here, unless the total population size is literally astronomical).

2, Peterson-modal estimation of size-specific growth rates

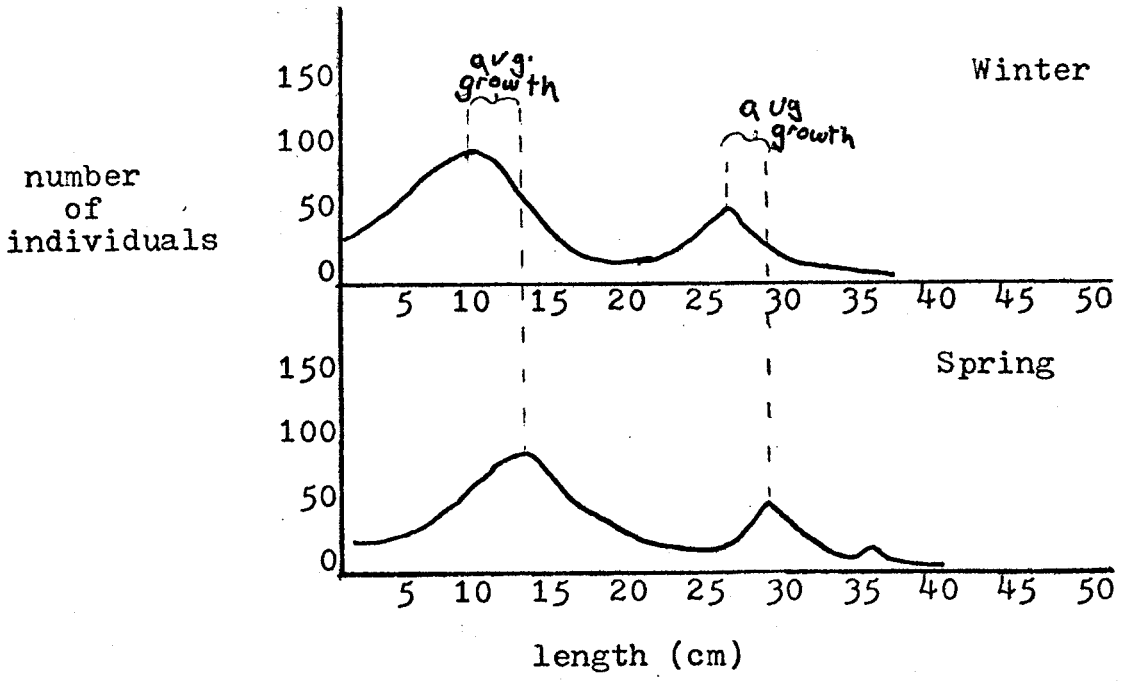


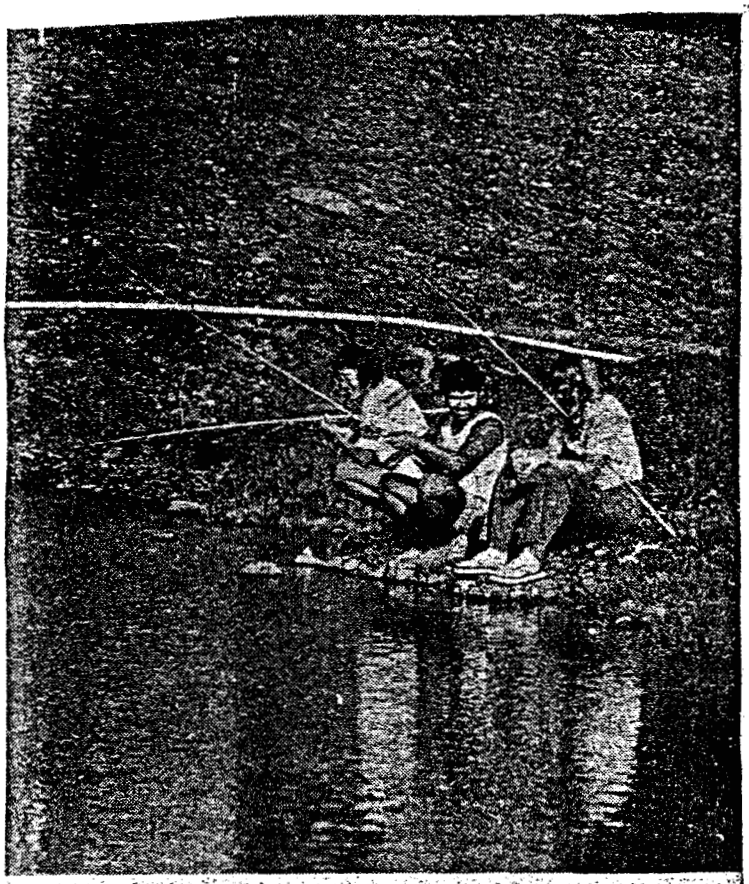
Figure showing hypothetical length-frequency curves illustrating Peterson method.

The Peterson method may be applied with repeated, large-scale samples of populations with one or more distinctive modal or mean sizes (presumably reflecting periodic spawning). Since the intervals between sampling are to be known, differences in length modes or means reflect average growth for each particular size class during each interval.

APPENDIX B: Campus newspaper story on the First Annual Quarry Pond Fishing Derby

ka leo o hawaii
the voice of hawaii
Vol. LV No. 41 University of Hawaii Wed., Feb. 2, 1977

Front page ...



This serene setting is ideal for three students intent on relaxation and fun. No, they did not venture to the Nuuanu Valley, but simply walked down a flight of stairs to the Quarry. Their patience and skill was rewarded. See story on page 5. photo by Gordon Tomita

Winners of the First Annual Fishing Derby held last Friday at the Quarry pond. From left, Pat Lee snagged the smallest fish, Guy Anzai wrestled in the largest fish and go-getter Randy Ching caught the most fish. Alicia Uehara hooked the most unusual fish. photo by Gordon Tomita

something fishy here

fishing derby held

by DEBRA C. LEE
staff reporter

Two loaves of bread, an armful of bamboo fishing poles, a meter stick and a scorekeeper were all eager fishermen needed last Friday for the UH's First Annual Fishing Derby.

The derby, co-sponsored by the Marine Options Program and the Campus Center Snack Bar, was held at the Quarry Pond next to the tennis courts from 3 to 4:40 p.m.

THE OBJECT of the contest was to hook the largest, smallest, most unusual or largest number of fish using bread for bait. Prizes were pizzas from the CC Snack Bar.

Amid cries of "Do frogs count?," "What's my prize if I catch the Loch Ness Monster?" and "Yech! Who's gonna take this smelly fish off of my hook?," four winners emerged.

Guy Anzai hooked a whopper of a talapia, which measured 28.7 cm from end to end. Pat Lee had the smallest fish, a minnow, at 3.3 cm. Alicia Uehara hooked something related to the talapia, which could not be immediately identified and Randy Ching brought in a chart-breaking record of 32 talapia.

A TOTAL of 161 fish were caught, including talapia, catfish, minnows and guppies. The fish were measured, marked and returned to the pond. One participant claimed to have hooked a huge orange and white carp, but as usual, it got away.

Mark Suiso and Janet Senega of the Marine Option Program planned the derby "just for fun." "We did this as kids," Suiso said. "It was fun, so we thought we'd try it again. Besides, the plant maintenance people want to know what's in the pond."

Suiso and Senega received permission to hold the derby at the pond from Walter Muraoka of plant maintenence. They hope to hold another fishing derby to find out if there are any other types of creatures lurking in t depths of the Quarry pond.

They will announce the next derby by posters, word of mouth and Ka Leo for those who are daring enough to undergo the event.

... lead story and second photograph, Page 5.