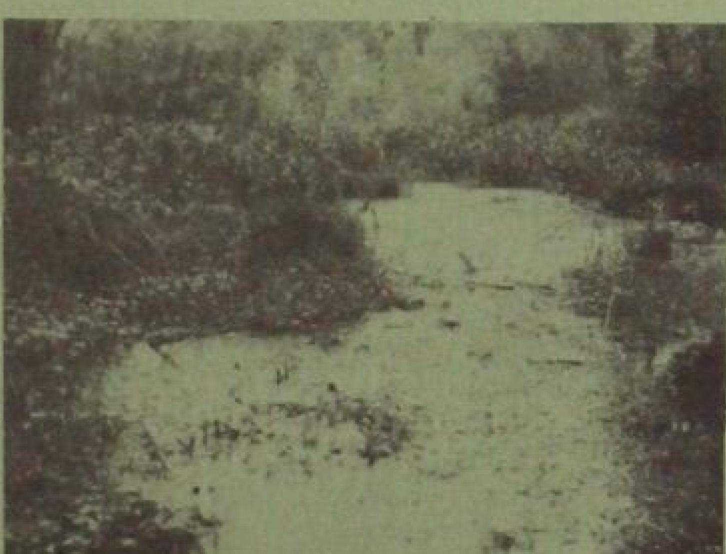
AQUATIC PLANT CONTROL RESEARCH PROGRAM



TECHNICAL REPORT A-78-2

LARGE-SCALE OPERATIONS MANAGEMENT TEST OF USE OF THE WHITE AMUR FOR CONTROL OF PROBLEM AQUATIC PLANTS

Report 1

BASELINE STUDIES

Volume V

The Herpetofauna of Lake Conway, Florida

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This report summarizes the baseline conditions for the amphibian and reptile populations of Lake Conway, Florida, for the 15-month study period, June 1977-September 1978. These results will be used later to determine whether any changes in the herpetofauna result from the introduction of the white amur (Ctenopharyngodon idella) into the lake system to control aquatic vegetation. This baseline report includes detailed descriptions of the herpetofaunal study

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sites and methods and community analyses of the temporal and spatial distributions and densities of the species by pool.

A total of 5,836 individuals representing 11 amphibian species and 16 reptilian species were observed or captured on Lake Conway during the baseline study period. Approximately 93% of the total species pool was obtained within the first 3,000 specimens, and between 70% and 80% of the predicted herpetofauna inhabiting each pool has been recorded. Of the 27 species presently recorded from the Lake Conway complex, 11 occur in all pools and together account for 94.4% of the total sample. The mean relative densities of 11 species were found to vary significantly between pools. Development of the shoreline for housing during the baseline study period was shown to have a negative impact on some amphibian and reptile populations.

PREFACE

The work described in this volume was performed under Contract No. DACW39-76-C-0047 between the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Miss., and the University of South Florida, Tampa. The work was sponsored by the U. S. Army Engineer District, Jacksonville, and by the Office, Chief of Engineers, U. S. Army.

This is the fifth of eight volumes that constitute the first of a series of reports documenting a large-scale operations management test of use of the white amur for control of problem aquatic plants in Lake Conway, Florida. Report 1 presents the results of the baseline studies of Lake Conway; subsequent reports will present the annual poststocking results.

This volume was written by Mr. J. Steve Godley, Mr. G. Thomas Bancroft, and Dr. Roy W. McDiarmid of the Department of Biology of the University of South Florida.

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The work was monitored at WES in the Environmental Laboratory (EL) by Mr. R. F. Theriot under the general supervision of Dr. John Harrison, Chief, EL, and Mr. B. O. Benn, Chief, Environmental Systems Division (ESD), and under the direct supervision of Mr. J. L. Decell, Manager, Aquatic Plant Control Research Program.

Commanders and Directors of WES during the period of the contract and preparation of the report were COL J. L. Cannon, CE, and COL Nelson P. Conover, CE. Technical Director was Mr. F. R. Brown.

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WHITE AMUR FOR CONTROL OF PROBLEM AQUATIC PLANTS

BASELINE STUDIES

The Herpetofauna of Lake Conway, Florida

PART I: INTRODUCTION

1. The environment of central Florida with its extensive lake habitats provides an ideal setting for intensive field studies of subtropical aquatic ecosystems. With the exception of a few local studies, no detailed, integrative investigations of aquatic community dynamics exist. Thus, the proposal by the U.S. Army Engineer Waterways Experiment Station (Addor and Theriot 1977) to investigate the suitability of the white amur (Ctenopharyngodon idella, herein referred to as white amur) as a potential biological control agent of hydrilla (Hydrilla verticillata), a recently introduced aquatic plant in the Lake Conway System of central Florida, was particularly interesting and timely. Not only did the proposed study include an evaluation of the effectiveness of the white amur as a weed control agent and its impact, direct or indirect, on the associated biota of the system, but also it provided an opportunity to do the first detailed study of a community of amphibians and reptiles in a large aquatic environment.

2. In June of 1977 a study of the herpetofauna of Lake Conway was initiated with the following objectives: (a) to determine the species of amphibians and reptiles inhabiting the lake system; (b) to ascertain the habitat requirements, distribution, ecology, and seasonal activity of these species in the system; (c) to establish quantitative baseline population data for the more common or otherwise important species in each pool in the system including density by habitat, relative age (size) structure, movements, growth, reproduction, food habits, and related parameters as deemed feasible; (d) to quantitatively monitor changes in

the species composition or their population parameters during post-stocking periods; and (e) to determine whether any changes are the result, directly or indirectly, of the white amur weed control program.

3. This report summarizes the findings of the amphibian and reptile study on Lake Conway for the 15-month period from June 1977 through September 1978. Although the white amur was introduced into Lake Conway in September 1977, only three months after the herpetofaunal project began, the data presented herein necessarily are considered "baseline" to which subsequent poststocking periods will be compared. Included are detailed descriptions of the herpetofaunal study sites, sampling methods and techniques, and data collection procedures. In addition, this report provides for the baseline study period a list of the amphibian and reptile species encountered on Lake Conway, an analysis of their temporal and spatial densities and distributions, and a composite of those parameters deemed important to understanding community dynamics within the system. Future poststocking reports also will include detailed accounts of the individual species, emphasizing temporal changes in the herpetofauna of Lake Conway.

PART II: METHODS AND MATERIALS

4. The first month of fieldwork was spent surveying the total Lake Conway system and associated waterways for habitat types. Based on this reconnaissance, one section of shoreline and one deepwater transect in each pool of the Lake Conway complex were selected for future censusing and permanent trapping stations (Figure 1). These sites contained all the major vegetation types with their associated water depths and substratum and were representative of the habitats available to the herpetofauna within the Lake Conway system. Each permanent shoreline site is described in detail in Part III, "The Lake Conway System."

5. Along the entire length of each permanent shoreline site numbered stakes were placed 10 m. apart in 30 to 60 cm. of water. The stakes facilitated location of capture points and subsequent movement of all marked amphibians and reptiles and served as permanent trapping stations. At each trapping station estimates of the percent plant species cover within a 2-sq.-m. area of the trap, water depth, and substratum were recorded quarterly from October 1977 through September 1978, and biannually thereafter.

6. At the permanent shoreline sites, mark and recapture population studies were conducted twice a month; destructive samples for stomach and reproductive analyses of selected species were taken monthly, or as time permitted, from distant areas of similar habitat within the lake system. Destructive samples were placed on ice at capture and frozen for future analysis. Animals that accidentally drowned in traps or were killed inadvertently during processing also were frozen and, when possible, saved for analysis. Later, all samples were preserved in 10 percent formalin and dissected at the University of South Florida. For food habit studies, the preserved stomach sample was blotted dry, then weighed. The number of individuals of a prey taxa and their estimated percent of total weight were recorded. If a prey taxa made up more than 50 percent of a stomach sample, its individual weight also was taken. Reproductive analysis included weighing the testes and epididymes of males, the ovaries and oviducts of females, and counting, weighing, and

measuring the ovarian follicles, oviductal eggs (or embryos), and corpora lutea of females.

7. The deepwater sites duplicated vegetation transects of the Florida Department of Natural Resources (Nall and Schardt 1978). Traps were set for one day 100 m. apart at FDNR sampling points on a quarterly basis. Only destructive samples were taken in deepwater benthic traps because it was impossible to prevent drowning of specimens. Trap success of amphibians and reptiles at deepwater sites during the first year was extremely low compared to shoreline trapping. These low densities made it impossible to detect statistical differences in population parameters as a result of the white amur introduction without a substantial increase in effort. As a result, deepwater funnel trapping was discontinued after one year of sampling, and the time was devoted to more profitable research.

8. Thus, the herpetofaunal sampling program involved spending 3 days and 2 nights every other week on the lake so that each permanent shoreline site was censused and sampled by traps twice a month. Alternate weeks were spent in the laboratory processing data and destructive samples. Deepwater sampling required an additional day and night per quarter.

Sampling Equipment and Techniques

9. Because of the ecological and behavioral differences that characterize the amphibian and reptile species of Lake Conway, several different kinds of collecting equipment and techniques were used. A 5.33-m. (16-ft.) john boat with a 25-h.p. (18.6-kw.) outboard motor was used in placing and monitoring funnel traps, in conducting alligator counts, and in censusing shoreline sites. Brief descriptions of these and other major sampling methods are given in the following paragraphs.

Funnel trapping

10. Funnel traps, 60x30x30 cm., were designed specifically to sample aquatic salamanders, tadpoles, small carnivorous turtles, and several species of water snakes. Most funnel traps were constructed of

3-mm. black plastic Vexar netting (Du Pont De Nemours & Co., Model No. 5-59-V-360-BABK) stretched over welded metal frames with funnel entrances at each end. Some wire mesh funnel traps of the same dimensions were used in dense stands of cattails (Typha latifolia) at the Middle and East Pool sites. Wire traps were used at these sites because rice rats, Oryzomys palustris, were common and gnawed numerous holes in Vexar traps.

11. All traps were baited with fresh, cut fish and set for a 24-hr. period. To determine general diel activity patterns for the more common species, all shoreline traps were checked at dawn and dusk during the baseline study period. Shoreline, littoral zone traps were placed on the substratum with the top above water to prevent drowning of animals; deepwater traps were submerged on the bottom.

12. The number of traps set at permanent shoreline sites was increased gradually during the first year as newly constructed traps became available and as the sizes of the permanent sites were expanded (see Part III, "The Lake Conway System"). By July 1978, the total number of shoreline trapping stations was stabilized at 77 and traps were set twice a month at each station. A total of 61 traps was used for quarterly, deepwater trapping samples (October and December 1977, April and July 1978). Within- and between-site comparisons of the first years' trapping data are based on seasonal trap success per total number of trap days per season. The standard notation of trap days (sum of all traps set/24 hrs.) was used throughout the study.

Herp-patrol

13. In addition to funnel trapping, all permanent shoreline sites were censused twice a month at night from a boat. Preliminary work showed that most species of amphibians and reptiles were more active and much easier to catch at night than during the day. This censusing technique, termed "herp-patrol," involved use of an electric motor and two 12-volt, 120,000-candlepower spotlights. During herp-patrols the permanent shoreline sites were sampled by motoring slowly along the edge of the littoral zone. One spotlight in the rear was directed towards

the emergent vegetation while the other in the front was shined in adjacent, open water. A third individual collected animals with a dipnet or by hand. The species, time, location, water depth, vegetation type, substratum, activity, and behavior for all specimens observed or heard calling were recorded on standardized data sheets. All captured individuals were sexed, measured, weighed, marked, and released at the capture point the following day.

14. Herp-patrol sampling effort was standardized for each permanent shoreline site but varied between sites because of differences in the lengths of shoreline sampled. Between-site comparisons were based on the number of animals collected per unit total search time. Beginning in November 1977, herp-patrols on permanent sites were replicated each sampling night and assigned a run number of I or II to provide an estimate of within-site variance. The same collecting path was used on each run.

Alligator census

15. The alligator population of the entire Lake Conway complex was estimated using nocturnal censusing techniques. In the first year the entire shoreline of the lake system was scanned monthly using a 12-volt, 120,000-candlepower spotlight to search for the characteristic red-orange glow of the alligators' eyes. When an animal was located, it was approached quietly until the size of the alligator could be estimated. The number, locations, and approximate sizes of all sighted individuals were recorded. Because the Lake Conway alligator population was found to be small, easily monitored, and unlikely to have a significant impact on the white amur population, nocturnal censusing of alligators was reduced to a bimonthly schedule in June 1978.

16. In addition, during the summer nesting season all stretches of suitable shoreline habitat were searched for nesting females. All located nests were monitored until the young hatched in the fall. Juvenile alligator production was estimated by counting the number of hatched eggs and by counting the number of juveniles seen at the nest site. Incubating eggs were not counted because nest disturbance significantly increases predation (T.C. Hines, personal communication).

Gill netting

17. All animals collected in gill nets operated by the Florida Game and Fresh Water Fish Commission (FGFWFC) were taken and used for kill samples. Two gill nets of various mesh sizes were set monthly in South, Middle, and West Pool during the baseline study period (Guillory 1979).

18. In addition, several other methods were used as time and man-power permitted. Although quantifiable, these methods either were selective in the species taken or were done on an irregular basis in order to increase the sample for a particular species.

Shoreline census

19. All animals collected or observed while checking or setting funnel traps, or while walking along the shore at other times, were assigned to the sampling technique of shoreline census. The data collected and the procedures used during shoreline censuses were similar to those used during herp-patrols.

Hyacinth sieving

20. At some sites, dense stands of the introduced waterhyacinth, *Eichhornia crassipes*, were sampled with a 0.5635-sq.-m. boxlike hyacinth sieve. The sampling procedure and device are described in Godley (1979).

Drift fence

21. At several sites, permanent drift fences (5 m. long, 0.8 m. high) were set with pairs of unbaited funnel traps at each end. In South Pool, two drift fences, one upland (20 m. from water) and one aquatic (perpendicular to shore), were set in November 1977 at markers 160 and 130, respectively. Another aquatic fence was set perpendicular to shore at marker 1135 in Middle Pool in April 1977. Within a month, the drift fences at both sites were vandalized or stolen and the sampling method was discontinued.

Electrofishing

22. Specimens of amphibians and reptiles selectively obtained by FGFWFC personnel while electrofishing on Lake Conway (Guillory 1979) generally were used for stomach and reproductive analyses.

Marking and Measuring Procedures

23. The Lake Conway herpetofaunal sampling program involved long-term mark and recapture studies of certain species and incidental and/or short-term studies of the remaining species. Because of the varied ecologies and life histories of the species, several different measuring and marking procedures were required.

Aquatic salamanders

24. Early in the study no permanent marking technique was available for salamanders of the families Amphiumidae and Sirenidae, and species either were released unmarked or taken for destructive samples. From September 1977 through July 1978, adults of these salamanders were experimentally tagged with plastic numbered Floy fish tags (Model No. FD-68) similar to those described by Pough (1970). The tags, measuring 4.8 cm. in total length and weighing 2.0 g., were inserted through the base of the salamander's tail with the T-portion protruding through the opposite side (salamanders lack the pterygial bones of fishes preventing internal anchorage of the T). Specimens were weighed (to 0.1 g.); then the snout-vent length (SVL = tip of snout to posterior margin of vent) and total length (TL = tip of snout to end of tail) were measured by placing the salamander in a V-shaped, clear plexiglas measuring device. As a secondary means of identification, all bite marks, scars, and deformities of salamanders were recorded beginning in March 1978. After processing, all salamanders were released at the capture site.

25. Many salamanders that were Floy-tagged, released in the field, and subsequently recaptured had lost the tag. Although these animals could be distinguished as a recapture, positive identification of individuals often was not possible and Floy-tagging of salamanders was discontinued. Beginning in August 1978, all *Siren* and *Amphiuma* were cold-branded for 8 to 10 sec. on the abdomen with copper wire numbers dipped in liquid nitrogen. These brands were recognizable for at least one year in the field and this method was used for salamanders for the remainder of the study.

Aquatic turtles

26. All species of aquatic turtles in the lake system were monitored. Standard measurements taken were weight (to nearest 0.1 g. for turtles < 1000 g.; to nearest 10 g. for turtles > 1000 g.), carapace length (CL = straight mid-line distance with calipers from anterior-most to posterior-most point of carapace), and plastron length (PL = anterior-most to posterior-most point of plastron) to the nearest millimeter. Throughout the study emydid turtles (Chrysemys floridana, C. nelsoni, Deirochelys reticularia) were marked by drilling holes in (adults) or notching (juveniles) the marginal scutes using a numbering system similar to Cagle's (1939). Other species were toe-clipped from July 1977 through December 1977 but marked with numbered Floy fish tags (4.8 cm. total length, 2.0 g.) beginning in January 1978. The Floy tags were inserted through a hole drilled in a posterior marginal scute of the turtle.

Alligators

27. American alligators (Alligator mississippiensis) were not marked for recapture on Lake Conway because (1) the animals are difficult and dangerous to capture and process, (2) Federal and State permits are required for these procedures, and (3) the alligator population on Lake Conway was found to be small and easily monitored by nocturnal censuses and nest counts.

Larval amphibians

28. The composition, distribution, and relative density of the tadpole fauna of Lake Conway were estimated for each permanent trapping station at the five littoral zone sites. Initially, five standard sweeps of a dipnet were taken before the funnel traps were set at a station. In addition, the number and identity of all tadpoles collected at littoral zone and deepwater trapping sites were recorded. Because dipnetting disturbed the vegetation at trapping stations and was less successful at collecting tadpoles than funnel traps, dipnetting was discontinued. Beginning in April 1978, all tadpoles collected in traps were staged (Gosner 1960) to obtain populational estimates of developmental rates and larval lifespan.

Adult frogs

29. Frog species were monitored by shoreline censuses, herp-patrols, and funnel traps. Because of their cryptic nature and difficulties in capturing adequate numbers of most species, adult frogs in general were not marked for recapture. Instead, the most effective method of monitoring the frog populations proved to be recording on data sheets the calling activities of males during herp-patrols. This sampling technique was expanded in December 1977 to include actual counts of calling males per 10-m. increments on all permanent shoreline sites.

Snakes

30. All species of aquatic and semiaquatic snakes on Lake Conway were monitored by diurnal shoreline censuses, herp-patrols, and funnel traps. All collected snakes were identified, sexed (adults only), weighed and measured, individually marked by clipping the ventral scales (Brown and Parker 1976), and released at the capture site.

PART III: THE LAKE CONWAY SYSTEM

31. Lake Conway is a 737.1-ha. urban lake (Figure 1) located in South Orlando, Orange County, Florida. The lake consists of five interconnecting pools, which include Lake Gatlin, Little Lake Conway (East and West Pool), and Lake Conway (Middle and South Pool). The lake system is mesotrophic with gradually increasing eutrophic conditions as one proceeds north through the various pools. The substratum is primarily sand, except in areas of thick vegetation near shore or in dredged canals where organic detritus or silt has accumulated. The bottom contours are rather steep when compared with most central Florida lakes and greater than 30% of the total lake bottom is deeper than 6.0 m. (Nall and Schardt 1978).

32. Illinois pondweed (Potomogeton illinoensis) and eelgrass (Vallisneria americana) are the dominant shallow-water (<2.0 m.) aquatic macrophytes in most pools; stonewart (Nitella megacarpa) and hydrilla (Hydrilla verticillata) predominate in deeper water but do not grow below 6.0 m. (Nall and Schardt 1978). As is typical of many urban Florida lakes, most of the emergent vegetation on Lake Conway has been removed for beach development. However, in some areas a narrow fringe of maidencane (Panicum hemitomon), lake rush (Fuirena scirpoides), pickerelweed (Pontederia lanceolata), or cattail (Typha latifolia) remains intact.

33. Given below are brief descriptions of each permanent shoreline herpetofaunal sampling site and a chronology of important events. Appendix A summarizes the vegetation and substratum characteristics of each permanent trapping station for all sites during the baseline study period (June 1977-September 1978). Because deepwater trapping stations duplicated the vegetation transects of the Florida Department of Natural Resources (Nall and Schardt 1978) in South (Transect A_1-A_2), Middle (C_1-C_2), East (I_1-I_2), and West Pool (K_1-K_2) and Lake Gatlin (N_1-N_2), these data are not duplicated herein.

South Pool

34. The South Pool permanent shoreline site was 530 m. in length and included the only major section of undeveloped shoreline in the pool (Figure 1). Other small, scattered patches of *Panicum* or *Typha* occurred along the eastern and northeastern shores of South Pool. However, these patches of emergent vegetation had houses on the upland. The South Pool site underwent rapid development for housing during the baseline study period (see below) and was studied intensively during this period to determine the effects of shoreline development on the herpetofauna.

35. Initially, the site consisted of 460 m. of emergent vegetation stretching from an offshoot canal (marker 0) to the Perkins Street boat ramp (460), and 70 m. of urban beach habitat (460-530) to the northwest of the boat ramp. In order of decreasing abundance, the more common emergent species were *Fuirena scirpoides*, *Panicum hemitomon*, *Pontederia lanceolata*, *Typha latifolia*, and *Eichhornia crassipes* (see Appendix A). Undisturbed pine-flatwoods or evergreen bayhead associations occurred upland from the vegetated shoreline. *Potomogeton illinoensis* was the dominant nearshore submergent aquatic plant. The substratum at the trapping stations was mostly sand except for a buildup of mucky detritus at markers 0-30 and 450-460 where waterhyacinths occurred. A thin (3-5 cm.) layer of silt usually was present at stations dominated by stands of *P. lanceolata*. Offshore, the water dropped off rapidly to 2.0 m. in depth except at marker 0 (and offsite eastward from there) and between markers 320-530 (and northward), where broad shelves of shallow water (less than 1.5 m.) extended 30 to 60 m. out from shore.

36. As mentioned, development of the South Pool shoreline site for housing occurred during the baseline study period. Habitat modification began in August 1977 and involved the clearing of access roads through the upland pine-palmetto flatwoods and abandoned orange groves west of the site, an area of approximately 20 ha. In late September 1977, construction of two houses began immediately upland between markers 345-460, and another house was started along the shore in mid-October between markers 240 and 300. In both cases construction activity was

limited to the housing sites. The littoral zone and first 30 to 50 m. of transitional uplands were left undisturbed temporarily. In mid-December all remaining vegetation in these two areas (240-300, 345-460) from the houses to within a meter of the waterline was cleared with bulldozers. This left only a small piece of undisturbed transition zone between 300 and 345, and a larger section from 0 to 230.

37. In late November and December 1977, most of the housing lots in the pine flatwoods and abandoned orange groves greater than 100 m. from shore between markers 200-460 were cleared of understory vegetation. By mid-April 1978, almost all remaining upland habitat (0-200) along the South Pool site had been cleared to within 30 m. of the shoreline. In late April, the remaining vegetation from markers 30 to 120 was removed with bulldozers to the waterline. Small sections of the littoral zone also were cleared from 240 to 250, 345 to 355, and 390 to 400 by June 1978.

38. In summary, within 10 months of the start of herpetofaunal sampling of Lake Conway, approximately 78% of upland and transitional zone habitats bordering the South Pool site was cleared of natural vegetation. Although most of the emergent littoral zone vegetation was left intact, most site preparation occurred in winter and early spring.

Middle Pool

39. The Middle Pool permanent shoreline site (Figure 1) was located at the northern end of a large cattail marsh that extended along much of the southeastern shore of Middle Pool. Emergent vegetation at this site was zoned with a broad, 20- to 40-m. outer fringe of cattails (*Typha latifolia*) and a narrower, denser inner zone of herbaceous aquatics. Near the trapping stations, *Fuirena scirpoides* and *Panicum hemitomon* dominated at markers 1000 to 1030, *T. latifolia* and *Pontederia lanceolata* from markers 1040 to 1170, and *Eichhornia crassipes* at markers 1180 to 1200. Upland, the site was bordered by an orange grove. In the cattail zone and immediately offshore, *Potomogeton illinoensis* was the only submergent macrophyte. At this site, *P. illinoensis* was sparsely distributed, and percent cover generally was less than 20%. The substratum was coarse

sand except in thick vegetation nearshore where a layer of organic detritus had been deposited. In general, this muck overburden increased in thickness from markers 1000 to 1200.

40. The band of emergent vegetation at the Middle Pool site was much broader than at other sites. To more accurately determine habitat preferences and to monitor the movements of marked animals, three parallel transects were established along the 200-m. length of this site. A nearshore transect, where trapping was conducted, was designated the 1000 series. To monitor amphibian and reptile activity within the cattails and to provide boat access (2000 series) during herp-patrols, a 2.0-m.-wide swath was removed from the center of the cattail marsh in October 1977. In addition, the outer edge of the cattails (3000 series) was herp-patrolled.

41. In April 1978 after nine months of study, all shoreline and upland vegetation between markers 1000 and 1120 was cleared with bulldozers and draglines. This resulted in the removal of all vegetation from trapping stations 1000 to 1120 and the 2000 series of cattails from markers 2000 to 2120. A 10-m.-wide outer fringe of cattails and the 3000 series were left intact. To document changes in amphibian and reptile distribution and abundance at this site as a result of habitat modification, normal sampling procedures were continued.

East Pool

42. The permanent sampling site in East Pool was located at the northwest end of an uninhabited island (Figure 1). This site was 200 m. in total length and consisted of a 10- to 15-m. outer fringe of cattails (*Typha latifolia*) and an inner zone of waterhyacinths (*Eichhornia crassipes*) along most of the distance. A 20-m. stretch of *Panicum hemitomon* and *Pontederia lanceolata* occurred from markers 1025 to 1045. Funnel trapping was conducted along the inner zone (1000 series) and herp-patrols (2000 series) were run along the outer edge of the emergent vegetation. A 10- to 25-cm. layer of mucky detritus was present in all areas with waterhyacinths. Immediately offshore the bottom dropped sharply to over 2.0 m.

in depth. The submergent aquatic vegetation was primarily Vallisneria americana with scattered patches of Potomogeton illinoensis on a sand bottom. No development occurred at this site during the baseline study period.

West Pool

43. The West Pool permanent shoreline site was 370 m. in total length. It encompassed the only large, continuous section of emergent vegetation in the pool and was bordered by beach habitat at both ends. The site included a 70-m. stretch of beach (markers 0-70) and a larger section of undisturbed littoral zone (markers 80-370) dominated by Panicum hemitomon-Pontederia lanceolata or P. hemitomon-Eichhornia crassipes with scattered patches of Typha latifolia. An orange grove which was regularly disked occurred 10 to 15 m. upland of the vegetated shoreline. The dominant submergent plants at the edge of the emergent vegetation were Potomogeton illinoensis and Vallisneria americana. The substratum at the trapping stations consisted of sand along the beach and a variable (5- to 20-cm.) layer of silt and organic debris in the vegetated section. The bottom contours along most of the West Pool site were gradual but several deep holes (to 2.0 m.) occurred immediately offshore.

44. During the baseline study period, no development occurred on the West Pool site. To serve as a control for the effects of housing development in South Pool and to more clearly determine the home ranges of individuals along a continuous section of habitat, the West Pool site was gradually enlarged from an original 200 m. (markers 0-200) to 370 m. (0-370) by July 1978. West Pool was chosen because this site was most similar to South Pool in terms of size, vegetation, and topography, and because it was deemed unlikely that it would be developed in the next five years.

Gatlin Canal

45. The permanent shoreline site chosen for Lake Gatlin was the entire length of the canal from Lake Gatlin to West Pool (470 m.). This site represented the most eutrophic site sampled in Lake Conway and was typical of the many shallow, dredged canals in the system. Most of the shoreline bordering Gatlin Canal consisted of yards mowed almost to the waterline. Emergent vegetation along the yards included *Panicum repens*, *Nymphaea odorata*, *Nuphar luteum*, and *Typha latifolia*, in order of decreasing abundance. Away from shore, most of the dredged bottom was less than 1.0 m. in depth, bare, and with a 0.1- to 1.0-m. layer of unconsolidated silts and muds. Large mats of floating filamentous algae were common in summer. Initially the only submergent aquatics included a small patch of *Vallisneria americana* on the east side of the canal between markers 1130 and 1150, *Cabomba caroliniana* in the west offshoot canal at marker 150, and some *Eleocharis* sp. near the bridge (markers 230-240). By the end of the baseline study period (September 1978), the *C. caroliniana* mat had spread and occurred from markers 1120 to 1150.

46. Unlike all other sites, only one herp-patrol run was done in Gatlin Canal. However, this run often required 1.5 hrs. and included a census of both the east and the west sides of the canal. To distinguish movements of marked animals across the canal, the west side of Gatlin Canal was designated the 100 series and the east side the 1000 series. A total of 20 funnel traps were set in Gatlin Canal from markers 0 to 40 and 1050 and 1190 so that all major habitats would be sampled.

47. No major development occurred in Gatlin Canal during the baseline study period other than normal mowing and yard upkeep.

PART IV: THE HERPETOFAUNA OF LAKE CONWAY

48. A total of 5,836 individuals representing 11 species of amphibians and 16 species of reptiles were observed or captured on Lake Conway during the 15-month baseline study period (June 1977-September 1978). Only species dependent on Lake Conway proper for some portion of their life cycle and therefore potentially affected by the introduction of white amur were considered. Figure 2 shows the cumulative number of species as a function of the cumulative number of individuals recorded on Lake Conway. Approximately 96.3% of the sampled herpetofaunal species was obtained within the first 3,000 specimens and one species thereafter. Based on this sample, there are three species of salamanders, eight anurans, one crocodilian, eight turtles, and seven snakes inhabiting the Lake Conway complex (Table 1). Several other rare species may be present.

49. Table 2 gives the frequency distribution of species by sampling method. On all subsequent tables, information for the different life stages (egg, larva, adult) of each species is tabulated separately. Herp-patrol and funnel traps accounted for 86.54% and 8.10%, respectively, of all animals observed or captured on Lake Conway. These two methods also produced the greatest number of captures (of 2,281 individuals, 71.2% and 20.7%, respectively).

50. The probability of capturing or observing a species also varied by sampling method. Of the 27 amphibian and reptile species known from Lake Conway, 23 species were identified on herp-patrols and three (Deirochelys reticularia, Hyla femoralis, H. squirella) were known only from herp-patrol activities. No species were taken only in funnel traps during the baseline study period, but this method did account for a sizeable portion (>30%) of the observations for Amphiuma means (93.5%), Siren lacertina (57.8%), Kinosternon subrubrum (49.1%), Nerodia cyclopion (31.1%), and most anuran larvae. Three species were known only from shoreline censuses, including a salamander (Eurycea quadridigitata) and two snakes (Regina alleni, Thamnophia sirtalis). All other species were taken by at least two sampling methods.

Species Distribution and Abundance

51. Table 3 summarizes the distribution of all amphibian and reptile species recorded from the five pools of the Lake Conway complex. These figures include the total number of specimens observed or collected by all sampling methods on and off the permanent sampling sites in each pool. Because sampling effort and catch varied between pools, these data provide only a preliminary estimate of the relative species density and abundance between pools.

52. Judging from the total cumulative species-number curve for Lake Conway shown in Figure 2 and the total number of observations recorded for each pool (Table 3), between 70% and 80% of the total herpetofaunal species inhabiting each pool has been recorded. South Pool had the greatest total number of observations (N=1,429) and the highest number of recorded species (N=22); West Pool had the lowest total number of observations (888) and recorded species (14). Other pools had intermediate values but the species rank order was not in agreement, perhaps indicating differences in habitat availability, species evenness, and/or sampling error.

53. The known distribution of herpetofaunal species varied by pool (Table 3). Of the 27 species presently recorded from the Lake Conway system, 11 occur in all pools. These 11 species account for 94.44% of the total observations; none represent less than 1.71% of the species total. Among the 16 species not known from all pools, no single species contributes more than 1.35% to the species total. Additional observations in poststocking years should more clearly define the distribution of rarer amphibians and reptiles within the Lake Conway system.

Permanent Shoreline Sites

54. Table 4 presents the distribution of the total number of individuals of all species encountered on permanent shoreline sites in each pool. These five sites accounted for 71.85% of the 5,836

herpetofaunal observations made during the baseline study period and were the major locations for funnel trapping and herp-patrolling activities. Of the 27 species presently known from Lake Conway, 26 were observed on permanent shoreline sites. One salamander (Eurycea quadridigitata), a frog (Hyla squirella), three turtles (Chelydra serpentina, Deirochelys reticularia, Kinosternon bauri), and four snakes (Coluber constrictor, Regina alleni, Thamnophis sauritus, T. sirtalis) were recorded only on these permanent sites. The treefrog Hyla femoralis is the only species on Lake Conway not known from a permanent shoreline site.

55. Table 4 also gives the mean relative density of each species on the five permanent shoreline sites as determined by the two major sampling methods: herp-patrol (mean number/hr.) and funnel traps (mean number/100 trap days). Between-pool differences in relative abundance of a species were determined by using the chi-square approximation of the nonparametric Kruskal-Wallis extension of the Mann-Whitney U-test (Barr et al. 1979) for herp-patrol trips, and the difference among proportions chi-square test (Freund 1973) for funnel trapping. The mean tested on herp-patrols was the mean number of individuals of a species observed per hour for all trips with run numbers on a permanent site (i.e., after October 1977). The proportion tested was the total number of a species captured at a site divided by the total number of trap days set at that site during the baseline study period. If significant ($P<.05$) between-pool differences were found, pair-wise comparisons of pools were made using the Mann-Whitney U-test (herp-patrols) or the difference among proportions test (funnel traps). Because the same data were analyzed for this second test, the alpha level of significance was increased to $P<.025$.

56. The mean relative densities of 11 species were found to vary significantly between the five permanent shoreline sites during the baseline study period (Table 3). Funnel trapping showed significant between-site differences in the relative densities of two salamanders (Amphiuma means, Siren lacertina), three frogs (Hyla cinerea larvae, Rana grylio adults and larvae, R. utricularia larvae), two turtles (Kinosternon subrubrum, Sternotherus odoratus), and a snake (Nerodia

cyclopion). The mean number of individuals observed or collected per hour on herp-patrols varied significantly in four species including one frog (Acris gryllus) and three turtles (Chrysemys floridana, C. nelsoni, S. odoratus).

57. Four species of frogs (Hyla cinerea, Gastrophryne carolinensis, R. grylio, R. utricularia) recorded on herp-patrols differed in the mean densities of calling males, but the site means were not significantly different if the entire baseline study period was considered (Table 4). When only the breeding seasons of these species were analyzed, significant between-site differences in mean densities were obtained for A. gryllus, H. cinerea, R. grylio, and R. utricularia (Table 5). Apparently, the large number of tied scores introduced by including the many nights during the nonbreeding season, when no frogs were calling, biased the rank sums tests and significantly reduced the differences between sites.

58. Included below are detailed community analyses of the five permanent shoreline sites on Lake Conway. For each site a "point analysis" and a "trip analysis" are presented. Point analyses show the numerical distributions of amphibians and reptiles observed or captured along 10-m. increments of the shoreline sites. Trip analyses show the numerical distributions of species through time on the bimonthly sampling trips to Lake Conway. Table 1 provides the species codes used in all point and trip analyses figures cited.

59. For both the point and the trip analyses of each site at least three figures are given, one for funnel trapping (total captures) and two for herp-patrols (anurans only, and salamanders and reptiles only). Each figure provides the total number of funnel traps set at a site (per trip or per trap station) and for herp-patrols, the total time (minutes) spent on each herp-patrol trip at a site. Thus, each figure is scaled by sampling effort. In some cases the total number of individuals recorded on the point analysis for a site will be less than the number of individuals recorded on the trip analysis for that site; this means that some individuals on a trip were not given a sample point and thus do not appear on the point analysis.

South Pool

60. The South Pool permanent shoreline site had the most diverse herpetofauna of any site (20 species), but also received the most sampling effort (Table 4). The relative density of one species (Kinosternon subrubrum) was significantly greater on South Pool than on all other sites (Table 4). The highest total number of observations for 11 other species also was recorded from the South Pool site including two frogs (Acris gryllus, Hyla squirella), four turtles (Chrysemys floridana, Kinosternon bauri, K. subrubrum, Sternotherus odoratus), and five snakes (Coluber constrictor, Farancia abacura, Nerodia cyclopion, Regina alleni, Thamnophis sirtalis). Four of these species (H. squirella, C. constrictor, R. alleni, T. sirtalis) were encountered only on the South Pool site during the baseline study period. Thus, many elements of the Lake Conway herpetofauna are best known from South Pool.

61. During the baseline study the shoreline of the South Pool site was developed gradually for a housing subdivision (Table A1). Because shoreline development was gradual, changes in herpetofaunal populations are expected to be subtle.

62. Point analysis. The distribution of all amphibians and reptiles captured in funnel traps along the South Pool permanent shoreline site is presented in Figure 3. Most (91.7%) of the 84 total captures in South Pool were concentrated between markers 0 and 100 and between markers 360 and 460, where 48.0% of the total traps was set during the baseline study period (Figure 3). In general, these more productive trapping areas at the ends of the transect were characterized by a diverse emergent flora and a mud substratum; the central, animal-poor region was dominated by Panicum hemitomon-Fuirena scirpoides and a sand substratum (see Table A1). In addition, much of this central region underwent extensive development near shore during the baseline study period (Table A1).

63. The spatial distribution of reptiles observed or collected on herp-patrols (Figure 4) was similar to the pattern observed for funnel-trapped animals (Figure 3) along the same section of shoreline (i.e., markers 0 to 460; traps were not set between 470 and 530 and thus data from this section are not comparable). Most observations (67.1%) of reptiles

on herp-patrols between markers 0 and 460 were located between 0 and 100 and 360 and 460. However, in this case the concentration of reptiles (especially Sternotherus odoratus and Chrysemys floridana) at the ends of the transect may be correlated with offshore habitat preferences rather than with their preference for emergent vegetation in the littoral zone. Both turtle species were active in shallow-water regions at night. On the South Pool site, deep water occurred immediately offshore from the emergent vegetation except at the ends of the transect (see South Pool site description, paragraph 36). At the transect ends broad shelves of shallow (< 1.5 m.) water extended out from shore and most turtles were captured in these areas (Figure 4). It is perhaps significant that the greatest concentration of turtles occurred between markers 470 and 530, a section of developed shoreline with extensive shallows but no emergent vegetation.

64. The distribution of calling frogs on the South Pool site is given in Figure 5. The cricket frog, Acris gryllus, was the most common frog on this site (Table 4, Figure 5) and was recorded calling along most of its length. Other species appeared to have a more patchy distribution during the baseline study period, but the total number of observations was small.

65. Trip analysis. Figure 6 shows the temporal distribution of amphibians and reptiles collected in funnel traps on the South Pool permanent shoreline site. In general, trap success decreased with time on the site even though the number of traps set per trip increased. The highest success rates occurred early in the study, between 21 July-24 September 1977. In this time period the few funnel traps available for sampling (N=13) were set between markers 0 and 120. These traps accounted for 34 (66.6%) of the 51 total animals taken along this section of shoreline during the baseline study period (Figure 3). When the trapline was expanded to include the entire piece of vegetated shoreline (21 March 1978), most subsequent specimens were taken between markers 0 and 120 and between markers 360 and 460, although rates of capture for 0 to 120 were lower.

66. The relatively low trapping success for any one species makes seasonal activity patterns difficult to evaluate for this site alone

(Figure 6). The only conspicuous change was the absence of the green water snake (Nerodia cyclopion) from traps between October and February. During this time N. cyclopion were observed leaving the water and entering upland overwintering sites.

67. The temporal distributions of all species other than frogs, and calling frogs, on South Pool herp-patrol trips are given in Figures 7 and 8, respectively. Most individuals of salamanders and reptiles (Figure 7) generally were observed early in the study (July-November 1977) and decreased thereafter. A secondary peak in total abundance occurred in the summer of 1978. The highest peak on 17 November 1977 was associated with the greatest amount of time spent on the site during a single trip (187 min.). However, the mean total number of individuals observed per hour on this trip (23.74/hr.) was 2.48 times the mean for all trips (9.59/hr.) and truly reflects a high, local density of animals.

68. The stinkpot, Sternotherus odoratus, accounted for a majority of the reptilian observations on nearly all herp-patrols (Figure 7). Most apparent seasonal patterns in Figure 7 can be attributed to this species, but Chrysemys floridana also followed the same trends (i.e., the relative densities of both species were high in fall and summer but low in winter and spring). Nerodia cyclopion was encountered on herp-patrols from July to November 1977, but disappeared until 27 March 1978 when a single individual was observed. No other specimens of this snake species were seen on South Pool herp-patrols throughout the remainder of the baseline study period.

69. Frog calling activity on the South Pool site varied by species and by season (Figure 8). Rana utricularia was the only species heard calling in the late fall and winter months. All other species called during spring and summer with some activity in early fall.

Middle Pool

70. The Middle Pool site had the second highest number of recorded species (18), but the mean relative density of any one species was not significantly higher or lower than other permanent shoreline sites (Table 4). Middle Pool was the only site where the salamanders Amphiuma means and Siren lacertina were equally common (A. means was

4.27 times more abundant than S. lacertina averaged over all sites, Table 4). Pig frogs (Rana grylio) and ribbon snakes (Thamnophis sauritus) were more common at the Middle Pool site than at any other site. Of the two female alligators (Alligator mississippiensis) known to nest on Lake Conway during the baseline study period, one nested in the marshes of the Middle Pool site and successfully hatched 12 to 16 young in August 1977. The nest site of this female (marker 1110) was destroyed in April 1978 (see below); to the best of the authors' knowledge, she did not nest on Lake Conway in the summer of 1978.

71. The Middle Pool site underwent significant changes during the baseline study period (Table A2). On 26 April 1978 all upland and shoreline vegetation between markers 1000 and 1120 and between 2000 and 2120 was cleared with bulldozers and draglines for a housing development but markers 1121 to 1200 and 2121 to 2200 were left intact (see paragraph 41). To better elucidate changes in the distribution and abundance of the herpetofauna as a result of this perturbation, the analyses that follow were divided into several subsets. All transects (1000, 2000, and 3000 series) were divided into "disturbed" (meters 0 to 120) and "undisturbed" (meters 121 to 200) sections. In addition, all point and trip analyses were further subdivided into before and after disturbance categories.

72. Point analysis. Figures 9 and 10, respectively, show the spatial distribution of funnel-trapped animals before and after the Middle Pool site was cleared. Before development (Figure 9), most captures (60.84%) occurred between markers 1100 and 1200, where organic detritus was thickest and waterhyacinth (Eichhornia crassipes) often was the dominant vegetation (Table A2). In the section with little organic matter (markers 1000-1090), all captures occurred in the Panicum hemitomon-Fuirena scirpoides zone between markers 1000 and 1020. Trap stations dominated by Typha latifolia or Pontederia lanceolata (1030-1090) produced no captures.

73. After habitat modification (Figure 10), only one individual (a Rana utricularia larvae) was collected in 122 trap days on the developed section (markers 1000-1120); 12 individuals representing 6 species were taken in 180 trap days before this section was cleared (Figure 9).

On the undeveloped section (markers 1130-1190), 10 individuals of 4 species were collected in 50 trap days before the adjacent section was cleared; 24 individuals of 9 species were recorded in 70 trap days after clearing. These data suggest that (1) clearing of the emergent vegetation severely reduced herpetofaunal populations in the altered areas and (2) surviving individuals may have emigrated to the adjacent, undisturbed habitat.

74. The spatial distribution of salamanders and reptiles observed on Middle Pool herp-patrols before and after habitat modification is given in Figures 11-14. The clearing of this site resulted in the removal of all aquatic vegetation on the 2000 series transect from 2000 to 2120 but left intact a narrow finger of cattails extending along the 3000 series from 3000 to 3120. Habitat between meters 130 and 190 on both herp-patrol transects was not altered (see Middle Pool site description, paragraphs 39-41).

75. In the zone of habitat alteration (meters 0-120), significant changes in the local abundance of organisms occurred on both the 2000 series and the 3000 series transects. On the disturbed portion of the 2000 series transect (2000-2120 of Figures 11 and 12), 87 specimens (7 species) were seen on 14 herp-patrols before clearing ($\bar{x}$=6.21 individuals/trip); only 4 specimens were observed in 10 trips after clearing ($\bar{x}$=0.40). On the adjoining portion of the 3000 series transect (3000-3120 of Figures 13 and 14), which was sampled on the same trips, 146 individuals were recorded before clearing ($\bar{x}$=10.43) but only 13 afterwards ($\bar{x}$=1.30). In contrast, no major changes in the abundance were noted on the undisturbed sections of either transect (2130-2200 predisturbance $\bar{x}$=1.20, postdisturbance $\bar{x}$=1.20; 3130-3200 predisturbance $\bar{x}$=2.10, postdisturbance $\bar{x}$=1.36).

76. The spatial distribution of calling frogs also varied as a result of habitat modification (Figures 15 and 16). Unfortunately, rigorous recording of the exact locations of calling males did not begin until December 1977 (see Part II: "Methods and Materials"); thus, the predisturbance period is underrepresented. However, four frog species called from markers 1000 to 1120 before disturbance (Figure 15), but only two

species were recorded from this section thereafter (Figure 16). *Acris gryllus* and *Bufo terrestris* can inhabit and successfully call from shore grass or bare beach environments. However, both *Hyla cinerea* and *Rana grylio* require thick emergent vegetation; these species apparently were extirpated from the disturbed zone.

77. Trip analysis. The temporal distribution and abundance of herpetofaunal species taken in funnel traps on the disturbed (1000-1120) and undisturbed (1120-1200) sections of the Middle Pool site are given in Figures 17 and 18, respectively. On the disturbed section (Figure 17) total trap success was significantly greater prior to habitat destruction than afterwards (χ^2=5.33, P<.05). On the undisturbed section (Figure 18) more animals were collected after habitat modification, but the difference was not significant (χ^2=2.92, .05<P<.10).

78. The distributions of salamanders and reptiles observed on the two Middle Pool transects during herp-patrol trips are provided in Figures 19-22. As previously noted, the abundance of animals decreased markedly on the disturbed sections of both transects after habitat alteration (Figures 19 and 21), but the adjoining, undisturbed sections showed no changes (Figures 20 and 22). The high number of *Sternotherus odoratus* recorded on 7 December 1977 (Figures 19 and 21) was the result of a remarkable concentration of 53 stinkpots in a 10-m.^{2} area between markers 60 and 70 of the 2000 and 3000 series transects. Such localized concentrations were not observed again on the Middle Pool site during the baseline study period.

79. The temporal distribution of calling anurans recorded on the Middle Pool site is presented in Figures 23 and 24. On the disturbed section (Figure 23), a decrease in the abundance and diversity of frog species apparently occurred after habitat modification. Because the predisturbance period (prior to December 1977) was poorly documented for calling frogs, seasonal fluctuations in calling activity on the undisturbed section (Figure 24) were difficult to detect. Most species appeared to call during the warmer summer months.

East Pool

80. A total of 15 amphibian and reptile species were observed on

the East Pool site during the baseline study period. The relative densities of three species (Amphiuma means, Siren lacertina, Hyla cinerea larvae), as measured by funnel trap success, were significantly higher at East Pool than at all other sites (Table 4). In addition, East Pool was the only site where the dwarf salamander, Eurycea quadridigitata, was found. All of these species were associated with the mats of waterhyacinth (Eichhornia crassipes) that dominated much of the site.

81. Point analysis. Compared with other permanent shoreline sites, the distribution of funnel trap captures on East Pool was more uniform (Figure 25). However, trap stations 1090 to 1200, which were dominated by waterhyacinth (Table A3), produced the greatest number of captures. Amphiuma means was the most frequently collected species on this site (Table 4) and was recorded from all trapping stations. Siren lacertina was taken at all stations except 1050 to 1100. Nerodia cyclopion appeared more common at stations with greater plant diversity. Only 2 of 15 N. cyclopion collected in East Pool funnel traps during the baseline study period were recorded from stations dominated by waterhyacinth.

82. Although sample size was small (N=62), most reptiles observed on herp-patrols (75.8%) were recorded from the second half of the transect, between markers 2110 and 2200 (Figure 26). Calling frogs also were most abundant on the latter half of the transect (Figure 27). Hyla cinerea was especially common at this site and frequently called from water-hyacinths and cattails between markers 1160 and 1180.

83. Trip analysis. Figure 28 shows the distribution through time of funnel-trapped amphibians and reptiles on the East Pool site. East Pool showed less variance than other sites during the baseline study period with no marked decline in trap success. Activity was lowest during the winter months of 1977-78, but increased in spring and stayed high in the summer and the fall of 1978. Anuran larvae (Hyla cinerea, Rana grylio, R. utricularia) were collected from May through September of 1978.

84. In contrast to funnel trapping, the number of nonfrog species observed or collected during herp-patrols on the East Pool site declined through time (Figure 29). This was due primarily to the relatively

large numbers of Sternotherus odoratus collected on early trips, which were not seen as frequently later in the study period.

85. The temporal distribution of calling frogs on East Pool was similar to that of other sites (Figure 30). Greatest activity for most species occurred from spring through early fall with a peak in late summer. Rana utricularia was the only species to call frequently in the winter.

West Pool

86. The West Pool permanent shoreline site had the lowest number of amphibian and reptilian species (N=12) recorded for any site (Table 4). This was caused by an apparently depauperate snake fauna: only one species (Nerodia cyclopion) was recorded on the West Pool site but seven were known from the Lake Conway system (Tables 3 and 4). Four turtle species (Chrysemys floridana, C. nelsoni, Sternotherus odoratus, Trionyx ferox), which were common on most of Lake Conway, were relatively rare on the West Pool site (Table 4). However, the greatest total number of observations of three frog species (Hyla cinerea, Gastrophryne carolinensis, Rana utricularia) were recorded from this site.

87. Point analysis. The spatial distributions of amphibians and reptiles collected in funnel traps on the West Pool site are given in Figure 31. Trap stations 0 through 70 were located on beach habitats in several stages of succession (Table A4). These stations produced no captures even though 24.1% of the total number of traps set in West Pool during the baseline study period were located in this region. On nonbeach trapping sites (80-370), the 13 stations dominated by waterhyacinth (Table A4) produced the greatest proportion of captures, accounting for 59.7% of the total captures but only 26.5% of the traps set.

88. As noted for South Pool, the distribution of salamanders and reptiles observed on West Pool herp-patrols appeared to be dependent primarily on offshore habitat preferences of the component species. Sternotherus odoratus was the most commonly encountered species, and over 21% of the observations of this species on West Pool were recorded at marker 30 (Figure 32). This spot was offshore from beach habitat but was the only area on the West Pool site where dense stands of Potomogeton

occurred in shallow water.

89. The distribution of all species of calling anurans on the West Pool site appeared clumped (Figure 33). The most abundant species, Hyla cinerea, requires erect vegetation for calling sites. It called primarily from four areas containing dense stands of Pontederia lanceolata or Typha latifolia (markers 120-130, 160, 220-240, 290-310). The second most common frog, Gastrophryne carolinensis, vocalized most frequently from grass clumps along four sections of the West Pool site (Figure 33).

90. Trip analysis. Figure 34 presents the temporal distributions of funnel-trapped amphibians and reptiles on the West Pool site. When the frequency of captures was adjusted for the gradual increase in trapping effort, seasonal trends in activity became more apparent. Total trap success was lowest during the cold winter months ($\bar{x}$=0; 0 individuals/119 trap days), gradually increased in spring ($\bar{x}$=0.057; 9/159) and summer ($\bar{x}$=0.206; 46/223), then decreased in fall ($\bar{x}$=0.168; 19/113). These trends are due primarily to Amphiuma means, the most commonly trapped species on the site.

91. The temporal abundances of reptiles and salamanders encountered during herp-patrols on the West Pool permanent shoreline site are given in Figure 35. Peaks of abundance appeared in the fall of 1977 and the spring of 1978, but the total sample size was small (N=65 observations). On 10 of 29 herp-patrol trips made to the West Pool site during the baseline study period, no salamanders or reptiles were observed.

92. The seasonal activity of calling frogs on the West Pool site (Figure 36) was similar to that on other sites on Lake Conway. Hyla cinerea was the most common species on West Pool and called primarily in summer with a secondary peak in spring. Although most calling of Rana utricularia occurred in fall and winter, some individuals of this species called on warm, wet summer nights from West Pool.

Gatlin Canal

93. For a disturbed man-made habitat, the Gatlin Canal site contained a surprisingly high number of species (N=14). This may be because of the diverse array of microhabitats within the canal (Table A5) and/or because of the accessibility of the two other major, alternate habitats (West

Pool and Lake Gatlin). Gatlin Canal was the only site where all species of aquatic turtles were known to occur, and the relative densities of three species (Chrysemys floridana, C. nelsoni, Sternotherus odoratus) were relatively high (Table 4). However, for the effort expended at the Gatlin Canal site the diversity and abundance of snake species was low (Table 4), probably because of the proximity of development and the tendency for land owners to kill most snakes.

94. Point analysis. The spatial distributions of amphibians and reptiles at funnel trap stations along the Gatlin Canal site are represented in Figure 37. Only 27 captures were recorded in 420 trap days at this site. As a result no between-habitat differences in abundance in Gatlin Canal were apparent for the baseline study period.

95. Figure 38 shows the distribution of salamanders and reptiles observed during herp-patrols on the west (100 series) and east (1000 series) sides of Gatlin Canal during the baseline study. Slightly more individuals (54.2% of 387 total observations) were sighted on the east side than the west side. Sternotherus odoratus was the most common reptile at this site. The largest concentration of stinkpots occurred near the entrance of Gatlin Canal into West Pool, where a large patch of Nuphar luteum was established (markers 10-40). The species also was common along the shore opposite the Nuphar bed, which was bordered by Paspalum sp. and beach habitat. Other areas in Gatlin Canal also produced large numbers of stinkpots (e.g. markers 1300-1340) but the association of the turtle with specific habitats was not obvious.

96. Compared with other sites relatively few frogs were heard calling in Gatlin Canal, but their spatial distribution appeared patchy (Figure 39). For example, the southern toad, Bufo terrestris, called only from beach habitats or where the grass was mowed to the water's edge. Hyla cinerea was heard calling mostly from stands of Pontederia lanceolata or Typha latifolia.

97. Trip analysis. Figure 40 shows the temporal abundances of amphibians and reptiles captured in funnel traps in Gatlin Canal. No individuals were taken in traps from November 1977 through February 1978. Like other sites, most captures occurred during the warm summer months.

98. The distribution of reptiles and salamanders observed on each sampling trip to Gatlin Canal is provided in Figure 41. Sternotherus odoratus was very common early in the study period (July-December 1977), but decreased in abundance thereafter with a secondary peak from June through September 1978. Chrysemys floridana and C. nelsoni exhibited a similar pattern. Changes in abundance for these species may represent seasonal movements between the canal habitat and adjoining lakes or differences in seasonal activity within Gatlin Canal.

99. Distinct seasonal differences in the calling activity of frogs were observed in Gatlin Canal (Figure 42). Rana utricularia called mostly in the winter; other species called primarily in the summer.

Deepwater Trapping Stations

100. Only one salamander (a Siren lacertina) was collected in 244 trap days at deepwater sampling sites (Figure 1) during the baseline study period. This specimen was taken in 1.2 m. of water on the East Pool site during the July 1978 sampling period. Thus, the mean trap success of amphibians and reptiles at deepwater sites was 0.41 individuals/100 trap days. This value was 40.92 times lower than the mean for all amphibians and reptiles ($\bar{x}$=16.77 individuals/100 trap days) and 5.72 times lower than the mean for S. lacertina ($\bar{x}$=2.34 individuals/100 trap days) trapped at permanent shoreline sites during the baseline study period.

PART V: DISCUSSION

101. Baseline studies of the herpetofauna of Lake Conway indicate that the lake system contains a complex and diverse assemblage of at least 27 species. A number of these species (e.g., Hyla cinerea, Amphiuma means, Alligator mississippiensis, Sternotherus odoratus, Chrysemys floridana) are common and conspicuous components of the Conway ecosystem whose functional role in food webs and community dynamics generally remains unappreciated. All of the species contribute to the diversity of the system. As such they are important in maintaining community stability, and changes in their populations provide an excellent means of monitoring the effects of environmental perturbation. In future poststocking periods, the authors' task will be (1) to determine whether any changes in the herpetofauna of Lake Conway are the result, directly or indirectly, of the white amur aquatic plant control program, and (2) to consider if these changes (if any) are consistent with the objectives of the LSOMT.

102. Unfortunately, no detailed integrative studies of a community of amphibians and reptiles inhabiting a large aquatic environment such as Lake Conway have been published. Indeed, the herpetofaunal project on Lake Conway will provide the most complete ecological data base available for a number of species, especially Amphiuma means, Siren lacertina, Chrysemys floridana, C. nelsoni, Kinosternon subrubrum, and Sternotherus odoratus. Thus, at present it is not possible to compare the herpetofauna of Lake Conway with populations inhabiting other aquatic ecosystems.

103. In general, the amphibian and reptile populations of Lake Conway can be characterized as dynamic, varying in both time and space. Presumably, future work will show that many of the temporal density fluctuations observed during the baseline study period represent seasonal changes in activity. In other cases, long-term changes in herpetofaunal populations may have occurred (e.g., shoreline development on South and Middle Pool permanent sites). Trapping and other sampling results indicate that most species of amphibians and reptiles are restricted to the littoral zone. Only a few species regularly inhabit open-water habitats,

and even these species are dependent upon the shoreline for some portion of their life cycle. Across all permanent shoreline sites, the diversity and abundance of amphibians and reptiles generally was greatest at those stations that contained an abundance of aquatic vegetation; sparsely vegetated stations or stations that were converted to beach habitats by man had a depauperate herpetofauna. If white amur have a major impact on the shallow-water emergent and submergent plants, detrimental effects on the herpetofauna are expected.

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Table 1

Checklist of amphibians and reptiles known from the Lake Conway system.

Scientific Name	Common Name	Species Code*
AMPHIBIA		
CAUDATA		
SIRENIDAE		
Siren lacertina	Greater siren	L
AMPHIUMIDAE		
Amphiuma means	Two-toed amphiuma	A
PLETHODONTIDAE		
Eurycea quadridigitata	Dwarf salamander	
ANURA		
BUFONIDAE		
Bufo terrestris	Southern toad	B,%
MICROHYLIDAE		
Gastrophryne carolinensis	Eastern narrow-mouthed toad	G
RANIDAE		
Rana grylio	Pig frog	R,+
Rana utricularia	Southern leopard frog	U,&
HYLIDAE		
Acris gryllus	Florida cricket frog	Y,*
Hyla cinerea	Green treefrog	H,$
Hyla femoralis	Pinewoods treefrog	M
Hyla squirella	Squirrel treefrog	P
REPTILIA		
CROCODILIA		
CROCODILIDAE		
Alligator mississippiensis	American alligator	E

(Continued)

* If applicable, the code for the adult life stage is followed by a larval life stage code. The codes explained here are used in Figures 3-42.

Table 1 (Concluded)

Scientific Name	Common Name	Species Code
TESTUDINATA		
CHELYDRIDAE		
Chelydra serpentina	Florida snapping turtle	O
KINOSTERNIDAE		
Kinosternon bauri	Striped mud turtle	I
Kinosternon subrubrum	Eastern mud turtle	K
Sternotherus odoratus	Stinkpot	S
EMYDIDAE		
Chrysemys floridana	Peninsular cooter	F
Chrysemys nelsoni	Florida red-bellied turtle	C
Deirochelys reticularia	Chicken turtle	D
TRIONYCHIDAE		
Trionyx ferox	Florida softshell	T
SQUAMATA		
COLUBRIDAE		
Coluber constrictor	Black racer	V
Farancia abacura	Mud snake	X
Nerodia cyclopion	Green water snake	N
Nerodia fasciata	Florida water snake	W
Regina alleni	Striped swamp snake	
Thamnophis sauritus	Peninsula ribbon snake	Z
Thamnophis sirtalis	Eastern garter snake	Q

Table 2

The distribution by sampling method of all amphibians and reptiles observed or collected on Lake Conway during the baseline study period. Summaries include the total number of individuals of a species taken by a sampling method, the percentage that a method contributes to the species total, and the percentage that a species contributes to the method total.

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
AMPHIBIA									
CAUDATA									
Amphiuma means		2 0.76% 2.99%	1 0.38% 3.13%	245 93.51% 51.80%	2 0.76% 0.04%	11 4.20% 32.35%	1 0.38% 0.74%		262 4.49%
Eurycea quadridigitata							2 100.00% 1.47%		2 0.03%
Siren lacertina		2 1.72% 2.99%	1 0.86% 3.13%	67 57.76% 14.16%	32 27.59% 0.63%	9 7.76% 26.47%	3 2.59% 2.21%	2* 1.72% 100.00%	116 1.99%
ANURA									
Acris gryllus (adults)					823 99.04% 16.28%		8 0.96% 5.88%		831 14.24%

(Continued)

* Gill net.

Table 2 (Continued)

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
A. gryllus (larvae)				1 100.00% 0.21%					1 0.02%
Bufo terrestris (adults)					299 100.00% 5.91%				299 5.12%
B. terrestris (larvae)					300 99.67% 5.93%		1 0.33% 0.74%		301 5.16%
Gastrophryne carolinensis (adults)					73 93.59% 1.44%		5 6.41% 3.68%		78 1.34%
Hyla cinerea (adults)					1298 98.62% 25.68%	3 0.23% 8.82%	15 1.15% 11.03%		1316 22.55%
H. cinerea (larvae)				11 40.74% 2.33%		6 22.22% 17.65%			17 0.29%
H. femoralis (adults)					4 100.00% 0.08%				4 0.07%
H. squirella					7 100.00% 0.14%				7 0.12%

(Continued)

Table 2 (Continued)

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
Rana grylio				6	50		3		59
(adults)				10.17%	84.75%		5.08%		1.01%
				1.27%	0.99%	2.21%			
R. grylio		31		11		1			43
(larvae)		72.09%		25.58%		2.33%			0.74%
		46.27%		2.33%		2.94%			
R. utricularia				1	149		3		153
(adults)				0.65%	97.39%		1.96%		2.62%
				0.21%	2.95%		2.21%		
R. utricularia		23		10		3			36
(larvae)		63.89%		27.78%		8.33%			0.62%
		34.33%		2.11%		8.82%			
R. utricularia							5		5
(egg clutches)							100.00%		0.09%
							3.68%		
REPTILIA									
CROCODILIA									
Alligator	46	1			91		15		153
mississip-	30.07%	0.65%			59.48%		9.80%		2.62%
piensis	100.00%	1.49%			1.80%		11.03%		
A. mississip-							2		2
piensis							100.00%		0.03%
(egg clutches)							1.47%		

(Continued)

Table 2 (Continued)

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
TESTUDINATA									
Chelydra serpentina				1	2		1		4
				25.00%	50.00%		25.00%		0.07%
				0.21%	0.04%	0.74%			
Chrysemys floridana			1	2	341		3		347
			0.29%	0.58%	98.27%		0.86%		5.95%
			3.13%	0.42%	6.75%		2.21%		
C. nelsoni			2	1	95		2		100
			2.00%	1.00%	95.00%		2.00%		1.71%
			6.25%	0.21%	1.88%		1.47%		
Deirochelys reticularia					1				1
					100.00%				0.02%
					0.02%				
Kinosternon bauri		3		2	2		1		8
		37.50%		25.00%	25.00%		12.50%		0.14%
		4.48%		0.42%	0.04%		0.74%		
K. subrubrum			2	27	26				55
			3.64%	49.09%	47.27%				0.94%
			6.25%	5.71%	0.51%				
Sternotherus odoratus			20	27	1330	1	5		1383
			1.45%	1.95%	96.17%	0.07%	0.36%		23.70%
			62.50%	5.71%	26.31%	2.94%	3.68%		

(Continued)

Table 2 (Continued)

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
S. odoratus (egg clutches)					5 100.00% 0.10%				5 0.09%
Trionyx ferox				2 8.33% 0.42%	21 87.50% 0.42%		1 4.17% 0.74%		24 0.41%
SQUAMATA									
Coluber constrictor		1 50.00% 1.49%					1 50.00% 0.74%		2 0.03%
Farancia abacura				1 25.00% 0.21%	1 25.00% 0.02%		2 50.00% 1.48%		4 0.07%
Nerodia cyclopion			5 2.73% 15.63%	57 31.15% 12.05%	75 40.98% 1.48%		45 24.59% 33.09%	1* 0.55% 100.00%	183 3.14%
N. fasciata		1 4.00% 1.49%		1 4.00% 0.21%	18 72.00% 0.36%		5 20.00% 3.68%		25 0.43%

(Continued)

* Stomach of fish.

Table 2 (Concluded)

	Alligator Census	Drift Fence	Electro-fishing	Funnel Trap	Herp-patrol	Hyacinth Seining	Shoreline Census	Miscel-laneous	Species Total
Regina alleni							2 100.00% 1.47%		2 0.03%
Thamnophis sauritus		3 50.00% 4.48%					3 50.00% 2.21%		6 0.10%
T. sirtalis							2 100.00% 1.47%		2 0.03%
METHOD TOTALS	46 0.79%	67 1.15%	32 0.55%	473 8.10%	5045 86.50%	34 0.58%	136 2.33%	3 0.05%	5836 100.00%

Table 3

The distribution and relative abundance of amphibians and reptiles observed or captured on Lake Conway during the baseline study period. Pool summaries include the number of species by major taxonomic units (parentheses), the total number of individuals of a species recorded within a pool (raw values), and their relative abundance between pools (percentages).

	South Pool	Middle Pool	East Pool	West Pool	Lake Gatlin	Species Total
AMPHIBIA	(9)	(9)	(8)	(7)	(8)	(11)
CAUDATA	(2)	(2)	(3)	(2)	(2)	(3)
Amphiuma means	21 8.02%	14 5.34%	158 60.31%	62 23.66%	7 2.67%	262 4.49%
Eurycea quadridigitata	0	0	2 100%	0	0	2 0.03%
Siren lacertina	2 1.72%	20 17.24%	62 53.45%	26 22.41%	6 5.17%	116 1.99%
ANURA	(7)	(7)	(5)	(5)	(6)	(8)
Acris gryllus (adults)	508 61.13%	148 17.81%	135 16.25%	26 3.13%	14 1.68%	831 14.24%
A. gryllus (larvae)	0	1 100.00%	0	0	0	1 0.02%
Bufo terrestris (adults)	13 4.35%	33 11.04%	204 68.23%	24 8.03%	25 8.36%	299 5.12%
B. terrestris (larvae)	0	0	0	0	301 100.00%	301 5.16%

(Continued)

Table 3 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Lake Gatlin	Species Total
Gastrophryne carolinensis (adults)	5 6.41%	12 15.38%	0	57 73.08%	4 5.13%	78 1.34%
Hyla cinerea (adults)	47 3.57%	209 15.88%	448 34.04%	553 42.02%	59 4.48%	1316 22.55%
H. cinerea (larvae)	1 5.88%	0	14 82.35%	2 11.76%	0	17 0.29%
H. femoralis (adults)	0	4 100.00%	0	0	0	4 0.07%
H. squirella (adults)	7 100.00%	0	0	0	0	7 0.12%
Rana grylio (adults)	1 1.69%	38 64.41%	18 30.51%	0	2 3.39%	59 1.01%
R. grylio (larvae)	0	37 86.05%	6 13.95%	0	0	43 0.74%
R. utricularia (adults)	30 19.61%	15 9.80%	28 18.30%	50 32.68%	30 19.61%	153 2.62%
R. utricularia (larvae)	1 2.78%	28 77.78%	5 13.89%	2 5.56%	0	36 0.62%
R. utricularia (egg clutches)	1 20.00%	0	0	4 80.00%	0	5 0.09%

(Continued)

Table 3 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Lake Gatlin	Species Total
REPTILIA	(13)	(10)	(9)	(7)	(11)	(16)
CROCODILIA	(1)	(1)	(1)	(1)	(1)	(1)
Alligator mississippiensis	1 0.65%	72 47.06%	76 49.67%	2 1.31%	2 1.31%	153 2.62%
A. mississippiensis (egg clutches)	0	1 50.00%	1 50.00%	0	0	2 0.03%
TESTUDINATA	(6)	(6)	(5)	(5)	(8)	(8)
Chelydra serpentina	0	0	1 25.00%	1 25,00%	2 50.00%	4 0.07%
Chrysemys floridana	153 44.09%	79 22.77%	54 15.56%	4 1.15%	57 16.43%	347 5.95%
C. nelsoni	20 20.00%	31 31.00%	20 20.00%	3 3.00%	26 26.00%	100 1.71%
Deirochelys reticularia	0	0	0	0	1 100.00%	1 0.02%
Kinosternon bauri	6 75.00%	1 12.50%	0	0	1 12.50%	8 0.14%
K. subrubrum	38 69.09%	7 12.73%	0	1 1.82%	9 16.36%	55 0.94%
Sternotherus odoratus	453 32.75%	424 30.66%	89 6.44%	58 4.19%	359 25.96%	1383 24.70%

(Continued)

Table 3 (Concluded)

	South Pool	Middle Pool	East Pool	West Pool	Lake Gatlin	Species Total
S. odoratus (egg clutches)	0	4 80.00%	1 20.00%	0	0	5 0.09%
Trionyx ferox	8 33.33%	4 16.67%	4 16.67%	0	8 33.33%	24 0.41%
SQUAMATA	(6)	(3)	(3)	(1)	(2)	(7)
Coluber constrictor	2 100.00%	0	0	0	0	2 0.03%
Farancia abacura	3 75.00%	0	1 25.00%	0	0	4 0.07%
Nerodia cyclopion	101 55.19%	23 12.57%	26 14.21%	13 7.10%	20 10.93%	183 3.14%
N. fasciata	3 12.00%	8 32.00%	0	0	14 56.00%	25 0.43%
Regina alleni	2 100.00%	0	0	0	0	2 0.03%
Thamnophis sauritus	0	5 83.33%	1 16.67%	0	0	6 0.10%
T. sirtalis	2 100.00%	0	0	0	0	2 0.03%
POOL TOTALS	1429 24.49%	1218 20.84%	1354 23.22%	888 15.22%	947 16.24%	5836 100.00%

Table 4

The distribution and mean relative density of amphibians and reptiles at permanent shoreline sites on Lake Conway during the baseline study period. Site summaries include the number of species by major taxonomic units (parentheses), the total number of individuals of a species seen or captured by all methods (raw values), and their mean relative density as estimated by two methods: herp-patrols (H.P. = mean number/hour) and funnel traps (F.T.=mean number/100 trap days). Chi-square values (χ^2) are provided only if significant between-site differences were detected (*=P<.05, **=P<.01); site means with the same letter indicate no significant differences between sites (P>.025). See text for details.

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
Total herp-patrol hours	32.13	20.30	10.20	14.40	26.35	103.38	
Total trap days	928	422	434	614	420	2818	
AMPHIBIA	(8)	(8)	(7)	(7)	(8)	(10)	
CAUDATA	(2)	(2)	(3)	(2)	(2)	(3)	
Amphiuma means	21	14	143	62	7	247	
H.P.	0.0	0.0	0.0	0.07	0.0	0.01	
F.T.	2.26_A	2.83_A	30.41	9.45	1.67_A	8.16	371.10 **
Eurycea quadridigitata	0	0	2	0	0	2	
H.P.							
F.T.							
Siren lacertina	1	15	37	23	6	82	
H.P.	0	0.05	0.10	0.14	0.11	0.07	
F.T.	0.0	2.83_A	6.68	1.63_{AB}	0.71_B	1.91	76.01 **

(Continued)

Table 4 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
ANURA	(6)	(6)	(4)	(5)	(6)	(7)	
Acris gryllus (adults)	503	98	78	11	14	704	
H.P.	15.39_{A}	5.46_{ABC}	7.63_{AB}	0.0_{C}	0.57_{BC}	6.53	17.55 **
F.T.							
A. gryllus (larvae)	0	1	0	0	0	1	
H.P.							
F.T.	0.0	0.24	0.0	0.0	0.0	0.04	
Bufo terrestris (adults)	8	5	0	0	25	38	
H.P.	0.21	0.37	0.0	0.0	0.57	0.25	
F.T.							
B. terrestris (larvae)	0	0	0	0	1	1	
H.P.							
F.T.							
Gastrophryne carolinensis (adults)	5	8	0	57	4	74	
H.P.	0.11	0.60	0.0	3.14	0.13	0.69	
F.T.							
Hyla cinerea (adults)	37	134	383	538	59	1151	
H.P.	1.09	6.59	37.66	28.54	2.45	10.59	
F.T.							
H. cinerea (larvae)	1	0	14	2	0	17	
H.P.							
F.T.	0.0_{A}	0.0_{A}	2.07	0.16_{A}	0.0_{A}	0.35	43.24 **

(Continued)

Table 4 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
H. squirella	7	0	0	0	0	7	
H.P.	0.22	0.0	0.0	0.0	0.0	0.07	
F.T.							
Rana grylio (adults)	0	29	16	0	2	47	
H.P.	0.0	2.36	0.2	0.0	0.06	0.36	
F.T.	0.0_B	0.47_{AB}	0.92_A	0.0_B	0.0_{AB}	0.21	15.80 **
R. grylio (larvae)	0	37	6	0	0	43	
H.P.							
F.T.	0.0	1.18_{AB}	1.38_A	0.0	0.0_B	0.39	25.48 **
R. utricularia (adults)	30	14	27	50	30	151	
H.P.	0.82	0.79	3.08	1.58	1.05	1.17	
F.T.	0.0	0.0	0.0	0.16	0.0	0.04	
R. utricularia (larvae)	1	28	5	2	0	36	
H.P.							
F.T.	0.11_B	1.18_A	0.92_A	0.0_B	0.0_{AB}	0.35	17.39 **
R. utricularia (egg clutches)	1	0	0	4	0	5	
H.P.							
F.T.							
REPTILIA							
CROCODILIA		(1)	(1)			(1)	
Alligator mississippiensis	0	21	1	0	0	22	
H.P.	0.0	0.20	0.0	0.0	0.0	0.04	
F.T.							

(Continued)

Table 4 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
A. mississippiensis (egg clutches)	0	1	0	0	0	1	
H.P.							
F.T.							
TESTUDINATA	(6)	(6)	(5)	(5)	(8)	(8)	
Chelydra serpentina	0	0	1	1	2	4	
H.P.	0.0	0.0	0.0	0.0	0.08	0.02	
F.T.	0.0	0.0	0.23	0.0	0.0	0.04	
Chrysemys floridana	93	31	15	3	53	195	
H.P.	1.51_A	1.02_{AB}	0.95_{BC}	0.11_C	0.87_{AB}	1.12	21.31 **
F.T.	0.0	0.23	0.22	0.0	0.0	0.07	
C. nelsoni	12	8	3	2	26	51	
H.P.	0.14_B	0.25_{AB}	0.17_B	0.05_B	0.60_A	0.31	12.44 *
F.T.	0.11	0.0	0.0	0.0	0.0	0.4	
Deirochelys reticularia	0	0	0	0	1	1	
H.P.					0.04	0.01	
F.T.							
Kinosternon bauri	6	1	0	0	1	8	
H.P.	0.03	0.05	0.0	0.0	0.0	0.02	
F.T.	0.11	0.0	0.0	0.0	0.24	0.07	
K. subrubrum	38	2	0	1	7	48	
H.P.	0.14	0.0	0.0	0.0	0.06	0.09	
F.T.	2.55	0.45_A	0.0_A	0.0_A	0.23_A	0.94	39.85 **

(Continued)

Table 4 (Continued)

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
Sternotherus odoratus	340	294	44	54	308	1040	
H.P.	6.36_{AB}	8.85_{A}	6.40_{BC}	2.48_{C}	6.72_{A}	6.95	18.22 **
F.T.	1.18_{AB}	0.71_{ABC}	0.0_{C}	0.49_{BC}	2.38_{A}	0.94	15.38 **
S. odoratus (egg clutches)	0	0	2	0	1	3	
H.P.							
F.T.							
Trionyx ferox	8	1	2	0	7	18	
H.P.	0.19	0.05	0.20	0.0	0.14	0.11	
F.T.	0.11	0.0	0.0	0.0	0.0	0.04	
SQUAMATA	(6)	(3)	(2)	(1)	(2)	(7)	
Coluber constrictor	2	0	0	0	0	2	
H.P.							
F.T.							
Farancia abacura	3	0	0	0	0	3	
H.P.							
F.T.	0.11	0.0	0.0	0.0	0.0	0.04	
Nerodia cyclopion	98	10	20	13	19	160	
H.P.	0.30	0.0	0.29	0.32	0.40	0.37	
F.T.	2.48_{AC}	1.65_{AC}	3.46_{A}	0.16_{B}	0.95_{BC}	1.77	20.51 **
N. fasciata	3	2	0	0	14	19	
H.P.	0.0	0.05	0.0	0.0	0.38	0.11	
F.T.	0.0	0.0	0.0	0.0	0.24	0.04	

(Continued)

Table 4 (Concluded)

	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
Regina alleni	2	0	0	0	0	2	
H.P.							
F.T.							
Thamnophis sauritus	0	5	1	0	0	6	
H.P.							
F.T.							
T. sirtalis	2	0	0	0	0	2	
H.P.							
F.T.							
POOL TOTALS	1222	758	800	823	587	4191	

Table 5

Comparison of the mean relative density (number calling/hour) of the five most common species of frogs encountered on herp-patrols at permanent shoreline sites on Lake Conway during the baseline study period. Only the breeding seasons are included in the analysis (April 1978-September 1978 for all species except *Rana utricularia*, which called from December 1977-June 1978). Chi-square values (χ^2) are provided only if significant between-site differences were detected (*=P<.05, **=P<.01); site means with the same letter were not significantly different (P>.025).

Species	South Pool	Middle Pool	East Pool	West Pool	Gatlin Canal	Species Total	χ^2
Acris gryllus	29.15_A	10.83_{AB}	14.63_A	0.00_B	1.10_B	11.14	25.76**
Gastrophryne carolinensis	0.23	1.21	0.00	6.27	0.26	1.59	
Hyla cinerea	2.18_B	13.15_B	72.18_A	57.02_A	4.70_B	29.85	23.75**
Rana grylio	0.00_B	2.42_A	2.30_{AB}	0.00_B	0.08_B	0.96	11.68*
R. utricularia	1.31	1.06	4.92	2.10	1.54	2.19	

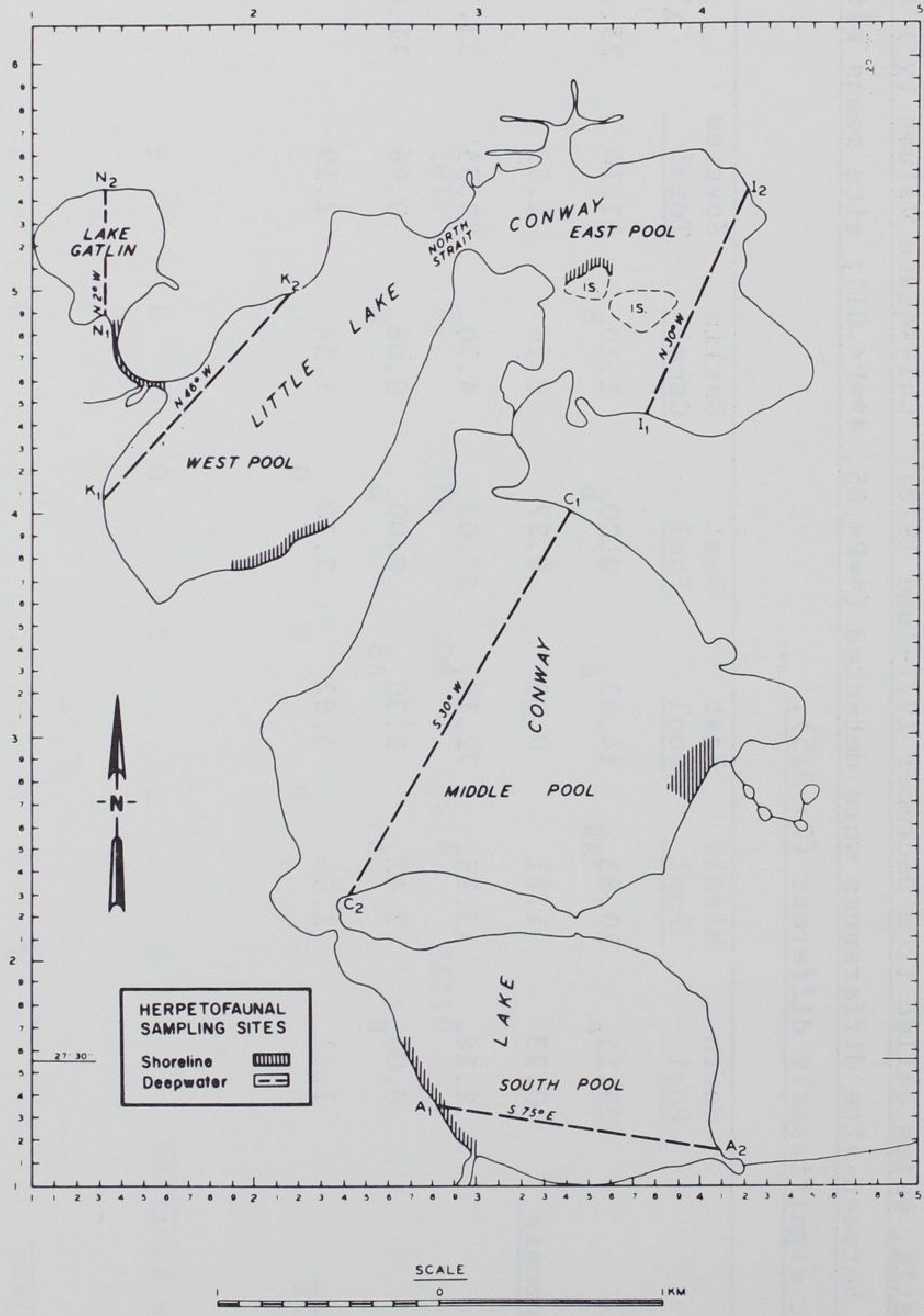

Figure 1. Permanent sampling sites for amphibians and reptiles on Lake Conway

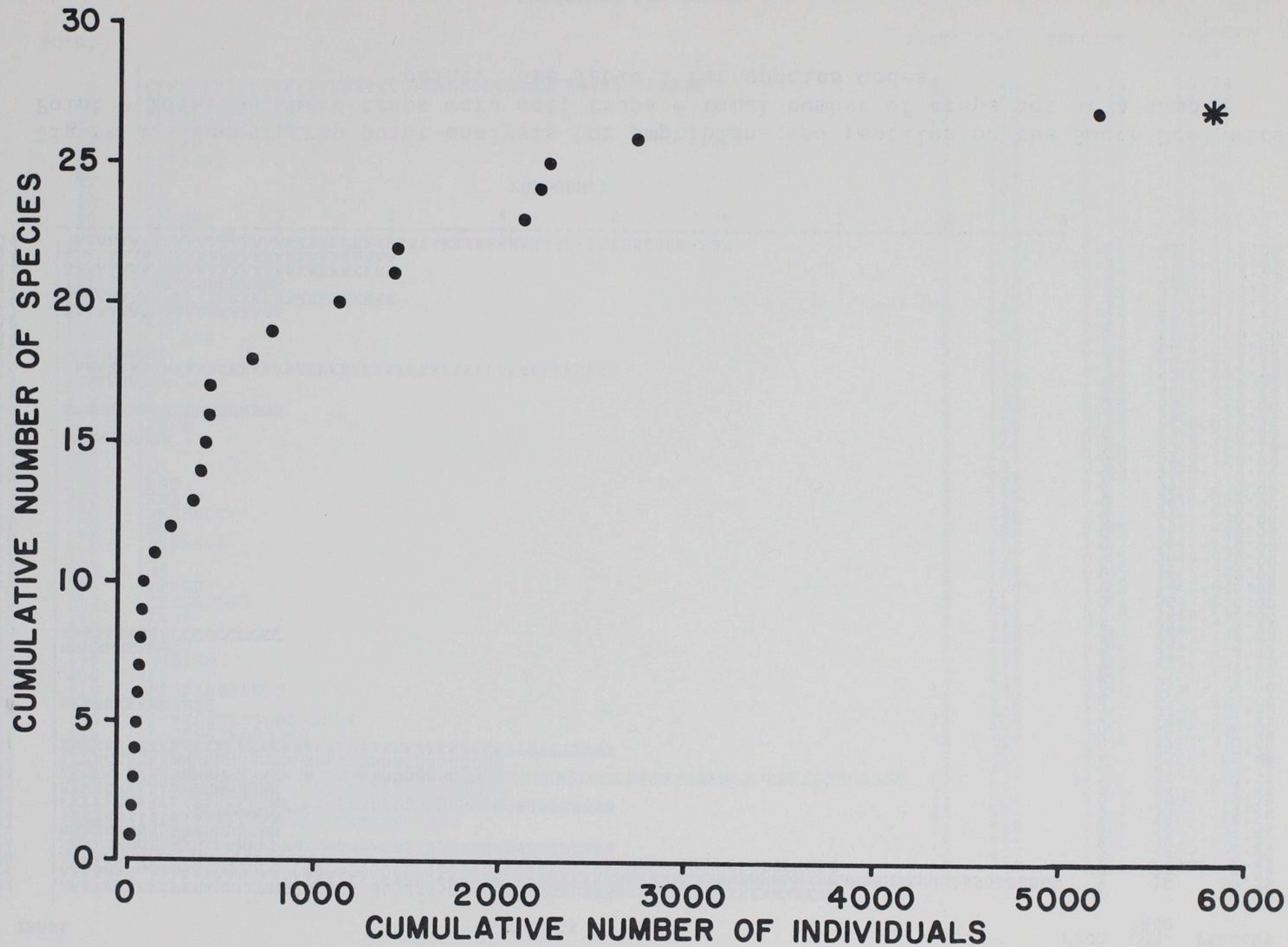

Figure 2. The cumulative number of amphibian and reptile species as a function of the cumulative number of individuals recorded on Lake Conway. Asterick indicates last individual collected during the baseline study period

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                                        FREQUENCY BAR CHART

POINT  TRAPS                                                                                  FREQ  CUM.   PERCENT    CUM.
                                                                                                    FREQ             PERCENT
              |
  0    24     |KKKKKKKKKKNNNNNNNNNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSXXXXXXXXXX                 7      7     8.24      8.24
 10    24     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAKKKKKKKKKKKKKKKKKKKKNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNSSSSSSSSSS 9     16    10.59     18.82
 20    24     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNNNNNNNSSSSSSSSSS                     7     23     8.24     27.06
 30    24     |NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS                                         5     28     5.88     32.94
 40    24     |NNNNNNNNNNNNNNNNNNNN                                                                       2     30     2.35     35.29
 50    24     |$$$$$$$$$$AAAAAAAAAA                                                                       2     32     2.35     37.65
 60    24     |KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKNNNNNNNNNNSSSSSSSSSS                                         5     37     5.88     43.53
 70    24     |KKKKKKKKKKNNNNNNNNNN                                                                       2     39     2.35     45.88
 80    24     |KKKKKKKKKKNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN                                                   4     43     4.71     50.59
 90    24     |KKKKKKKKKKNNNNNNNNNNNNNNNNNNNNSSSSSSSSSS                                                   4     47     4.71     55.29
100    24     |KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKTTTTTTTTTT                                         5     52     5.88     61.18
110    24     |                                                                                           0     52     0.00     61.18
120    24     |                                                                                           0     52     0.00     61.18
130    20     |KKKKKKKKKK                                                                                 1     53     1.18     62.35
140    20     |                                                                                           0     53     0.00     62.35
150    20     |                                                                                           0     53     0.00     62.35
160    20     |                                                                                           0     53     0.00     62.35
170    20     |NNNNNNNNNN                                                                                 1     54     1.18     63.53
180    18     |&&&&&&&&&&CCCCCCCCCC                                                                       2     56     2.35     65.88
190    18     |                                                                                           0     56     0.00     65.88
200    18     |                                                                                           0     56     0.00     65.88
210    18     |                                                                                           0     56     0.00     65.88
220    18     |                                                                                           0     56     0.00     65.88
230    18     |                                                                                           0     56     0.00     65.88
240    18     |                                                                                           0     56     0.00     65.88
250    19     |                                                                                           0     56     0.00     65.88
260    19     |                                                                                           0     56     0.00     65.88
270    19     |                                                                                           0     56     0.00     65.88
280    19     |                                                                                           0     56     0.00     65.88
290    19     |                                                                                           0     56     0.00     65.88
300    19     |                                                                                           0     56     0.00     65.88
310    19     |                                                                                           0     56     0.00     65.88
320    19     |NNNNNNNNNN                                                                                 1     57     1.18     67.06
330    19     |                                                                                           0     57     0.00     67.06
340    19     |NNNNNNNNNNNNNNNNNNNN                                                                       2     59     2.35     69.41
350    19     |                                                                                           0     59     0.00     69.41
360    19     |AAAAAAAAAA                                                                                 1     60     1.18     70.59
370    19     |AAAAAAAAAAKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK                                         5     65     5.88     76.47
380    18     |NNNNNNNNNN                                                                                 1     66     1.18     77.65
390    18     |                                                                                           0     66     0.00     77.65
400    18     |                                                                                           0     66     0.00     77.65
410    17     |AAAAAAAAAAAAAAAAAAAA                                                                       2     68     2.35     80.00
420    15     |AAAAAAAAAAKKKKKKKKKKKKKKKKKKKK                                                             3     71     3.53     83.53
430    15     |IIIIIIIIIINNNNNNNNNN                                                                       2     73     2.35     85.88
440    14     |AAAAAAAAAAAAAAAAAAAAKKKKKKKKKK                                                             3     76     3.53     89.41
450    14     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                             3     79     3.53     92.94
460    14     |AAAAAAAAAAAAAAAAAAAAKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKSSSSSSSSSS                               6     85     7.06    100.00
              ----------+---------+---------+---------+---------+---------+---------+---------+---------+
                        1         2         3         4         5         6         7         8         9

                                                  FREQUENCY
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Figure 3. Funnel trap point analysis for amphibians and reptiles on the South Pool site. Point = location where traps were set; traps = total number of traps set at a sample point. See Table 1 for species codes

FREQUENCY BAR CHART

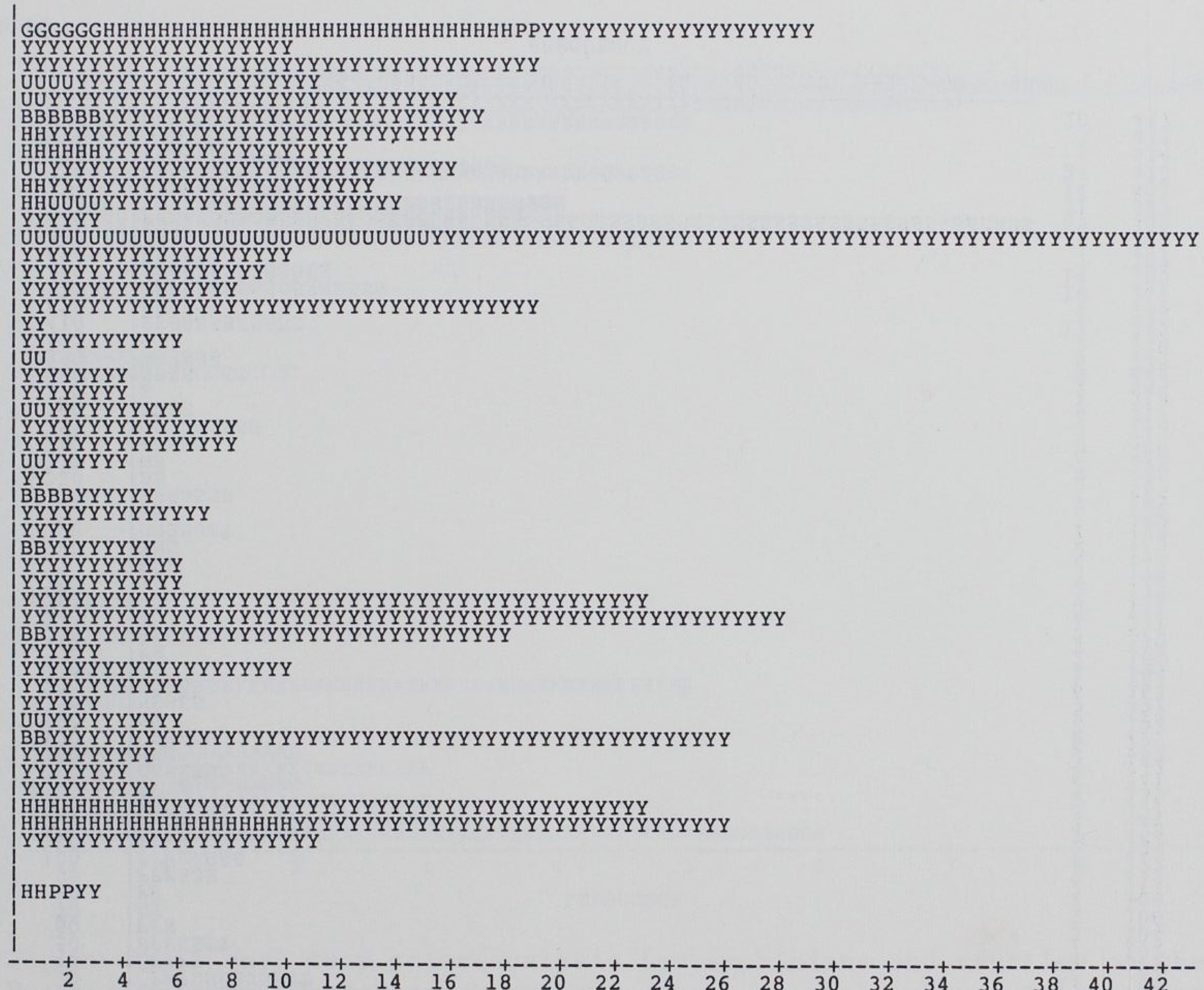
POINT		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	CFFFFFFFFFFFFFFFFFFFFNNSSSSSSSSSSSSSSSSSSSSSSSSS	48	48	10.74	10.74
10	CFFFFSSSSSSSSSS	15	63	3.36	14.09
20	FFFFSSSSSSSSS	13	76	2.91	17.00
30	CFFFNSSSSSSTT	13	89	2.91	19.91
40	CFFFF	5	94	1.12	21.03
50	FFFKSST	7	101	1.57	22.60
60	FFK	3	104	0.67	23.27
70	ST	2	106	0.45	23.71
80	FF	2	108	0.45	24.16
90	FFFSSS	6	114	1.34	25.50
100	FFFFSSSS	8	122	1.79	27.29
110	FS	2	124	0.45	27.74
120	FSSS	4	128	0.89	28.64
130	NSS	3	131	0.67	29.31
140	FFIS	4	135	0.89	30.20
150	CNSSSS	6	141	1.34	31.54
160	KKS	3	144	0.67	32.21
170	CFFSSS	6	150	1.34	33.56
180	ST	2	152	0.45	34.00
190	NSSSS	5	157	1.12	35.12
200	FSSSSS	6	163	1.34	36.47
210	S	1	164	0.22	36.69
220	KN	2	166	0.45	37.14
230	FSSS	4	170	0.89	38.03
240	S	1	171	0.22	38.26
250		0	171	0.00	38.26
260	NS	2	173	0.45	38.70
270	KSS	3	176	0.67	39.37
280	NNS	3	179	0.67	40.04
290	NNSSSST	7	186	1.57	41.61
300	SS	2	188	0.45	42.06
310	SSSSSSS	7	195	1.57	43.62
320	SS	2	197	0.45	44.07
330	NS	2	199	0.45	44.52
340	FFNSS	5	204	1.12	45.64
350	CFSSSSSSS	9	213	2.01	47.65
360	FKSS	4	217	0.89	48.55
370	S	1	218	0.22	48.77
380	SSSS	4	222	0.89	49.66
390	NNSSSS	6	228	1.34	51.01
400	SS	2	230	0.45	51.45
410	SSSSSSSSSSSS	12	242	2.68	54.14
420	NSSSSS	6	248	1.34	55.48
430	CFFKSSSSSSSSSSSSSS	18	266	4.03	59.51
440	SSSSSSSSSSSSSS	14	280	3.13	62.64
450	KSSSSSS	7	287	1.57	64.21
460	SSSS	4	291	0.89	65.10
470	FFKKSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	65	356	14.54	79.64
480	FFFFFFFSSSSSSSSSSSSSSSSSSSSSSSS	31	387	6.94	86.58
490	FFFFSSSSSSSSSS	14	401	3.13	89.71
500	FFFFFKSSSSSSSSSSSSSSSSSSSSS	27	428	6.04	95.75
510	SSSSSS	6	434	1.34	97.09
520	CFS	3	437	0.67	97.76
530	CFFFFSSSST	10	447	2.24	100.00

5 10 15 20 25 30 35 40 45 50 55 60 65

FREQUENCY

Figure 4. Herp-patrol analysis for salamanders and reptiles on the South Pool site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART



POINT	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	29	29	5.38	5.38
10	10	39	1.86	7.24
20	19	58	3.53	10.76
30	11	69	2.04	12.80
40	16	85	2.97	15.77
50	17	102	3.15	18.92
60	16	118	2.97	21.89
70	12	130	2.23	24.12
80	16	146	2.97	27.09
90	13	159	2.41	29.50
100	14	173	2.60	32.10
110	3	176	0.56	32.65
120	43	219	7.98	40.63
130	10	229	1.86	42.49
140	9	238	1.67	44.16
150	8	246	1.48	45.64
160	19	265	3.53	49.17
170	1	266	0.19	49.35
180	6	272	1.11	50.46
190	1	273	0.19	50.65
200	4	277	0.74	51.39
210	4	281	0.74	52.13
220	6	287	1.11	53.25
230	8	295	1.48	54.73
240	8	303	1.48	56.22
250	4	307	0.74	56.96
260	1	308	0.19	57.14
270	5	313	0.93	58.07
280	7	320	1.30	59.37
290	2	322	0.37	59.74
300	5	327	0.93	60.67
310	6	333	1.11	61.78
320	6	339	1.11	62.89
330	23	362	4.27	67.16
340	28	390	5.19	72.36
350	18	408	3.34	75.70
360	3	411	0.56	76.25
370	10	421	1.86	78.11
380	6	427	1.11	79.22
390	3	430	0.56	79.78
400	6	436	1.11	80.89
410	26	462	4.82	85.71
420	5	467	0.93	86.64
430	4	471	0.74	87.38
440	5	476	0.93	88.31
450	23	499	4.27	92.58
460	26	525	4.82	97.40
470	11	536	2.04	99.44
480	0	536	0.00	99.44
490	0	536	0.00	99.44
500	3	539	0.56	100.00
510	0	539	0.00	100.00
520	0	539	0.00	100.00
530	0	539	0.00	100.00

Figure 5. Herp-patrol point analysis for calling frogs on the South Pool site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

```
                                        FREQUENCY BAR CHART

TRIP      TRAPS                                                                                  FREQ   CUM.   PERCENT    CUM.
                                                                                                        FREQ              PERCENT
                    |
21 JUL 77  13       |KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNSSSSSSSSSS   15     15    17.65     17.65
18 AUG 77  13       |AAAAANNNNN                                                                   2     17     2.35     20.00
26 AUG 77  13       |AAAAAKKKKKNNNNNNNNNNNNNNNNNNNN                                               6     23     7.06     27.06
24 SEP 77  13       |KKKKKKKKKKKKKKKKKKKKKKKKKNNNNNNNNNNNNNNNNNNNNSSSSSXXXXX                     11     34    12.94     40.00
13 OCT 77  13       |                                                                             0     34     0.00     40.00
17 NOV 77  18       |AAAAAAAAAA                                                                   2     36     2.35     42.35
15 DEC 77  18       |KKKKKKKKKK                                                                   2     38     2.35     44.71
13 JAN 78  44       |AAAAA                                                                        1     39     1.18     45.88
29 JAN 78  44       |                                                                             0     39     0.00     45.88
14 FEB 78  42       |AAAAAKKKKK                                                                   2     41     2.35     48.24
28 FEB 78  42       |AAAAAKKKKKKKKKKKKKKK                                                         4     45     4.71     52.94
21 MAR 78  47       |AAAAAAAAAAAAAAAAAAAAAAAAANNNNN                                               6     51     7.06     60.00
28 MAR 78  47       |                                                                             0     51     0.00     60.00
11 APR 78  47       |NNNNN                                                                        1     52     1.18     61.18
25 APR 78  46       |                                                                             0     52     0.00     61.18
 5 MAY 78  47       |AAAAACCCCC                                                                   2     54     2.35     63.53
22 MAY 78  47       |                                                                             0     54     0.00     63.53
20 JUN 78  47       |KKKKKKKKKKNNNNN                                                              3     57     3.53     67.06
28 JUN 78  47       |KKKKK                                                                        1     58     1.18     68.24
11 JUL 78  47       |AAAAAAAAAANNNNN                                                              3     61     3.53     71.76
28 JUL 78  47       |AAAAAAAAAAIIIIINNNNNNNNNN                                                    5     66     5.88     77.65
16 AUG 78  47       |AAAAAAAAAASSSSS                                                              3     69     3.53     81.18
31 AUG 78  47       |&&&&&AAAAAKKKKKSSSSSSSSSSSSSSSSSSSSTTTTT                                     8     77     9.41     90.59
14 SEP 78  47       |$$$$$KKKKKNNNNNSSSSSSSSSS                                                    5     82     5.88     96.47
30 SEP 78  47       |AAAAANNNNNSSSSS                                                              3     85     3.53    100.00
                    -----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
                         1    2    3    4    5    6    7    8    9   10   11   12   13   14   15

                                             FREQUENCY
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Figure 6. Funnel trap trip analysis for amphibians and reptiles on the South Pool site. Trip = date of trapping; traps = total number of traps set on a date. See Table 1 for species codes

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                                       FREQUENCY BAR CHART

TRIP      MINUTES                                                                              FREQ  CUM.   PERCENT    CUM.
                                                                                                     FREQ             PERCENT
                  |
21 JUL 77         |CFFFFFFKNSSSSSSSSSSSSSSSSS                                                   26    26     5.79      5.79
18 AUG 77         |FFFFFFFKKSSSSSSSSSSSSSSSSSSS                                                 28    54     6.24     12.03
25 AUG 77         |CFFFFFFFFKSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                       38    92     8.46     20.49
 1 SEP 77         |FFFFKSSSSSSSSSSSSSSSS                                                        21   113     4.68     25.17
23 SEP 77         |CCFFFFFFFFSSSSSSSSSSSSSSSSSST                                                29   142     6.46     31.63
13 OCT 77   29    |FSSSSSSSSSSSS                                                                13   155     2.90     34.52
27 OCT 77   93    |FFKNSSSSSSSSSSSSSSSSSSSSSSSSSS                                               30   185     6.68     41.20
10 NOV 77  104    |CFFFFKKSSSSSSSSSSSSSSSSSSSSS                                                 28   213     6.24     47.44
17 NOV 77  187    |CCFFFFFFFFFFFKKKNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS 74   287    16.48     63.92
15 DEC 77   55    |FSSSSSSSS                                                                     9   296     2.00     65.92
29 DEC 77   72    |FFFFSSSSS                                                                     9   305     2.00     67.93
11 JAN 78   49    |F                                                                             1   306     0.22     68.15
29 JAN 78   95    |SS                                                                            2   308     0.45     68.60
13 FEB 78   85    |CFSSSSSSSS                                                                   10   318     2.23     70.82
27 FEB 78   61    |FFSSSS                                                                        6   324     1.34     72.16
20 MAR 78   80    |CFSSSSSSSS                                                                   10   334     2.23     74.39
27 MAR 78   71    |NS                                                                            2   336     0.45     74.83
10 APR 78   92    |FFFSSSSS                                                                      8   344     1.78     76.61
23 APR 78   52    |                                                                              0   344     0.00     76.61
 4 MAY 78   96    |CFFNNNSSSSSSSSS                                                              15   359     3.34     79.96
22 MAY 78   54    |T                                                                             1   360     0.22     80.18
20 JUN 78   79    |FFFFFSSSSSSSSSSSSSS                                                          19   379     4.23     84.41
26 JUN 78   57    |FSSSTT                                                                        6   385     1.34     85.75
 9 JUL 78   88    |FFIKSSSSSSSSSSSSSSSSSSSSSS                                                   26   411     5.79     91.54
26 JUL 78   70    |FSSSST                                                                        6   417     1.34     92.87
15 AUG 78   88    |FFFSSSSSS                                                                     9   426     2.00     94.88
30 AUG 78   86    |FFFFFFSSSSSST                                                                13   439     2.90     97.77
12 SEP 78  114    |FFFSSST                                                                       7   446     1.56     99.33
28 SEP 78   71    |SSS                                                                           3   449     0.67    100.00
                  ----+----+----+----+----+----+----+----+----+----+----+----+----+----+----
                      5   10   15   20   25   30   35   40   45   50   55   60   65   70

                                          FREQUENCY
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Figure 7. Herp-patrol trip analysis for salamanders and reptiles on the South Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

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                                          FREQUENCY BAR CHART

TRIP        MINUTES                                                                                            FREQ   CUM.    PERCENT     CUM.
                                                                                                                      FREQ               PERCENT
                      |
21 JUL 77             |                                                                                          0       0      0.00      0.00
18 AUG 77             |                                                                                          0       0      0.00      0.00
25 AUG 77             |                                                                                          0       0      0.00      0.00
 1 SEP 77             |                                                                                          0       0      0.00      0.00
23 SEP 77             |                                                                                          0       0      0.00      0.00
13 OCT 77   29        |                                                                                          0       0      0.00      0.00
27 OCT 77   93        |                                                                                          0       0      0.00      0.00
10 NOV 77  104        |U                                                                                         1       1      0.17      0.17
17 NOV 77  187        |U                                                                                         2       3      0.34      0.52
15 DEC 77   55        |                                                                                          0       3      0.00      0.52
29 DEC 77   72        |                                                                                          0       3      0.00      0.52
11 JAN 78   49        |                                                                                          0       3      0.00      0.52
29 JAN 78   95        |                                                                                          0       3      0.00      0.52
13 FEB 78   85        |U                                                                                         1       4      0.17      0.69
27 FEB 78   61        |UY                                                                                        3       7      0.52      1.21
20 MAR 78   80        |UY                                                                                        2       9      0.34      1.55
27 MAR 78   71        |UUUUUUUUYYYYYYYYYY                                                                       35      44      6.03      7.59
10 APR 78   92        |UUYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY                                                   75     119     12.93     20.52
23 APR 78   52        |YYYY                                                                                      8     127      1.38     21.90
 4 MAY 78   96        |BBBBGPPPUYYYYY                                                                           25     152      4.31     26.21
22 MAY 78   54        |HPYYYYY                                                                                  11     163      1.90     28.10
20 JUN 78   79        |HYY                                                                                       4     167      0.69     28.79
26 JUN 78   57        |GPY                                                                                       5     172      0.86     29.66
 9 JUL 78   88        |HHHHHHHYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY                                                   76     248     13.10     42.76
26 JUL 78   70        |HHYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY                      132     380     22.76     65.52
15 AUG 78   88        |HHHHYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY                                   105     485     18.10     83.62
30 AUG 78   86        |HHYYYYYYYYYYYYYYYYYYYYYYYYYYYYY                                                          61     546     10.52     94.14
12 SEP 78  114        |HYYYYYYYYYYYYYYY                                                                         31     577      5.34     99.48
28 SEP 78   71        |YY                                                                                        3     580      0.52    100.00
                      -----+----+----+----+----+----+----+----+----+----+----+----+----+-
                          10   20   30   40   50   60   70   80   90  100  110  120  130

                                                  FREQUENCY
```

Figure 8. Herp-patrol trip analysis for calling frogs on the South Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

```
                         FREQUENCY BAR CHART

POINT                                                                   FREQ   CUM.    PERCENT     CUM.
                                                                               FREQ               PERCENT
       |
 1000  |KKKKKKKKKKKKKKKKKKKK                                              1       1       4.17       4.17
 1010  |NNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS                          2       3       8.33      12.50
 1020  |KKKKKKKKKKKKKKKKKKKKSSSSSSSSSSSSSSSSSSSS                          2       5       8.33      20.83
 1030  |                                                                  0       5       0.00      20.83
 1040  |                                                                  0       5       0.00      20.83
 1050  |                                                                  0       5       0.00      20.83
 1060  |                                                                  0       5       0.00      20.83
 1070  |                                                                  0       5       0.00      20.83
 1080  |                                                                  0       5       0.00      20.83
 1090  |                                                                  0       5       0.00      20.83
 1100  |++++++++++++++++++++LLLLLLLLLLLLLLLLLLLL                          2       7       8.33      29.17
 1110  |AAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLLNNNNNNNNNNNNNNNNNNNN      3      10      12.50      41.67
 1120  |AAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLL                          2      12       8.33      50.00
 1130  |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                          2      14       8.33      58.33
 1140  |&&&&&&&&&&&&&&&&&&&&LLLLLLLLLLLLLLLLLLLLNNNNNNNNNNNNNNNNNNNN      3      17      12.50      70.83
 1150  |AAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLL                          2      19       8.33      79.17
 1160  |                                                                  0      19       0.00      79.17
 1170  |NNNNNNNNNNNNNNNNNNNN                                              1      20       4.17      83.33
 1180  |LLLLLLLLLLLLLLLLLLLL                                              1      21       4.17      87.50
 1190  |LLLLLLLLLLLLLLLLLLLL                                              1      22       4.17      91.67
 1200  |AAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLL                          2      24       8.33     100.00
       --------------------+--------------------+--------------------+
                           1                    2                    3

                                FREQUENCY
```

Figure 9. Funnel trap point analysis for amphibians and reptiles on the Middle Pool site before 25 April 1978. Point = location where traps were set. Total number of traps set before 25 April 1978 was 230. See Table 1 for species codes

```
                                      FREQUENCY BAR CHART

POINT                                                                          FREQ  CUM.   PERCENT    CUM.
                                                                                     FREQ              PERCENT
      |
1000  |                                                                         0     0      0.00       0.00
1010  |                                                                         0     0      0.00       0.00
1020  |                                                                         0     0      0.00       0.00
1030  |                                                                         0     0      0.00       0.00
1040  |                                                                         0     0      0.00       0.00
1050  |&&&&&&&&&&                                                               1     1      4.00       4.00
1060  |                                                                         0     1      0.00       4.00
1070  |                                                                         0     1      0.00       4.00
1080  |                                                                         0     1      0.00       4.00
1090  |                                                                         0     1      0.00       4.00
1100  |                                                                         0     1      0.00       4.00
1110  |                                                                         0     1      0.00       4.00
1120  |                                                                         0     1      0.00       4.00
1130  |&&&&&&&&&&&&&&&&&&&&                                                     2     3      8.00      12.00
1140  |++++++++++NNNNNNNNNNSSSSSSSSSS                                           3     6     12.00      24.00
1150  |++++++++++++++++++++++++++++++&&&&&&&&&&AAAAAAAAAAAAAAAAAAAAAAAAAAAAAARRRRRRRRRR   8    14     32.00      56.00
1160  |LLLLLLLLLLNNNNNNNNNN                                                     2    16      8.00      64.00
1170  |AAAAAAAAAALLLLLLLLLLRRRRRRRRRR                                           3    19     12.00      76.00
1180  |AAAAAAAAAA                                                               1    20      4.00      80.00
1190  |**********AAAAAAAAAAFFFFFFFFFFLLLLLLLLLLNNNNNNNNNN                       5    25     20.00     100.00
1200  |                                                                         0    25      0.00     100.00
      ----------+---------+---------+---------+---------+---------+---------+---------+
                1         2         3         4         5         6         7         8

                                      FREQUENCY
```

Figure 10. Funnel trap point analysis for amphibians and reptiles on the Middle Pool site after 25 April 1978. Point = location where traps were set. Total number of traps set after 25 April 1978 was 192. See Table 1 for species codes

```
                                              FREQUENCY BAR CHART

POINT                                                                                          FREQ   CUM.     PERCENT      CUM.
                                                                                                      FREQ               PERCENT
       |
2000   |                                                                                         0      0        0.00        0.00
2010   |SSSSSSSSSSSSSSSSSSSS                                                                     4      4        3.85        3.85
2020   |SSSSSSSSSSSSSSSSSSSSSSSSS                                                                5      9        4.81        8.65
2030   |SSSSSSSSSSSSSSSSSSSS                                                                     4     13        3.85       12.50
2040   |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                           6     19        5.77       18.27
2050   |CCCCCSSSSSSSSSSSSSSS                                                                     4     23        3.85       22.12
2060   |CCCCCCCCCCFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS      16     39       15.38       37.50
2070   |CCCCCFFFFFFFFFFFFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS            14     53       13.46       50.96
2080   |FFFFFIIIIISSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                 8     61        7.69       58.65
2090   |FFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                      7     68        6.73       65.38
2100   |SSSSSSSSSSSSSSSSSSSS                                                                     4     72        3.85       69.23
2110   |FFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSWWWWW                                                 8     80        7.69       76.92
2120   |CCCCCSSSSSSSSSSSSSSS                                                                     4     84        3.85       80.77
2130   |FFFFFFFFFFFFFFFSSSSSSSSSS                                                                5     89        4.81       85.58
2140   |CCCCCSSSSSSSSSSSSSSS                                                                     4     93        3.85       89.42
2150   |SSSSSSSSSSSSSSSSSSSSSSSSS                                                                5     98        4.81       94.23
2160   |FFFFFSSSSS                                                                               2    100        1.92       96.15
2170   |FFFFFSSSSSSSSSSSSSSS                                                                     4    104        3.85      100.00
2180   |                                                                                         0    104        0.00      100.00
2190   |                                                                                         0    104        0.00      100.00
2200   |                                                                                         0    104        0.00      100.00
       -----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
            1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16

                                             FREQUENCY
```

Figure 11. Herp-patrol point analysis of salamanders and reptiles on the Middle Pool site (2000 series) before 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT                                                                FREQ  CUM.   PERCENT    CUM.
                                                                           FREQ              PERCENT
       |
 2000  |                                                                0     0      0.00       0.00
 2010  |                                                                0     0      0.00       0.00
 2020  |CCCCCCCCCC                                                      1     1      6.67       6.67
 2030  |SSSSSSSSSS                                                      1     2      6.67      13.33
 2040  |LLLLLLLLLL                                                      1     3      6.67      20.00
 2050  |                                                                0     3      0.00      20.00
 2060  |                                                                0     3      0.00      20.00
 2070  |                                                                0     3      0.00      20.00
 2080  |                                                                0     3      0.00      20.00
 2090  |                                                                0     3      0.00      20.00
 2100  |                                                                0     3      0.00      20.00
 2110  |                                                                0     3      0.00      20.00
 2120  |SSSSSSSSSS                                                      1     4      6.67      26.67
 2130  |FFFFFFFFFFSSSSSSSSSS                                            2     6     13.33      40.00
 2140  |SSSSSSSSSS                                                      1     7      6.67      46.67
 2150  |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS              5    12     33.33      80.00
 2160  |FFFFFFFFFFSSSSSSSSSS                                            2    14     13.33      93.33
 2170  |                                                                0    14      0.00      93.33
 2180  |SSSSSSSSSS                                                      1    15      6.67     100.00
 2190  |                                                                0    15      0.00     100.00
 2200  |                                                                0    15      0.00     100.00
        ----------+---------+---------+---------+---------+
                  1         2         3         4         5

                              FREQUENCY
```

Figure 12. Herp-patrol point analysis of salamanders and reptiles on the Middle Pool site (2000 series) after 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

POINT                                                                                                    FREQ  CUM.   PERCENT    CUM.
                                                                                                               FREQ             PERCENT
      |
3000  |SSSSSSSSSS                                                                                           5     5     2.79     2.79
3010  |NNSSSSSSSS                                                                                           5    10     2.79     5.59
3020  |NNSSSSSSSSSSSSSSSS                                                                                   9    19     5.03    10.61
3030  |SSSSSSSSSSSSSSSSSSSS                                                                                10    29     5.59    16.20
3040  |FF                                                                                                   1    30     0.56    16.76
3050  |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                  25    55    13.97    30.73
3060  |FFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                          21    76    11.73    42.46
3070  |FFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS          44   120    24.58    67.04
3080  |FFSSSSSSSSSSSSSSSSSSSS                                                                              11   131     6.15    73.18
3090  |FFSSSSSSSS                                                                                           5   136     2.79    75.98
3100  |                                                                                                     0   136     0.00    75.98
3110  |NNSSSSSSSSSSSSSSSS                                                                                   9   145     5.03    81.01
3120  |SS                                                                                                   1   146     0.56    81.56
3130  |                                                                                                     0   146     0.00    81.56
3140  |FFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                                  17   163     9.50    91.06
3150  |FFSSSSSSSS                                                                                           5   168     2.79    93.85
3160  |SSSS                                                                                                 2   170     1.12    94.97
3170  |SSSSSSSSSSSSSS                                                                                       7   177     3.91    98.88
3180  |SSSS                                                                                                 2   179     1.12   100.00
3190  |                                                                                                     0   179     0.00   100.00
3200  |                                                                                                     0   179     0.00   100.00
      ----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
          2   4   6   8  10  12  14  16  18  20  22  24  26  28  30  32  34  36  38  40  42  44

                                        FREQUENCY
```

Figure 13. Herp-patrol point analysis of salamanders and reptiles on the Middle Pool site (3000 series) before 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

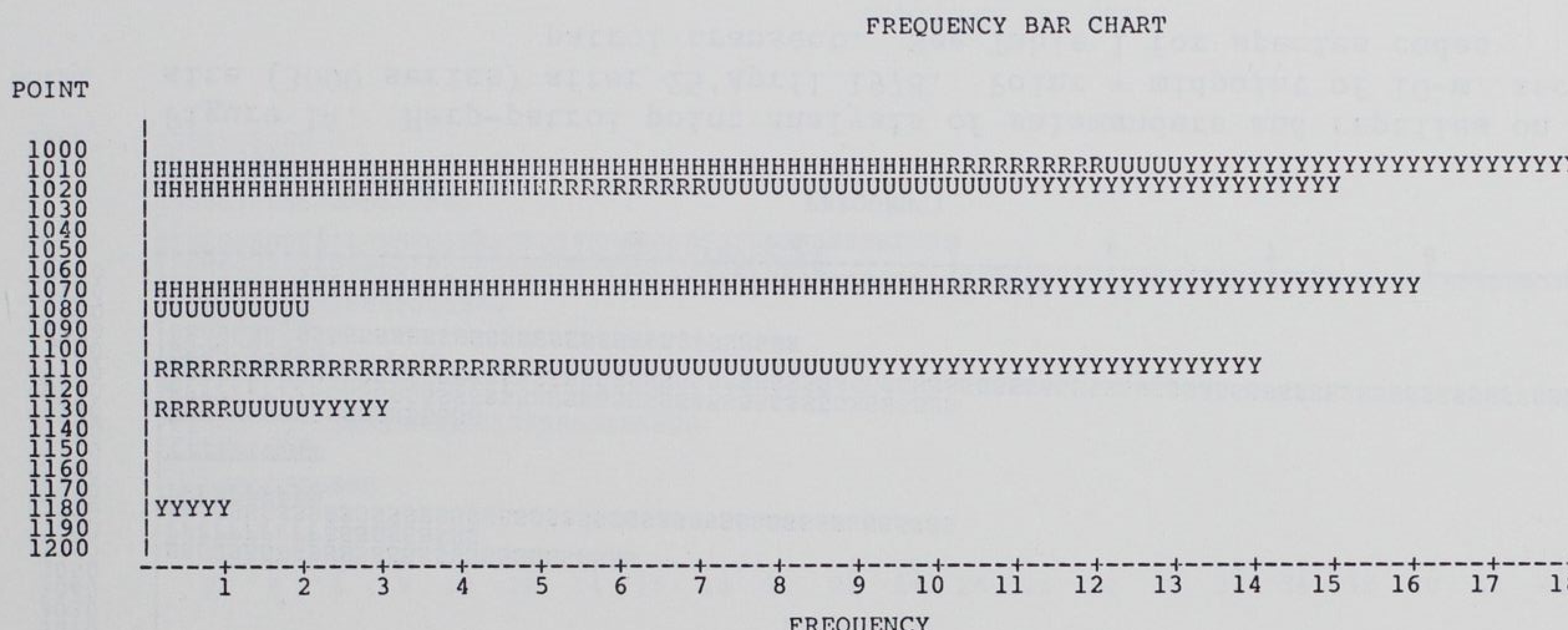
FREQUENCY BAR CHART

POINT		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
3000	SSSSSSSSSS	1	1	2.94	2.94
3010		0	1	0.00	2.94
3020		0	1	0.00	2.94
3030		0	1	0.00	2.94
3040		0	1	0.00	2.94
3050		0	1	0.00	2.94
3060	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	3	4	8.82	11.76
3070	FFFFFFFFFFSSSSSSSSSS	2	6	5.88	17.65
3080	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	5	11	14.71	32.35
3090	FFFFFFFFFF	1	12	2.94	35.29
3100		0	12	0.00	35.29
3110	TTTTTTTTTT	1	13	2.94	38.24
3120		0	13	0.00	38.24
3130	FFFFFFFFFFSSSSSSSSSS	2	15	5.88	44.12
3140	FFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	5	20	14.71	58.82
3150	FFFFFFFFFFFFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	9	29	26.47	85.29
3160	SSSSSSSSSS	1	30	2.94	88.24
3170	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	4	34	11.76	100.00
3180		0	34	0.00	100.00
3190		0	34	0.00	100.00
3200		0	34	0.00	100.00

1 2 3 4 5 6 7 8 9

FREQUENCY

Figure 14. Herp-patrol point analysis of salamanders and reptiles on the Middle Pool site (3000 series) after 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes



POINT	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
1000	0	0	0.00	0.00
1010	18	18	26.09	26.09
1020	15	33	21.74	47.83
1030	0	33	0.00	47.83
1040	0	33	0.00	47.83
1050	0	33	0.00	47.83
1060	0	33	0.00	47.83
1070	16	49	23.19	71.01
1080	2	51	2.90	73.91
1090	0	51	0.00	73.91
1100	0	51	0.00	73.91
1110	14	65	20.29	94.20
1120	0	65	0.00	94.20
1130	3	68	4.35	98.55
1140	0	68	0.00	98.55
1150	0	68	0.00	98.55
1160	0	68	0.00	98.55
1170	0	68	0.00	98.55
1180	1	69	1.45	100.00
1190	0	69	0.00	100.00
1200	0	69	0.00	100.00

Figure 15. Herp-patrol point analysis of calling frogs on the Middle Pool site (1000 series) before 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT                                                                                    FREQ  CUM.   PERCENT    CUM.
                                                                                               FREQ             PERCENT
        |
 1000   |                                                                                  0      0      0.00      0.00
 1010   |                                                                                  0      0      0.00      0.00
 1020   |                                                                                  0      0      0.00      0.00
 1030   |                                                                                  0      0      0.00      0.00
 1040   |Y                                                                                 1      1      0.50      0.50
 1050   |                                                                                  0      1      0.00      0.50
 1060   |YY                                                                                4      5      2.01      2.51
 1070   |YY                                                                                3      8      1.51      4.02
 1080   |                                                                                  0      8      0.00      4.02
 1090   |                                                                                  0      8      0.00      4.02
 1100   |BBB                                                                               5     13      2.51      6.53
 1110   |                                                                                  0     13      0.00      6.53
 1120   |YY                                                                                4     17      2.01      8.54
 1130   |RU                                                                                3     20      1.51     10.05
 1140   |HRUYYY                                                                           10     30      5.03     15.08
 1150   |GGHHHRYYYY                                                                       18     48      9.05     24.12
 1160   |RYYY                                                                              8     56      4.02     28.14
 1170   |GHHRYYY                                                                          12     68      6.03     34.17
 1180   |YYY                                                                               5     73      2.51     36.68
 1190   |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHRRYYYYYYYYYYYYYYYY                126    199     63.32    100.00
 1200   |                                                                                  0    199      0.00    100.00
        -----+----+----+----+----+----+----+----+----+----+----+----+---
            10   20   30   40   50   60   70   80   90  100  110  120

                                  FREQUENCY
```

Figure 16. Herp-patrol point analysis of calling frogs on the Middle Pool site (1000 series) after 25 April 1978. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

```
                                FREQUENCY BAR CHART

TRIP       TRAPS                                                                FREQ  CUM.   PERCENT    CUM.
                                                                                      FREQ              PERCENT
                    |
11 AUG 77   14      |NNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS                    2      2    15.38     15.38
 8 SEP 77   14      |                                                            0      2     0.00     15.38
20 SEP 77   12      |LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL3      5    23.08     38.46
18 NOV 77   14      |SSSSSSSSSSSSSSSSSSSS                                        1      6     7.69     46.15
15 DEC 77   14      |                                                            0      6     0.00     46.15
29 DEC 77   14      |                                                            0      6     0.00     46.15
11 JAN 78   14      |                                                            0      6     0.00     46.15
30 JAN 78   14      |                                                            0      6     0.00     46.15
13 FEB 78   20      |                                                            0      6     0.00     46.15
27 FEB 78   21      |                                                            0      6     0.00     46.15
20 MAR 78   20      |AAAAAAAAAAAAAAAAAAAA                                        1      7     7.69     53.85
28 MAR 78   20      |NNNNNNNNNNNNNNNNNNNN                                        1      8     7.69     61.54
10 APR 78   20      |++++++++++++++++++++AAAAAAAAAAAAAAAAAAAAKKKKKKKKKKKKKKKKKKKK3     11    23.08     84.62
23 APR 78   20      |KKKKKKKKKKKKKKKKKKKK                                        1     12     7.69     92.31
 4 MAY 78   15      |                                                            0     12     0.00     92.31
22 MAY 78   15      |                                                            0     12     0.00     92.31
20 JUN 78   21      |                                                            0     12     0.00     92.31
26 JUN 78   20      |                                                            0     12     0.00     92.31
 9 JUL 78   20      |                                                            0     12     0.00     92.31
27 JUL 78   20      |                                                            0     12     0.00     92.31
15 AUG 78   20      |                                                            0     12     0.00     92.31
 1 SEP 78   20      |&&&&&&&&&&&&&&&&&&&&                                        1     13     7.69    100.00
14 SEP 78   20      |                                                            0     13     0.00    100.00
30 SEP 78   20      |                                                            0     13     0.00    100.00
                    --------------------+-------------------+-------------------+
                                        1                   2                   3

                                     FREQUENCY
```

Figure 17. Funnel trap trip analysis of amphibians and reptiles on the disturbed section of the Middle Pool site (1000 series, markers 1000-1120). Trip = date of trapping; traps = total number of traps set on a date for the entire site (only 302 of 422 total traps were set on disturbed section during the baseline study period). See Table 1 for species codes

```
                                        FREQUENCY BAR CHART

TRIP        TRAPS                                                                   FREQ   CUM.   PERCENT     CUM.
                                                                                           FREQ             PERCENT
                     |
11 AUG 77    14      |                                                                0      0      0.00      0.00
 8 SEP 77    14      |                                                                0      0      0.00      0.00
20 SEP 77    12      |AAAAAAAAAA                                                      1      1      2.94      2.94
18 NOV 77    14      |                                                                0      1      0.00      2.94
15 DEC 77    14      |                                                                0      1      0.00      2.94
29 DEC 77    14      |                                                                0      1      0.00      2.94
11 JAN 78    14      |                                                                0      1      0.00      2.94
30 JAN 78    14      |                                                                0      1      0.00      2.94
13 FEB 78    20      |                                                                0      1      0.00      2.94
27 FEB 78    21      |                                                                0      1      0.00      2.94
20 MAR 78    20      |&&&&&&&&&&                                                      1      2      2.94      5.88
28 MAR 78    20      |LLLLLLLLLLNNNNNNNNNNNNNNNNNNNN                                  3      5      8.82     14.71
10 APR 78    20      |AAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLLLLLLLLLLLL              5     10     14.71     29.41
23 APR 78    20      |                                                                0     10      0.00     29.41
 4 MAY 78    15      |AAAAAAAAAALLLLLLLLLL                                            2     12      5.88     35.29
22 MAY 78    15      |&&&&&&&&&&SSSSSSSSSS                                            2     14      5.88     41.18
20 JUN 78    21      |                                                                0     14      0.00     41.18
26 JUN 78    20      |AAAAAAAAAA                                                      1     15      2.94     44.12
 9 JUL 78    20      |++++++++++**********AAAAAAAAAA                                  3     18      8.82     52.94
27 JUL 78    20      |NNNNNNNNNNNNNNNNNNNNNNNNNNNNNN                                  3     21      8.82     61.76
15 AUG 78    20      |FFFFFFFFFF                                                      1     22      2.94     64.71
 1 SEP 78    20      |++++++++++&&&&&&&&&&&&&&&&&&&&AAAAAAAAAAAAAAAAAAAALLLLLLLLLL    6     28     17.65     82.35
14 SEP 78    20      |LLLLLLLLLLRRRRRRRRRRRRRRRRRRRR                                  3     31      8.82     91.18
30 SEP 78    20      |++++++++++++++++++++AAAAAAAAAA                                  3     34      8.82    100.00
                     ----------+---------+---------+---------+---------+---------+
                               1         2         3         4         5         6
                                                 FREQUENCY
```

Figure 18. Funnel trap trip analysis of amphibians and reptiles on the undisturbed section of the Middle Pool site (1000 series, markers 1120-1200). Trip = date of trapping; traps = total number of traps set on a date for the entire site (only 192 of 422 total traps were set on the undisturbed section during the baseline study period). See Table 1 for species codes

```
                                FREQUENCY BAR CHART

TRIP      MINUTES                                                              FREQ  CUM.   PERCENT    CUM.
                                                                                     FREQ            PERCENT
                 |
11 AUG 77        |                                                               0     0     0.00      0.00
 8 SEP 77        |FFFFFFSSSSSSSS                                                 7     7     8.33      8.33
29 SEP 77        |SSSSSSSSSS                                                     5    12     5.95     14.29
13 OCT 77   33   |SSSS                                                           2    14     2.38     16.67
27 OCT 77   80   |SSSSSSSSSS                                                     5    19     5.95     22.62
16 NOV 77  133   |CCCCSSSSSSSSSSSSSS                                             9    28    10.71     33.33
 7 DEC 77   82   |CCFFFFFFIISSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS  30    58    35.71     69.05
15 DEC 77   54   |CCSSSSSSSS                                                     5    63     5.95     75.00
29 DEC 77   76   |SSSS                                                           2    65     2.38     77.38
11 JAN 78   63   |FFSS                                                           2    67     2.38     79.76
30 JAN 78   33   |                                                               0    67     0.00     79.76
13 FEB 78   53   |FFSSSSSSSSSSSS                                                 7    74     8.33     88.10
27 FEB 78   37   |                                                               0    74     0.00     88.10
20 MAR 78   64   |SSSSSSSS                                                       4    78     4.76     92.86
28 MAR 78   44   |SS                                                             1    79     1.19     94.05
10 APR 78   40   |                                                               0    79     0.00     94.05
23 APR 78   47   |SSWW                                                           2    81     2.38     96.43
 8 MAY 78   19   |                                                               0    81     0.00     96.43
22 MAY 78   45   |                                                               0    81     0.00     96.43
20 JUN 78   50   |CC                                                             1    82     1.19     97.62
26 JUN 78   33   |                                                               0    82     0.00     97.62
 9 JUL 78   43   |SS                                                             1    83     1.19     98.81
27 JUL 78   34   |                                                               0    83     0.00     98.81
16 AUG 78   36   |                                                               0    83     0.00     98.81
30 AUG 78   34   |                                                               0    83     0.00     98.81
13 SEP 78   49   |                                                               0    83     0.00     98.81
28 SEP 78   35   |LL                                                             1    84     1.19    100.00
                 ----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
                     2   4   6   8  10  12  14  16  18  20  22  24  26  28  30

                                    FREQUENCY
```

Figure 19. Herp-patrol trip analysis of salamanders and reptiles on the disturbed section of the Middle Pool site (2000 series, markers 2000-2120). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

TRIP        MINUTES                                                   FREQ  CUM.   PERCENT    CUM.
                                                                            FREQ             PERCENT
                    |
11 AUG 77           |                                                   0     0     0.00      0.00
 8 SEP 77           |                                                   0     0     0.00      0.00
29 SEP 77           |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSS                     3     3     8.57      8.57
13 OCT 77    33     |FFFFFFFFFF                                         1     4     2.86     11.43
27 OCT 77    80     |SSSSSSSSSS                                         1     5     2.86     14.29
16 NOV 77   133     |SSSSSSSSSS                                         1     6     2.86     17.14
 7 DEC 77    82     |                                                   0     6     0.00     17.14
15 DEC 77    54     |SSSSSSSSSSSSSSSSSSSS                               2     8     5.71     22.86
29 DEC 77    76     |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS 5    13    14.29     37.14
11 JAN 78    63     |CCCCCCCCCCSSSSSSSSSS                               2    15     5.71     42.86
30 JAN 78    33     |SSSSSSSSSS                                         1    16     2.86     45.71
13 FEB 78    53     |CCCCCCCCCCSSSSSSSSSS                               2    18     5.71     51.43
27 FEB 78    37     |                                                   0    18     0.00     51.43
20 MAR 78    64     |FFFFFFFFFF                                         1    19     2.86     54.29
28 MAR 78    44     |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS           4    23    11.43     65.71
10 APR 78    40     |                                                   0    23     0.00     65.71
23 APR 78    47     |                                                   0    23     0.00     65.71
 8 MAY 78    19     |SSSSSSSSSS                                         1    24     2.86     68.57
22 MAY 78    45     |SSSSSSSSSS                                         1    25     2.86     71.43
20 JUN 78    50     |                                                   0    25     0.00     71.43
26 JUN 78    33     |                                                   0    25     0.00     71.43
 9 JUL 78    43     |SSSSSSSSSSSSSSSSSSSS                               2    27     5.71     77.14
27 JUL 78    34     |                                                   0    27     0.00     77.14
16 AUG 78    36     |                                                   0    27     0.00     77.14
30 AUG 78    34     |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                     3    30     8.57     85.71
13 SEP 78    49     |SSSSSSSSSS                                         1    31     2.86     88.57
28 SEP 78    35     |FFFFFFFFFFFFFFFFFFFFSSSSSSSSSSSSSSSSSSSS           4    35    11.43    100.00
                     ---------+---------+---------+---------+---------+
                              1         2         3         4         5

                                        FREQUENCY
```

Figure 20. Herp-patrol trip analysis of salamanders and reptiles on the undisturbed section of the Middle Pool site (2000 series, markers 2121-2200). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

TRIP	MINUTES	FREQUENCY	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
11 AUG 77		NNSSSSSSSSSSSS	7	7	4.40	4.40
8 SEP 77		FFNNNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	18	25	11.32	15.72
29 SEP 77		SSSSSSSSSSSSSSSSSSSSSSSSSS	13	38	8.18	23.90
13 OCT 77	33		0	38	0.00	23.90
27 OCT 77	80	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	15	53	9.43	33.33
16 NOV 77	133	FFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	26	79	16.35	49.69
7 DEC 77	82	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	41	120	25.79	75.47
15 DEC 77	54	FF	1	121	0.63	76.10
29 DEC 77	76	FFSSSSSSSS	5	126	3.14	79.25
11 JAN 78	63	SSSSSSSSSS	5	131	3.14	82.39
30 JAN 78	33	SSSSSSSSSS	5	136	3.14	85.53
13 FEB 78	53	SSSSSSSSSSSSSSSS	8	144	5.03	90.57
27 FEB 78	37		0	144	0.00	90.57
20 MAR 78	64		0	144	0.00	90.57
28 MAR 78	44		0	144	0.00	90.57
10 APR 78	40	SS	1	145	0.63	91.19
23 APR 78	47	SS	1	146	0.63	91.82
8 MAY 78	19		0	146	0.00	91.82
22 MAY 78	45		0	146	0.00	91.82
20 JUN 78	50	FFSSSSSSSSSSSSSSSS	9	155	5.66	97.48
26 JUN 78	33		0	155	0.00	97.48
9 JUL 78	43	SS	1	156	0.63	98.11
27 JUL 78	34	SS	1	157	0.63	98.74
16 AUG 78	36		0	157	0.00	98.74
30 AUG 78	34		0	157	0.00	98.74
13 SEP 78	49	FFTT	2	159	1.26	100.00
28 SEP 78	35		0	159	0.00	100.00

Frequency axis: 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

FREQUENCY

Figure 21. Herp-patrol trip analysis of salamanders and reptiles on the disturbed section of the Middle Pool site (3000 series, markers 3000-3120). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
TRIP        MINUTES                                                              FREQ  CUM.   PERCENT    CUM.
                                                                                       FREQ             PERCENT
                    |
11 AUG 77           |                                                              0     0      0.00      0.00
 8 SEP 77           |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                           7     7     12.96     12.96
29 SEP 77           |FFFFFSSSSSSSSSSSSSSSSSSSS                                     5    12      9.26     22.22
13 OCT 77    33     |                                                              0    12      0.00     22.22
27 OCT 77    80     |SSSSSSSSSS                                                    2    14      3.70     25.93
16 NOV 77   133     |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                      8    22     14.81     40.74
 7 DEC 77    82     |FFFFFSSSSSSSSSS                                               3    25      5.56     46.30
15 DEC 77    54     |SSSSS                                                         1    26      1.85     48.15
29 DEC 77    76     |                                                              0    26      0.00     48.15
11 JAN 78    63     |                                                              0    26      0.00     48.15
30 JAN 78    33     |                                                              0    26      0.00     48.15
13 FEB 78    53     |                                                              0    26      0.00     48.15
27 FEB 78    37     |                                                              0    26      0.00     48.15
20 MAR 78    64     |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                           7    33     12.96     61.11
28 MAR 78    44     |                                                              0    33      0.00     61.11
10 APR 78    40     |                                                              0    33      0.00     61.11
23 APR 78    47     |                                                              0    33      0.00     61.11
 8 MAY 78    19     |                                                              0    33      0.00     61.11
22 MAY 78    45     |SSSSS                                                         1    34      1.85     62.96
20 JUN 78    50     |SSSSS                                                         1    35      1.85     64.81
26 JUN 78    33     |                                                              0    35      0.00     64.81
 9 JUL 78    43     |FFFFFFFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                 9    44     16.67     81.48
27 JUL 78    34     |                                                              0    44      0.00     81.48
16 AUG 78    36     |                                                              0    44      0.00     81.48
30 AUG 78    34     |SSSSSSSSSSSSSSS                                               3    47      5.56     87.04
13 SEP 78    49     |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                6    53     11.11     98.15
28 SEP 78    35     |FFFFF                                                         1    54      1.85    100.00
                    -----+----+----+----+----+----+----+----+----+
                         1    2    3    4    5    6    7    8    9

                                      FREQUENCY
```

Figure 22. Herp-patrol trip analysis of salamanders and reptiles on the undisturbed section of the Middle Pool site (3000 series, markers 3121-3200). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

TRIP       MINUTES                                                                      FREQ   CUM.    PERCENT      CUM.
                                                                                               FREQ              PERCENT
                   |
11 AUG 77          |                                                                      0      0       0.00       0.00
 8 SEP 77          |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHRRRRYYYYYYYYYYYYYYYYYYYYYY     33     33      38.37      38.37
29 SEP 77          |HHHHHHHHHHYYYYYYYY                                                    9     42      10.47      48.84
13 OCT 77    33    |                                                                      0     42       0.00      48.84
27 OCT 77    80    |                                                                      0     42       0.00      48.84
16 NOV 77   133    |                                                                      0     42       0.00      48.84
 7 DEC 77    82    |                                                                      0     42       0.00      48.84
15 DEC 77    54    |                                                                      0     42       0.00      48.84
29 DEC 77    76    |                                                                      0     42       0.00      48.84
11 JAN 78    63    |UU                                                                    1     43       1.16      50.00
30 JAN 78    33    |                                                                      0     43       0.00      50.00
13 FEB 78    53    |                                                                      0     43       0.00      50.00
27 FEB 78    37    |UUUUUU                                                                3     46       3.49      53.49
20 MAR 78    64    |                                                                      0     46       0.00      53.49
28 MAR 78    44    |RRRRUUUUUU                                                            5     51       5.81      59.30
10 APR 78    40    |RR                                                                    1     52       1.16      60.47
23 APR 78    47    |RRRRRRRRUUUUUUUUYYYYYYYYYY                                           13     65      15.12      75.58
 8 MAY 78    19    |                                                                      0     65       0.00      75.58
22 MAY 78    45    |                                                                      0     65       0.00      75.58
20 JUN 78    50    |                                                                      0     65       0.00      75.58
26 JUN 78    33    |                                                                      0     65       0.00      75.58
 9 JUL 78    43    |                                                                      0     65       0.00      75.58
27 JUL 78    34    |BBBBBBBBBBEEEE                                                        7     72       8.14      83.72
16 AUG 78    36    |                                                                      0     72       0.00      83.72
30 AUG 78    34    |EEYYYYYYYYYYYYYYYYYYYYYYYY                                           13     85      15.12      98.84
13 SEP 78    49    |EE                                                                    1     86       1.16     100.00
28 SEP 78    35    |                                                                      0     86       0.00     100.00
                   ----+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+--
                       2   4   6   8  10  12  14  16  18  20  22  24  26  28  30  32

                                       FREQUENCY
```

Figure 23. Herp-patrol trip analysis of calling frogs on the disturbed section of the Middle Pool site (1000 series, markers 1000-1120). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
TRIP        MINUTES                                                                                           FREQ   CUM.    PERCENT    CUM.
                                                                                                                     FREQ               PERCENT
                      |
 11 AUG 77            |                                                                                          0      0     0.00      0.00
  8 SEP 77            |                                                                                          0      0     0.00      0.00
 29 SEP 77            |                                                                                          0      0     0.00      0.00
 13 OCT 77   33       |                                                                                          0      0     0.00      0.00
 27 OCT 77   80       |                                                                                          0      0     0.00      0.00
 16 NOV 77  133       |                                                                                          0      0     0.00      0.00
  7 DEC 77   82       |                                                                                          0      0     0.00      0.00
 15 DEC 77   54       |                                                                                          0      0     0.00      0.00
 29 DEC 77   76       |                                                                                          0      0     0.00      0.00
 11 JAN 78   63       |                                                                                          0      0     0.00      0.00
 30 JAN 78   33       |                                                                                          0      0     0.00      0.00
 13 FEB 78   53       |                                                                                          0      0     0.00      0.00
 27 FEB 78   37       |                                                                                          0      0     0.00      0.00
 20 MAR 78   64       |ERUY                                                                                      4      4     2.14      2.14
 28 MAR 78   44       |                                                                                          0      4     0.00      2.14
 10 APR 78   40       |Y                                                                                         1      5     0.53      2.67
 23 APR 78   47       |                                                                                          0      5     0.00      2.67
  8 MAY 78   19       |                                                                                          0      5     0.00      2.67
 22 MAY 78   45       |                                                                                          0      5     0.00      2.67
 20 JUN 78   50       |HHR                                                                                       4      9     2.14      4.81
 26 JUN 78   33       |GGHHHRYY                                                                                 14     23     7.49     12.30
  9 JUL 78   43       |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHRRYYYYYYYYYYYYYYY                          124    147    66.31     78.61
 27 JUL 78   34       |R                                                                                         2    149     1.07     79.68
 16 AUG 78   36       |UYYYYYYYYYYYYYYY                                                                         31    180    16.58     96.26
 30 AUG 78   34       |GHR                                                                                       3    183     1.60     97.86
 13 SEP 78   49       |RRU                                                                                       4    187     2.14    100.00
 28 SEP 78   35       |                                                                                          0    187     0.00    100.00
                      -----+----+----+----+----+----+----+----+----+----+----+----+--
                          10   20   30   40   50   60   70   80   90  100  110  120
                                                  FREQUENCY
```

Figure 24. Herp-patrol trip analysis of calling frogs on the undisturbed section of the Middle Pool site (1000 series, markers 1121-1200). Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT TRAPS                                                                                                  FREQ   CUM.   PERCENT    CUM.
                                                                                                                    FREQ              PERCENT
                  |
1010   23         |&&&&&AAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLL                                                    8      8      4.47      4.47
1020   23         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLNNNNN                                                    8     16      4.47      8.94
1030   22         |$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLL                                               9     25      5.03     13.97
1040   22         |AAAAAAAAAAAAAAALLLLLLLLLLLLLLLNNNNNNNNNNNNNNN                                               9     34      5.03     18.99
1050   23         |&&&&&AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                                         7     41      3.91     22.91
1060   23         |AAAAAAAAAAAAAAAAAAAANNNNNNNNNNNNNNN                                                         7     48      3.91     26.82
1070   23         |&&&&&AAAAAAAAAAAAAAAAAAAAAAAAANNNNN                                                         7     55      3.91     30.73
1080   23         |AAAAAAAAAAAAAAAAAAAAAAAAA                                                                   5     60      2.79     33.52
1090   23         |+++++AAAAAAAAAAAAAAAAAAAA                                                                   5     65      2.79     36.31
1100   23         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNN                                                         7     72      3.91     40.22
1110   23         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLNNNNN                                               9     81      5.03     45.25
1120   23         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFFFFFLLLLLLLLLL                          12     93      6.70     51.96
1130   23         |AAAAAAAAAAAAAAAAAAAAAAAAALLLLL                                                              6     99      3.35     55.31
1140   20         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLNNNNNNNNNNRRRRR                                    11    110      6.15     61.45
1150   20         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLLLLLLLRRRRR                          13    123      7.26     68.72
1160   20         |+++++$$$$$$$$$$$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLOOOOORRRRR          16    139      8.94     77.65
1170   20         |$$$$$$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLL                                    11    150      6.15     83.80
1180   20         |AAAAAAAAAAAAAAAAAAAAAAAAALLLLL                                                              6    156      3.35     87.15
1190   20         |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLL          16    172      8.94     96.09
1200   17         |AAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLL                                                         7    179      3.91    100.00
                  -----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
                       1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16

                                                  FREQUENCY
```

Figure 25. Funnel trap point analysis of amphibians and reptiles on the East Pool site. Point = location where traps were set; traps = total number of traps set at a sample point. See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT                                                                                      FREQ  CUM.   PERCENT    CUM.
                                                                                                FREQ            PERCENT
        |
2010    |NNNNNNNNNN                                                                           1     1     1.64      1.64
2020    |                                                                                     0     1     0.00      1.64
2030    |SSSSSSSSSS                                                                           1     2     1.64      3.28
2040    |NNNNNNNNNN                                                                           1     3     1.64      4.92
2050    |                                                                                     0     3     0.00      4.92
2060    |CCCCCCCCCCSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                         6     9     9.84     14.75
2070    |SSSSSSSSSS                                                                           1    10     1.64     16.39
2080    |FFFFFFFFFFSSSSSSSSSS                                                                 2    12     3.28     19.67
2090    |                                                                                     0    12     0.00     19.67
2100    |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSTTTTTTTTTT                                             4    16     6.56     26.23
2110    |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS               7    23    11.48     37.70
2120    |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                         6    29     9.84     47.54
2130    |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                   5    34     8.20     55.74
2140    |SSSSSSSSSSSSSSSSSSSS                                                                 2    36     3.28     59.02
2150    |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                         6    42     9.84     68.85
2160    |FFFFFFFFFFSSSSSSSSSSSSSSSSSSSS                                                       3    45     4.92     73.77
2170    |CCCCCCCCCCFFFFFFFFFFFFFFFFFFFFLLLLLLLLLLNNNNNNNNNNSSSSSSSSSSTTTTTTTTTT               7    52    11.48     85.25
2180    |FFFFFFFFFFFFFFFFFFFFSSSSSSSSSSSSSSSSSSSS                                             4    56     6.56     91.80
2190    |FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF                                                       3    59     4.92     96.72
2200    |FFFFFFFFFFSSSSSSSSSS                                                                 2    61     3.28    100.00
        ----------+---------+---------+---------+---------+---------+---------+
                  1         2         3         4         5         6         7

                                    FREQUENCY
```

Figure 26. Herp-patrol point analysis of salamanders and reptiles on the East Pool site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

```
                                        FREQUENCY BAR CHART

POINT                                                                                           FREQ   CUM.     PERCENT     CUM.
                                                                                                       FREQ               PERCENT
        |
1010    |HHHHHHHHHHHHHHHRUUUYYYYYYYYYYYYYYYY                                                     35     35        8.56       8.56
1020    |HHHHHYYYYYYYY                                                                           13     48        3.18      11.74
1030    |HHHYYY                                                                                   6     54        1.47      13.20
1040    |HY                                                                                       2     56        0.49      13.69
1050    |HHHYYY                                                                                   6     62        1.47      15.16
1060    |HHHHHHYYYYY                                                                             11     73        2.69      17.85
1070    |HHHHHHHH                                                                                 8     81        1.96      19.80
1080    |HHHHHHHYYYY                                                                             11     92        2.69      22.49
1090    |HHHY                                                                                     4     96        0.98      23.47
1100    |HHHHHHHHHHHYY                                                                           13    109        3.18      26.65
1110    |HHHHHHHHHHHHHHHHH                                                                       17    126        4.16      30.81
1120    |HHHHHHHHHHHHHHHHHHHH                                                                    20    146        4.89      35.70
1130    |HHHHHHHHHHHHHHHHH                                                                       17    163        4.16      39.85
1140    |HHHHHHHHHHHHHRRYYYY                                                                     19    182        4.65      44.50
1150    |HHHHHHHHHHHHHHHHHHHHRUYYYYY                                                             27    209        6.60      51.10
1160    |HHHHHHHHHHHHHHHHHHHHHHHHHHHHUUYYYY                                                      34    243        8.31      59.41
1170    |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHRYYYYYYYYYYY        80    323       19.56      78.97
1180    |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHRY                                                   37    360        9.05      88.02
1190    |HHHHHHHHHHHHHHHHHHHHHRUUUYY                                                             27    387        6.60      94.62
1200    |HHHHHHHHHHHHHHHHHHHHHH                                                                  22    409        5.38     100.00
        -----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
             5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80

                                           FREQUENCY
```

Figure 27. Herp-patrol point analysis of calling frogs on the East Pool site Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

TRIP	TRAPS		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
18 AUG 77	13	AAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLLLLLLLNNNNNNNNNNNNNNN	13	13	7.26	7.26
22 SEP 77	13	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNNNNNNNNNNNN	9	22	5.03	12.29
27 OCT 77	13	AAAAAAAAAALLLLL	3	25	1.68	13.97
7 DEC 77	20	AAAAALLLLL	2	27	1.12	15.08
23 DEC 77	20	LLLLLLLLLLLLLLLLLLLLLLLLL	5	32	2.79	17.88
11 JAN 78	20	LLLLL	1	33	0.56	18.44
30 JAN 78	18		0	33	0.00	18.44
15 FEB 78	20		0	33	0.00	18.44
28 FEB 78	20	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	6	39	3.35	21.79
22 MAR 78	20	AAAAAAAAAAAAAAAAAAAAAAAAA	5	44	2.79	24.58
29 MAR 78	20	AAAAAAAAAAAAAAA	3	47	1.68	26.26
12 APR 78	20	AAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLNNNNN	8	55	4.47	30.73
25 APR 78	20	AAAAAAAAAALLLLLLLLLLLLLLLNNNNNNNNNN	7	62	3.91	34.64
9 MAY 78	19	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLNNNNN	16	78	8.94	43.58
23 MAY 78	19	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLL	12	90	6.70	50.28
20 JUN 78	19	AAAAAAAAAAAAAAAAAAAALLLLLLLLLL	6	96	3.35	53.63
27 JUN 78	20	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAOOOOORRRRR	12	108	6.70	60.34
10 JUL 78	20	$$$$$$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNN	15	123	8.38	68.72
27 JUL 78	20	&&&&&&&&&&$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	12	135	6.70	75.42
15 AUG 78	20	+++++$$$$$$$$$$AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	11	146	6.15	81.56
31 AUG 78	20	+++++$$$$$AAAAAAAAAAAAAAAFFFFF	6	152	3.35	84.92
12 SEP 78	20	&&&&&AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNN	11	163	6.15	91.06
18 SEP 78	20	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLRRRRRRRRRR	16	179	8.94	100.00
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16				

FREQUENCY

Figure 28. Funnel trap trip analysis of amphibians and reptiles on the East Pool site. Trip = date of trapping; traps = total number of traps set on a date. See Table 1 for species codes

FREQUENCY BAR CHART

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TRIP        MINUTES                                                                                    FREQ   CUM.    PERCENT     CUM.
                                                                                                              FREQ              PERCENT
                       |
14 JUL 77              |                                                                                  0      0       0.00      0.00
20 OCT 77     10       |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                               7      7      11.11     11.11
 3 NOV 77      7       |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                                                    6     13       9.52     20.63
16 NOV 77     36       |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                     12     25      19.05     39.68
 7 DEC 77     34       |SSSSSSSSSSSSSSSSSSSSSSSSS                                                         5     30       7.94     47.62
14 DEC 77     45       |FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF                                                    6     36       9.52     57.14
12 JAN 78     23       |                                                                                  0     36       0.00     57.14
30 JAN 78     19       |                                                                                  0     36       0.00     57.14
14 FEB 78     18       |                                                                                  0     36       0.00     57.14
27 FEB 78     20       |SSSSS                                                                             1     37       1.59     58.73
21 MAR 78     30       |CCCCCCCCCCSSSSSSSSSSSSSSS                                                         5     42       7.94     66.67
28 MAR 78     26       |SSSSS                                                                             1     43       1.59     68.25
11 APR 78     33       |FFFFFFFFFFFFFFFNNNNN                                                              4     47       6.35     74.60
24 APR 78     30       |                                                                                  0     47       0.00     74.60
 5 MAY 78     29       |FFFFFFFFFF                                                                        2     49       3.17     77.78
23 MAY 78     39       |TTTTT                                                                             1     50       1.59     79.37
19 JUN 78     39       |SSSSSSSSSSSSSSS                                                                   3     53       4.76     84.13
27 JUN 78     19       |LLLLL                                                                             1     54       1.59     85.71
10 JUL 78     31       |FFFFFTTTTT                                                                        2     56       3.17     88.89
27 JUL 78     21       |                                                                                  0     56       0.00     88.89
14 AUG 78     24       |NNNNNSSSSS                                                                        2     58       3.17     92.06
31 AUG 78     25       |SSSSS                                                                             1     59       1.59     93.65
13 SEP 78     29       |SSSSSSSSSS                                                                        2     61       3.17     96.83
29 SEP 78     26       |FFFFFNNNNN                                                                        2     63       3.17    100.00
                       -----+----+----+----+----+----+----+----+----+----+----+----+
                            1    2    3    4    5    6    7    8    9   10   11   12
                                                FREQUENCY
```

Figure 29. Herp-patrol trip analysis of salamanders and reptiles on the East Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
  TRIP    MINUTES                                                                               FREQ  CUM.   PERCENT      CUM.
                                                                                                      FREQ               PERCENT
                       |
14 JUL 77              |HHHHHHHH                                                                 15    15      2.99        2.99
20 OCT 77      10      |                                                                          0    15      0.00        2.99
 3 NOV 77      .7      |                                                                          0    15      0.00        2.99
16 NOV 77      36      |                                                                          0    15      0.00        2.99
 7 DEC 77      34      |                                                                          0    15      0.00        2.99
14 DEC 77      45      |UU                                                                        3    18      0.60        3.59
12 JAN 78      23      |UU                                                                        3    21      0.60        4.19
30 JAN 78      19      |                                                                          0    21      0.00        4.19
14 FEB 78      18      |UUU                                                                       5    26      1.00        5.19
27 FEB 78      20      |UUUUU                                                                    10    36      2.00        7.19
21 MAR 78      30      |                                                                          0    36      0.00        7.19
28 MAR 78      26      |                                                                          0    36      0.00        7.19
11 APR 78      33      |HHHHHHHHHHHYY                                                            24    60      4.79       11.98
24 APR 78      30      |HHHHHHHHHHHYYYY                                                          30    90      5.99       17.96
 5 MAY 78      29      |HHUUU                                                                     8    98      1.60       19.56
23 MAY 78      39      |HHHHHHHHHH                                                               20   118      3.99       23.55
19 JUN 78      39      |HHHHHRYY                                                                 16   134      3.19       26.75
27 JUN 78      19      |HHHHHHHHHHRRYY                                                           27   161      5.39       32.14
10 JUL 78      31      |HHHHHHHHHHHHHHHRRUYYYYYYY                                                47   208      9.38       41.52
27 JUL 78      21      |HHHHHHHHHHHHHHHHHHHHHHHHHHHHYYYYYY                                       67   275     13.37       54.89
14 AUG 78      24      |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHYY                            89   364     17.76       72.65
31 AUG 78      25      |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHYYYYYYYYY                        98   462     19.56       92.22
13 SEP 78      29      |HHHHHHHHHHHHHRYYYYYY                                                     39   501      7.78      100.00
29 SEP 78      26      |                                                                          0   501      0.00      100.00
                       -----+----+----+----+----+----+----+----+----+----
                           10   20   30   40   50   60   70   80   90

                                          FREQUENCY
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Figure 30. Herp-patrol trip analysis of calling frogs on the East Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

POINT  TRAPS                                                                FREQ   CUM.   PERCENT     CUM.
                                                                                   FREQ             PERCENT
               |
   0    20     |                                                              0      0      0.00      0.00
  10    20     |                                                              0      0      0.00      0.00
  20    20     |                                                              0      0      0.00      0.00
  30    20     |                                                              0      0      0.00      0.00
  40    20     |                                                              0      0      0.00      0.00
  50     0     |                                                              0      0      0.00      0.00
  60    24     |                                                              0      0      0.00      0.00
  70    24     |                                                              0      0      0.00      0.00
  80    24     |                                                              0      0      0.00      0.00
  90    24     |AAAAAAAAAALLLLLLLLLL                                          2      2      2.99      2.99
 100    24     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLL  6      8      8.96     11.94
 110    24     |LLLLLLLLLL                                                    1      9      1.49     13.43
 120    24     |                                                              0      9      0.00     13.43
 130    24     |AAAAAAAAAAAAAAAAAAAA                                          2     11      2.99     16.42
 140    24     |                                                              0     11      0.00     16.42
 150    24     |AAAAAAAAAALLLLLLLLLL                                          2     13      2.99     19.40
 160    24     |SSSSSSSSSS                                                    1     14      1.49     20.90
 170    24     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA            5     19      7.46     28.36
 180    24     |AAAAAAAAAA                                                    1     20      1.49     29.85
 190    20     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLL            5     25      7.46     37.31
 200    19     |                                                              0     25      0.00     37.31
 210    14     |                                                              0     25      0.00     37.31
 220    14     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLLLLLLLLLLLUUUUUUUUUU  6     31      8.96     46.27
 230    14     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA            5     36      7.46     53.73
 240    14     |AAAAAAAAAAAAAAAAAAAALLLLLLLLLL                                3     39      4.48     58.21
 250    13     |AAAAAAAAAA                                                    1     40      1.49     59.70
 260    13     |AAAAAAAAAAAAAAAAAAAA                                          2     42      2.99     62.69
 270    12     |                                                              0     42      0.00     62.69
 280     9     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAASSSSSSSSSS            5     47      7.46     70.15
 290     8     |AAAAAAAAAAAAAAAAAAAA                                          2     49      2.99     73.13
 300     8     |$$$$$$$$$$AAAAAAAAAA                                          2     51      2.99     76.12
 310     7     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLL            5     56      7.46     83.58
 320     7     |AAAAAAAAAAAAAAAAAAAA                                          2     58      2.99     86.57
 330     6     |LLLLLLLLLLSSSSSSSSSS                                          2     60      2.99     89.55
 340     6     |AAAAAAAAAAAAAAAAAAAA                                          2     62      2.99     92.54
 350     6     |AAAAAAAAAAAAAAAAAAAA                                          2     64      2.99     95.52
 360     6     |AAAAAAAAAAAAAAAAAAAA                                          2     66      2.99     98.51
 370     6     |AAAAAAAAAA                                                    1     67      1.49    100.00
               ----------+---------+---------+---------+---------+---------+
                         1         2         3         4         5         6

                                   FREQUENCY BAR CHART
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Figure 31. Funnel trap point analysis of amphibians and reptiles on the West Pool site. Point = location where traps were set; traps = total number of traps set at a sample point. See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT                                                                 FREQ  CUM.   PERCENT    CUM.
                                                                            FREQ              PERCENT
        |
    0   |                                                               0     0      0.00      0.00
   10   |                                                               0     0      0.00      0.00
   20   |SSSSSSSSSSSSSSSSSSSS                                           4     4      6.15      6.15
   30   |LLLLLSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS            10    14     15.38     21.54
   40   |CCCCC                                                          1    15      1.54     23.08
   50   |                                                               0    15      0.00     23.08
   60   |SSSSS                                                          1    16      1.54     24.62
   70   |SSSSS                                                          1    17      1.54     26.15
   80   |SSSSSSSSSS                                                     2    19      3.08     29.23
   90   |NNNNNSSSSS                                                     2    21      3.08     32.31
  100   |                                                               0    21      0.00     32.31
  110   |NNNNNSSSSSSSSSSSSSSSSSSSS                                      5    26      7.69     40.00
  120   |SSSSSSSSSSSSSSS                                                3    29      4.62     44.62
  130   |SSSSS                                                          1    30      1.54     46.15
  140   |SSSSS                                                          1    31      1.54     47.69
  150   |SSSSS                                                          1    32      1.54     49.23
  160   |SSSSS                                                          1    33      1.54     50.77
  170   |SSSSSSSSSS                                                     2    35      3.08     53.85
  180   |SSSSSSSSSS                                                     2    37      3.08     56.92
  190   |                                                               0    37      0.00     56.92
  200   |SSSSSSSSSSSSSSS                                                3    40      4.62     61.54
  210   |FFFFFNNNNNNNNNNSSSSSSSSSS                                      5    45      7.69     69.23
  220   |SSSSS                                                          1    46      1.54     70.77
  230   |AAAAASSSSSSSSSS                                                3    49      4.62     75.38
  240   |NNNNN                                                          1    50      1.54     76.92
  250   |SSSSSSSSSSSSSSS                                                3    53      4.62     81.54
  260   |                                                               0    53      0.00     81.54
  270   |                                                               0    53      0.00     81.54
  280   |NNNNN                                                          1    54      1.54     83.08
  290   |                                                               0    54      0.00     83.08
  300   |FFFFFKKKKKSSSSSSSSSSSSSSSSSSSS                                 6    60      9.23     92.31
  310   |                                                               0    60      0.00     92.31
  320   |                                                               0    60      0.00     92.31
  330   |                                                               0    60      0.00     92.31
  340   |                                                               0    60      0.00     92.31
  350   |LLLLL                                                          1    61      1.54     93.85
  360   |CCCCCNNNNNNNNNN                                                3    64      4.62     98.46
  370   |SSSSS                                                          1    65      1.54    100.00
        -----+----+----+----+----+----+----+----+----+----+
             1    2    3    4    5    6    7    8    9   10
```

FREQUENCY BAR CHART

Figure 32. Herp-patrol point analysis of salamanders and reptiles on the West Pool site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT                                                                                  FREQ  CUM.   PERCENT    CUM.
                                                                                             FREQ              PERCENT
        |
    0   |HHHHH                                                                            5     5     0.90      0.90
   10   |                                                                                 0     5     0.00      0.90
   20   |                                                                                 0     5     0.00      0.90
   30   |                                                                                 0     5     0.00      0.90
   40   |                                                                                 0     5     0.00      0.90
   50   |                                                                                 0     5     0.00      0.90
   60   |U                                                                                1     6     0.18      1.08
   70   |                                                                                 0     6     0.00      1.08
   80   |G                                                                                1     7     0.18      1.25
   90   |HHHHHH                                                                           6    13     1.08      2.33
  100   |HHHHHHHHHUUUUUU                                                                 15    28     2.69      5.02
  110   |HHHHHHHHHHHHHHHHHHH                                                             19    47     3.41      8.42
  120   |GGGGGGGGGHHHHHHHHHHHHHHHHHHHHHHHH                                               33    80     5.91     14.34
  130   |GHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH                                             35   115     6.27     20.61
  140   |HHHHHHHHU                                                                        9   124     1.61     22.22
  150   |HHHHHHHHHHHHH                                                                   13   137     2.33     24.55
  160   |GGGGGHHHHHHHHHHHHHHHHHHHHHHH                                                    28   165     5.02     29.57
  170   |HHHHHHHHHHHHUU                                                                  14   179     2.51     32.08
  180   |GHHHHHHHH                                                                        9   188     1.61     33.69
  190   |HHHHHHHHHHHHH                                                                   13   201     2.33     36.02
  200   |HHHHHUUU                                                                         8   209     1.43     37.46
  210   |HHHHHHHHH                                                                        9   218     1.61     39.07
  220   |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHUU                            52   270     9.32     48.39
  230   |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH                  62   332    11.11     59.50
  240   |HHHHHHHHHHHHHHHHHHHHHUUUU                                                       25   357     4.48     63.98
  250   |HHHHHH                                                                           6   363     1.08     65.05
  260   |GHHHU                                                                            5   368     0.90     65.95
  270   |GGGHHHHHHHHU                                                                    12   380     2.15     68.10
  280   |GGGGGGHHHHHHHHHHHHHHUU                                                          22   402     3.94     72.04
  290   |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH                                          38   440     6.81     78.85
  300   |GGHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH                                     43   483     7.71     86.56
  310   |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHU                                48   531     8.60     95.16
  320   |HHHH                                                                             4   535     0.72     95.88
  330   |HHHHH                                                                            5   540     0.90     96.77
  340   |GGGH                                                                             4   544     0.72     97.49
  350   |GGGG                                                                             4   548     0.72     98.21
  360   |GHHHH                                                                            5   553     0.90     99.10
  370   |GGGGH                                                                            5   558     0.90    100.00
        -----+----+----+----+----+----+----+----+----+----+----+----+--
             5   10   15   20   25   30   35   40   45   50   55   60
```

FREQUENCY BAR CHART

Figure 33. Herp-patrol point analysis of calling frogs on the West Pool site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

TRIP        TRAPS                                                                                  FREQ   CUM.    PERCENT      CUM.
                                                                                                          FREQ               PERCENT
                     |
04 AUG 77    13      |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNN                                          7      7       9.46        9.46
01 SEP 77    13      |LLLLLLLLLL                                                                   2      9       2.70       12.16
30 SEP 77    13      |AAAAALLLLL                                                                   2     11       2.70       14.86
 4 NOV 77    13      |AAAAAAAAAAAAAAA                                                              3     14       4.05       18.92
 7 DEC 77    21      |                                                                             0     14       0.00       18.92
22 DEC 77    21      |                                                                             0     14       0.00       18.92
11 JAN 78    20      |                                                                             0     14       0.00       18.92
29 JAN 78    21      |                                                                             0     14       0.00       18.92
14 FEB 78    21      |                                                                             0     14       0.00       18.92
28 FEB 78    21      |                                                                             0     14       0.00       18.92
21 MAR 78    24      |                                                                             0     14       0.00       18.92
29 MAR 78    27      |AAAAA                                                                        1     15       1.35       20.27
12 APR 78    27      |AAAAAAAAAA                                                                   2     17       2.70       22.97
24 APR 78    26      |                                                                             0     17       0.00       22.97
 8 MAY 78    27      |                                                                             0     17       0.00       22.97
24 MAY 78    28      |AAAAAAAAAAAAAAAAAAAALLLLLLLLLL                                               6     23       8.11       31.08
20 JUN 78    30      |AAAAAAAAAAAAAAA                                                              3     26       4.05       35.14
27 JUN 78    32      |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                     8     34      10.81       45.95
10 JUL 78    37      |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA           13     47      17.57       63.51
27 JUL 78    37      |AAAAAAAAAA                                                                   2     49       2.70       66.22
15 AUG 78    37      |AAAAAAAAAAAAAAAAAAAAAAAAA                                                    5     54       6.76       72.97
31 AUG 78    37      |$$$$$AAAAAAAAAAAAAAAAAAAALLLLLLLLLLSSSSS                                     8     62      10.81       83.78
13 SEP 78    37      |AAAAAAAAAAAAAAAAAAAAAAAAALLLLLLLLLLSSSSSSSSSS                                9     71      12.16       95.95
29 SEP 78    37      |AAAAALLLLLUUUUU                                                              3     74       4.05      100.00
                     -----+----+----+----+----+----+----+----+----+----+----+----+----+
                          1    2    3    4    5    6    7    8    9   10   11   12   13
                                                FREQUENCY
```

Figure 34. Funnel trap trip analysis of amphibians and reptiles on the West Pool site. Trip = date of trapping; traps = total number of traps set on a date. See Table 1 for species codes

```
                                   FREQUENCY BAR CHART

TRIP       MINUTES                                                                   FREQ  CUM.   PERCENT    CUM.
                                                                                           FREQ              PERCENT
                  |
04 AUG 77         |KKKKKSSSSS                                                          2     2     3.08      3.08
01 SEP 77         |                                                                    0     2     0.00      3.08
08 SEP 77         |CCCCCNNNNNSSSSS                                                     3     5     4.62      7.69
22 SEP 77         |SSSSSSSSSSSSSSSSSSSSSSSSS                                           5    10     7.69     15.38
29 SEP 77         |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                 10    20    15.38     30.77
20 OCT 77   15    |SSSSSSSSSS                                                          2    22     3.08     33.85
03 NOV 77   20    |SSSSSSSSSS                                                          2    24     3.08     36.92
16 NOV 77   28    |SSSSSSSSSSSSSSSSSSSSSSSSS                                           5    29     7.69     44.62
 7 DEC 77   13    |                                                                    0    29     0.00     44.62
14 DEC 77   23    |                                                                    0    29     0.00     44.62
22 DEC 77   20    |SSSSS                                                               1    30     1.54     46.15
11 JAN 78   18    |                                                                    0    30     0.00     46.15
29 JAN 78   11    |SSSSS                                                               1    31     1.54     47.69
14 FEB 78   20    |SSSSSSSSSSSSSSS                                                     3    34     4.62     52.31
28 FEB 78   59    |LLLLLSSSSSSSSSSSSSSS                                                4    38     6.15     58.46
21 MAR 78   71    |NNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS 15    53    23.08     81.54
28 MAR 78   50    |LLLLLSSSSSSSSSSSSSSS                                                4    57     6.15     87.69
11 APR 78   42    |SSSSS                                                               1    58     1.54     89.23
24 APR 78   33    |                                                                    0    58     0.00     89.23
 8 MAY 78   57    |AAAAAFFFFF                                                          2    60     3.08     92.31
23 MAY 78   51    |NNNNN                                                               1    61     1.54     93.85
19 JUN 78   40    |                                                                    0    61     0.00     93.85
27 JUN 78   38    |FFFFF                                                               1    62     1.54     95.38
10 JUL 78   46    |                                                                    0    62     0.00     95.38
27 JUL 78   49    |CCCCC                                                               1    63     1.54     96.92
14 AUG 78   45    |                                                                    0    63     0.00     96.92
31 AUG 78   39    |                                                                    0    63     0.00     96.92
13 SEP 78   38    |                                                                    0    63     0.00     96.92
29 SEP 78   37    |NNNNNNNNNN                                                          2    65     3.08    100.00
                  +----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
                       1    2    3    4    5    6    7    8    9   10   11   12   13   14   15
                                              FREQUENCY
```

Figure 35. Herp-patrol trip analysis of salamanders and reptiles on the West Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

TRIP	MINUTES	FREQUENCY	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
04 AUG 77			0	0	0.00	0.00
01 SEP 77			0	0	0.00	0.00
08 SEP 77		HHHH	10	10	1.79	1.79
22 SEP 77			0	10	0.00	1.79
29 SEP 77			0	10	0.00	1.79
20 OCT 77	15		0	10	0.00	1.79
03 NOV 77	20		0	10	0.00	1.79
16 NOV 77	28		0	10	0.00	1.79
7 DEC 77	13		0	10	0.00	1.79
14 DEC 77	23		0	10	0.00	1.79
22 DEC 77	20		0	10	0.00	1.79
11 JAN 78	18	U	3	13	0.54	2.33
29 JAN 78	11		0	13	0.00	2.33
14 FEB 78	20		0	13	0.00	2.33
28 FEB 78	59		0	13	0.00	2.33
21 MAR 78	71		2	15	0.36	2.69
28 MAR 78	50	UUU	8	23	1.43	4.12
11 APR 78	42	HHHH	11	34	1.97	6.09
24 APR 78	33	HU	4	38	0.72	6.81
8 MAY 78	57	GGGGGGHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	93	131	16.67	23.48
23 MAY 78	51		0	131	0.00	23.48
19 JUN 78	40	HHHUU	11	142	1.97	25.45
27 JUN 78	38		0	142	0.00	25.45
10 JUL 78	46	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHU	181	323	32.44	57.89
27 JUL 78	49	GGHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHU	85	408	15.23	73.12
14 AUG 78	45	GGGGGGHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	107	515	19.18	92.29
31 AUG 78	39	GHHHHHHHHHHHHH	35	550	6.27	98.57
13 SEP 78	38	HHH	8	558	1.43	100.00
29 SEP 78	37		0	558	0.00	100.00

Frequency axis: 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180

FREQUENCY

Figure 36. Herp-patrol trip analysis of calling frogs on the West Pool site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
POINT  TRAPS                                                                                        FREQ  CUM.   PERCENT    CUM.
                                                                                                          FREQ              PERCENT
                |
    0   21      |                                                                                     0      0      0.00      0.00
   10   21      |NNNNNNNNNNNNNNNNNNNN                                                                 1      1      3.70      3.70
   20   21      |AAAAAAAAAAAAAAAAAAAASSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS   4      5     14.81     18.52
   30   21      |                                                                                     0      5      0.00     18.52
   40   21      |SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS                         3      8     11.11     29.63
 1050   21      |KKKKKKKKKKKKKKKKKKKKLLLLLLLLLLLLLLLLLLLL                                             2     10      7.41     37.04
 1060   21      |                                                                                     0     10      0.00     37.04
 1070   21      |                                                                                     0     10      0.00     37.04
 1080   21      |AAAAAAAAAAAAAAAAAAAASSSSSSSSSSSSSSSSSSSS                                             2     12      7.41     44.44
 1090   21      |                                                                                     0     12      0.00     44.44
 1100   21      |AAAAAAAAAAAAAAAAAAAASSSSSSSSSSSSSSSSSSSSWWWWWWWWWWWWWWWWWWWW                         3     15     11.11     55.56
 1110   21      |IIIIIIIIIIIIIIIIIIII                                                                 1     16      3.70     59.26
 1120   21      |NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN                                             2     18      7.41     66.67
 1130   21      |                                                                                     0     18      0.00     66.67
 1140   21      |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                             2     20      7.41     74.07
 1150   21      |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS     4     24     14.81     88.89
 1160   21      |                                                                                     0     24      0.00     88.89
 1170   21      |LLLLLLLLLLLLLLLLLLLL                                                                 1     25      3.70     92.59
 1180   21      |LLLLLLLLLLLLLLLLLLLL                                                                 1     26      3.70     96.30
 1190   21      |SSSSSSSSSSSSSSSSSSSS                                                                 1     27      3.70    100.00
                --------------------+-------------------+-------------------+-------------------+
                                    1                   2                   3                   4

                                              FREQUENCY
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Figure 37. Funnel trap point analysis of amphibians and reptiles on the Gatlin Canal site. Point = location where traps were set; traps = total number of traps set at a sample point. See Table 1 for species codes

FREQUENCY BAR CHART

POINT		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	KKSS	2	2	0.52	0.52
10	FFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	24	26	6.25	6.77
20	CCCCFFNNSSSSSSSSSSSSSSSSSSSSSSSSSSSS	18	44	4.69	11.46
30	CCCCFFSSSSSSSSSSSSSSSSSSSSSSSSSS	16	60	4.17	15.63
40	CCFFOOSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	20	80	5.21	20.83
50	SSSSSSSSSS	5	85	1.30	22.14
60	SSSS	2	87	0.52	22.66
70		0	87	0.00	22.66
80	SSSS	2	89	0.52	23.18
90	SS	1	90	0.26	23.44
100	SSWW	2	92	0.52	23.96
110	SS	1	93	0.26	24.22
120	LLSS	2	95	0.52	24.74
130	SSSSSSSS	4	99	1.04	25.78
140	SS	1	100	0.26	26.04
150	SSSS	2	102	0.52	26.56
160	WW	1	103	0.26	26.82
170		0	103	0.00	26.82
180	FFSSSS	3	106	0.78	27.60
190	SSSS	2	108	0.52	28.13
200	SSSSSS	3	111	0.78	28.91
210		0	111	0.00	28.91
220	SS	1	112	0.26	29.17
230		0	112	0.00	29.17
240	SSSS	2	114	0.52	29.69
250	LL	1	115	0.26	29.95
260	SS	1	116	0.26	30.21
270	FFLLSSSSSSSS	6	122	1.56	31.77
280	NN	1	123	0.26	32.03
290		0	123	0.00	32.03
300	SSSSSSSSSSSSSSSS	8	131	2.08	34.11
310		0	131	0.00	34.11
320	CCSS	2	133	0.52	34.64
330	DDFFFFSS	4	137	1.04	35.68
340	SSSSSS	3	140	0.78	36.46
350	NN	1	141	0.26	36.72
360	SSSSSS	3	144	0.78	37.50
370	CCFFSSSSSS	5	149	1.30	38.80
380	CCCCSSSS	4	153	1.04	39.84
390		0	153	0.00	39.84
400		0	153	0.00	39.84
410		0	153	0.00	39.84
420	KK	1	154	0.26	40.10
430	CCCCCCCCFFFFFFSSSSSSSSSSSSSSSSSSSS	17	171	4.43	44.53
440	FFFFSS	3	174	0.78	45.31
450		0	174	0.00	45.31
460	CC	1	175	0.26	45.57
470	SSSS	2	177	0.52	46.09
1000	FFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSTTWW	22	199	5.73	51.82
1010	FFSSSSSSSSSS	6	205	1.56	53.39
1020	CCCCCCFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	24	229	6.25	59.64
1030	SSWW	2	231	0.52	60.16
1040	NNSSSSSSSSSS	6	237	1.56	61.72
1050	CCFFSSTT	4	241	1.04	62.76
1060	NNSSSS	3	244	0.78	63.54
1070	SSSSWW	3	247	0.78	64.32
1080	SS	1	248	0.26	64.58
1090	SSSSSS	3	251	0.78	65.36
1100	FFNNWW	3	254	0.78	66.15
1110	NNNNSSSS	4	258	1.04	67.19
1120	CCSSSS	3	261	0.78	67.97
1130	SSSS	2	263	0.52	68.49
1140	SSSSSSSSSSSSSSSSSSSS	10	273	2.60	71.09
1150	SSSS	2	275	0.52	71.61
1160	SSWW	2	277	0.52	72.14
1170		0	277	0.00	72.14
1180	KKSSSSSSSSSSSS	7	284	1.82	73.96
1190	CCSSSSSS	4	288	1.04	75.00
1200	OO	1	289	0.26	75.26
1210	SSSSSSSS	4	293	1.04	76.30
1220	FFWW	2	295	0.52	76.82
1230		0	295	0.00	76.82
1240		0	295	0.00	76.82
1250		0	295	0.00	76.82
1260	FFFFFFFFSSSSSSWW	8	303	2.08	78.91
1270	SSSSSSSS	4	307	1.04	79.95
1280	FFFF	2	309	0.52	80.47
1290	SSSSSSSSSSWW	6	315	1.56	82.03
1300	FFFFSSSSSSSSSSSSSSSSSSSSSSSS	14	329	3.65	85.68
1310	FF	1	330	0.26	85.94
1320	CCFFFFNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	21	351	5.47	91.41
1330	CCSSSSWW	4	355	1.04	92.45
1340	CCFFNNNNSSSSSSSSSSSSSSSSSSSSSSSSSS	17	372	4.43	96.88
1350		0	372	0.00	96.88
1360	CCSSSS	3	375	0.78	97.66
1370	FF	1	376	0.26	97.92
1380	SS	1	377	0.26	98.18
1390		0	377	0.00	98.18
1400	NN	1	378	0.26	98.44
1410		0	378	0.00	98.44
1420		0	378	0.00	98.44
1430	SSSS	2	380	0.52	98.96
1440	SSSSSSSS	4	384	1.04	100.00
1450		0	384	0.00	100.00
1460		0	384	0.00	100.00
1470		0	384	0.00	100.00

2 4 6 8 10 12 14 16 18 20 22 24

FREQUENCY

Figure 38. Herp-patrol point analysis of salamanders and reptiles on the Gatlin Canal site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

POINT		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0		0	0	0.00	0.00
10	HHHHHHHHHHYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY	5	5	5.15	5.15
20	HHHHHHHHHHHHHHHHHHHHRRRRRRRRRRYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY	6	11	6.19	11.34
30	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHYYYYYYYYYYYYYYYYYYYY	6	17	6.19	17.53
40	HHHHHHHHHHUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	9	26	9.28	26.80
50	YYYYYYYYYYYYYYYYYYYY	2	28	2.06	28.87
60		0	28	0.00	28.87
70	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHYYYYYYYYYY	6	34	6.19	35.05
80		0	34	0.00	35.05
90		0	34	0.00	35.05
100		0	34	0.00	35.05
110		0	34	0.00	35.05
120		0	34	0.00	35.05
130		0	34	0.00	35.05
140	UUUUUUUUUUUUUUUUUUUU	2	36	2.06	37.11
150		0	36	0.00	37.11
160	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	6	42	6.19	43.30
170		0	42	0.00	43.30
180	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	6	48	6.19	49.48
190	GGGGGGGGGG	1	49	1.03	50.52
200	UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	5	54	5.15	55.67
210	UUUUUUUUUU	1	55	1.03	56.70
220		0	55	0.00	56.70
230		0	55	0.00	56.70
240		0	55	0.00	56.70
250		0	55	0.00	56.70
260	YYYYYYYYYY	1	56	1.03	57.73
270	UUUUUUUUUU	1	57	1.03	58.76
280		0	57	0.00	58.76
290	UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUYYYYYYYYYY	4	61	4.12	62.89
300		0	61	0.00	62.89
310		0	61	0.00	62.89
320		0	61	0.00	62.89
330	BBBBBBBBBB	1	62	1.03	63.92
340		0	62	0.00	63.92
350		0	62	0.00	63.92
360		0	62	0.00	63.92
370	UUUUUUUUUUUUUUUUUUUU	2	64	2.06	65.98
380	HHHHHHHHHH	1	65	1.03	67.01
390		0	65	0.00	67.01
400		0	65	0.00	67.01
410		0	65	0.00	67.01
420	GGGGGGGGGGHHHHHHHHHH	2	67	2.06	69.07
430	UUUUUUUUUU	1	68	1.03	70.10
440		0	68	0.00	70.10
450		0	68	0.00	70.10
460		0	68	0.00	70.10
470		0	68	0.00	70.10
1000	BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB	6	74	6.19	76.29
1010		0	74	0.00	76.29
1020		0	74	0.00	76.29
1030		0	74	0.00	76.29
1040		0	74	0.00	76.29
1050	HHHHHHHHHH	1	75	1.03	77.32
1060		0	75	0.00	77.32
1070	HHHHHHHHHHHHHHHHHHHHHHHHHHHHHH	3	78	3.09	80.41
1080	HHHHHHHHHH	1	79	1.03	81.44
1090	RRRRRRRRRR	1	80	1.03	82.47
1100	BBBBBBBBBBHHHHHHHHHHHHHHHHHHHH	3	83	3.09	85.57
1110		0	83	0.00	85.57
1120	HHHHHHHHHH	1	84	1.03	86.60
1130		0	84	0.00	86.60
1140		0	84	0.00	86.60
1150		0	84	0.00	86.60
1160	UUUUUUUUUU	1	85	1.03	87.63
1170		0	85	0.00	87.63
1180	UUUUUUUUUU	1	86	1.03	88.66
1190		0	86	0.00	88.66
1200		0	86	0.00	88.66
1210		0	86	0.00	88.66
1220		0	86	0.00	88.66
1230		0	86	0.00	88.66
1240		0	86	0.00	88.66
1250		0	86	0.00	88.66
1260		0	86	0.00	88.66
1270		0	86	0.00	88.66
1280	GGGGGGGGGGGGGGGGGGGG	2	88	2.06	90.72
1290		0	88	0.00	90.72
1300		0	88	0.00	90.72
1310		0	88	0.00	90.72
1320		0	88	0.00	90.72
1330		0	88	0.00	90.72
1340		0	88	0.00	90.72
1350		0	88	0.00	90.72
1360		0	88	0.00	90.72
1370	UUUUUUUUUUUUUUUUUUUU	2	90	2.06	92.78
1380		0	90	0.00	92.78
1390		0	90	0.00	92.78
1400	BBBBBBBBBB	1	91	1.03	93.81
1410		0	91	0.00	93.81
1420	BBBBBBBBBBBBBBBBBBBBUUUUUUUUUU	3	94	3.09	96.91
1440		0	97	0.00	100.00
1450		0	97	0.00	100.00
1460		0	97	0.00	100.00
1470		0	97	0.00	100.00

1 2 3 4 5 6 7 8 9

FREQUENCY

Figure 39. Herp-patrol point analysis of calling frogs on the Gatlin Canal site. Point = midpoint of 10-m. section of herp-patrol transect. See Table 1 for species codes

FREQUENCY BAR CHART

TRIP	TRAPS	BAR	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
10 NOV 77	21		0	0	0.00	0.00
18 DEC 77	21		0	0	0.00	0.00
29 DEC 77	21		0	0	0.00	0.00
11 JAN 78	20		0	0	0.00	0.00
29 JAN 78	21		0	0	0.00	0.00
14 FEB 78	21		0	0	0.00	0.00
1 MAR 78	21	AAAAAAAAAAAAAAAAAAAA	1	1	3.70	3.70
22 MAR 78	20	AAAAAAAAAAAAAAAAAAAA	1	2	3.70	7.41
28 MAR 78	20		0	2	0.00	7.41
12 APR 78	20	LLLLLLLLLLLLLLLLLLLL	1	3	3.70	11.11
24 APR 78	20		0	3	0.00	11.11
9 MAY 78	20	AAAAAAAAAAAAAAAAAAAA	1	4	3.70	14.81
24 MAY 78	20	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	2	6	7.41	22.22
19 JUN 78	20		0	6	0.00	22.22
27 JUN 78	20	IIIIIIIIIIIIIIIIIIIINNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS	4	10	14.81	37.04
9 JUL 78	20	KKKKKKKKKKKKKKKKKKKKNNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSS	3	13	11.11	48.15
27 JUL 78	20	AAAAAAAAAAAAAAAAAAAANNNNNNNNNNNNNNNNNNNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	4	17	14.81	62.96
15 AUG 78	20	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAASSSSSSSSSSSSSSSSSSSS	3	20	11.11	74.07
31 AUG 78	20	LLLLLLLLLLLLLLLLLLLLWWWWWWWWWWWWWWWWWWWW	2	22	7.41	81.48
13 SEP 78	20	LLLLLLLLLLLLLLLLLLLLSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	3	25	11.11	92.59
29 SEP 78	20	AAAAAAAAAAAAAAAAAAAASSSSSSSSSSSSSSSSSSSS	2	27	7.41	100.00

FREQUENCY (axis: 1, 2, 3, 4)

Figure 40. Funnel trap trip analysis of amphibians and reptiles on the Gatlin Canal site. Trip = date of trapping; traps = total number of traps set on a date. See Table 1 for species codes

FREQUENCY BAR CHART

TRIP	MINUTES		FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
14 JUL 77		FFFFFFFFKKKKKKSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	25	25	6.44	6.44
04 AUG 77		CCCCCCCCFFFFFFFFNNSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	39	64	10.05	16.49
17 AUG 77		CCCCFFKKSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSWW	30	94	7.73	24.23
22 SEP 77		CCCCFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	27	121	6.96	31.19
20 OCT 77		CCFFKKSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSTT	40	161	10.31	41.49
03 NOV 77	113	CCCCCCFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	29	190	7.47	48.97
16 NOV 77	70	CCFFFFNNNNNNNNSSSSSSSSSSSSSSSSSSSS	17	207	4.38	53.35
14 DEC 77	87	FFFFLLSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	23	230	5.93	59.28
22 DEC 77	90	SSSSSSSSSS	5	235	1.29	60.57
12 JAN 78	61	SSSSSSSSSSSSSSSSSSSSSSSS	12	247	3.09	63.66
30 JAN 78	70	SSSSSSSSSSSS	6	253	1.55	65.21
14 FEB 78	46	DDFFSSSSSS	5	258	1.29	66.49
28 FEB 78	65	CCFFFFOOSSSSSSSSSSSSSSSSSSSSSSSSWW	17	275	4.38	70.88
21 MAR 78	83	CCFFFFFFSSSSWWWW	8	283	2.06	72.94
27 MAR 78	64	CCFFNNSSSSWW	6	289	1.55	74.48
10 APR 78	62	SSSS	2	291	0.52	75.00
24 APR 78	67	OO	1	292	0.26	75.26
8 MAY 78	47	CCFFNNSSWW	5	297	1.29	76.55
23 MAY 78	68	CCSS	2	299	0.52	77.06
19 JUN 78	58	LLSSSSSSSSSSSSSSSSSSSSSS	12	311	3.09	80.15
27 JUN 78	63	CCCC	2	313	0.52	80.67
10 JUL 78	56	LLSSSSSSSSSSSSSSSSWW	10	323	2.58	83.25
27 JUL 78	60	CCFFFFFFKKSSSS	7	330	1.80	85.05
15 AUG 78	76	CCFFFFFFFFSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSWWWW	22	352	5.67	90.72
31 AUG 78	82	NNSSSSSSSSSSSSSSSSTTWW	11	363	2.84	93.56
13 SEP 78	55	CCFFNNNNSSSSSSSSSSSSSSSSSSSSWW	15	378	3.87	97.42
29 SEP 78	78	CCFFNNNNSSSSSSSSSSSS	10	388	2.58	100.00
		2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40				

FREQUENCY

Figure 41. Herp-patrol trip analysis of salamanders and reptiles on the Gatlin Canal site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

FREQUENCY BAR CHART

```
TRIP        MINUTES                                                                     FREQ  CUM.   PERCENT    CUM.
                                                                                              FREQ             PERCENT
                      |
14 JUL 77             |                                                                   0     0     0.00      0.00
04 AUG 77             |                                                                   0     0     0.00      0.00
17 AUG 77             |                                                                   0     0     0.00      0.00
22 SEP 77             |                                                                   0     0     0.00      0.00
20 OCT 77             |RR                                                                 1     1     0.82      0.82
03 NOV 77  113        |                                                                   0     1     0.00      0.82
16 NOV 77   70        |                                                                   0     1     0.00      0.82
14 DEC 77   87        |UUUUUUUUUUUUUUUU                                                   8     9     6.56      7.38
22 DEC 77   90        |                                                                   0     9     0.00      7.38
12 JAN 78   61        |                                                                   0     9     0.00      7.38
30 JAN 78   70        |                                                                   0     9     0.00      7.38
14 FEB 78   46        |                                                                   0     9     0.00      7.38
28 FEB 78   65        |UUUUUUUUUUUUUUUU                                                   8    17     6.56     13.93
21 MAR 78   83        |                                                                   0    17     0.00     13.93
27 MAR 78   64        |UUUUUUUU                                                           4    21     3.28     17.21
10 APR 78   62        |UUUUUU                                                             3    24     2.46     19.67
24 APR 78   67        |BBBBBBBBBB                                                         5    29     4.10     23.77
 8 MAY 78   47        |BBGGHHUU                                                           4    33     3.28     27.05
23 MAY 78   68        |                                                                   0    33     0.00     27.05
19 JUN 78   58        |HHHHHHHHHHRRUUUU                                                   8    41     6.56     33.61
27 JUN 78   63        |HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHUU                25    66    20.49     54.10
10 JUL 78   56        |HHHHHHHHHHUUUUYYYYYYYY                                            11    77     9.02     63.11
27 JUL 78   60        |YY                                                                 1    78     0.82     63.93
15 AUG 78   76        |BBBBBBBBBBGGGGGGHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHUUYYYYYY            27   105    22.13     86.07
31 AUG 78   82        |BBBBHHHHHHHHHHHHYYYYYYYYYY                                        13   118    10.66     96.72
13 SEP 78   55        |HHHHYY                                                             3   121     2.46     99.18
29 SEP 78   78        |HH                                                                 1   122     0.82    100.00
                      ----+---+---+---+---+---+---+---+---+---+---+---+---+--
                          2   4   6   8  10  12  14  16  18  20  22  24  26

                                        FREQUENCY
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Figure 42. Herp-patrol trip analysis of calling frogs on the Gatlin Canal site. Trip = date of herp-patrol; minutes = total sampling time of a herp-patrol on a date (time not recorded prior to 13 October 1977). See Table 1 for species codes

APPENDIX A: SUMMARY OF PLANT SPECIES AND SUBSTRATUM TYPE FOR ALL PERMANENT SHORELINE HERPETOFAUNAL TRAPPING STATIONS ON LAKE CONWAY DURING THE BASELINE STUDY PERIOD. Given are the three most abundant plant species or habitat conditions coded (1, 2, or 3) in order of decreasing percent cover within a 2-sq.-m. area of each trapping station averaged over quarterly samples. If a significant proportion of the quadrat contained no vegetation but was in natural surroundings, it was coded as "Bare bottom"; likewise, "Beach" means man-made white sand beach; and "No other vegetation present" means that other plant species were monodominant or codominant in the quadrat. If plant cover changed as a result of man-made habitat modification during the baseline study period, the date of change and new conditions are given in parentheses. Substratum types are coded as follows: 1 = sand; 2 = 1-5 cm. mud; 3 = 6-10 cm. mud; 4 = 11-15 cm. mud; 5 = 15-20 cm. mud; 6 = > 20 cm. mud.

Table A1

South Pool

Habitat Condition	Trap Station														
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
Eichhornia crassipes	1	2	1	1											
Fuirena scirpoides					1	1	1	1	1	1	1		3	1	1
Nuphar luteum															
Panicum hemitomon						2					3	1			
Panicum repens															
Pontederia lanceolata		3	3	2	3				2	2		2	2	2	2
Typha latifolia					2						2	3	1	3	
No other vegetation present	2					3	2	2	3	3					3
Bare bottom		1	2	3											
Beach															
Substratum	3	4	4	4	1	1	1	1	1	1	1	1	1	1	1
Date of Habitat Change															

(Continued)

Table A1 (Continued)

Habitat Condition	Trap Station 150	160	170	180	190	200	210	220	230	240	250	260	270	280	290
Eichhornia crassipes															
Fuirena scirpoides	2	1					1	1	1						
Nuphar luteum															
Panicum hemitomon	1	2								1(2)	1	1	1	1	1
Panicum repens															
Pontederia lanceolata	3	3	1	1	2	1	2	2	2						
Typha latifolia															
No other vegetation present			3	3	3	3	3	3	3	2(3)	2(2)	2(2)	2(2)	2(2)	2(2)
Bare bottom			2	2	1	2									
Beach										(1)	(1)	(1)	(1)	(1)	(1)
Substratum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Date of Habitat Change										5/78	5/78	12/77	12/77	12/77	12/77

(Continued)

Table A1 (Continued)

Habitat Condition	Trap Station													
	300	310	320	330	340	350	360	370	380	390	400	410	420	430
Eichhornia crassipes														
Fuirena scirpoides		2	1	1	1	1(1)	1	2		1(1)				
Nuphar luteum														
Panicum hemitomon	1	1	2	2	2	2			2(3)	2(2)	2			
Panicum repens														
Pontederia lanceolata			3				2	1	1(1)		1	1	1	1
Typha latifolia														
No other vegetation present	2(2)	3(2)		3	3	3	3	3	3	3	3	2	2	2
Bare bottom														
Beach	(1)	(1)				(2)			(2)	(3)				
Substratum	1	1	1	1	1	1	2	2	2	2	2	2	2	2
Date of Habitat Change						12/77			3/78	3/78				

(Continued)

Table A1 (Concluded)

Habitat Condition	Trap Station 440	450	460
Eichhornia crassipes	2	1	1
Fuirena scirpoides			
Nuphar luteum			
Panicum hemitomon	3	2	
Panicum repens			
Pontederia lanceolata	1		
Typha latifolia			
No other vegetation present		3	2
Bare bottom			
Beach			
Substratum	2	3	3
Date of Habitat Change			

(Sheet 4 of 4)

Table A2

Middle Pool

Habitat Condition	Trap Station 1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110
Eichhornia crassipes												
Fuirena scirpoides	2	2	2									
Nuphar luteum												
Panicum hemitomon	1	1	1									
Panicum repens												
Pontederia lanceolata				2	2	2	2	2	2	2	2	2
Typha latifolia				1	1	1	1	1	1	1	1	1
No other vegetation present	3(2)	3(2)	3(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Bare bottom				3	3	3	3	3	3	3	3	3
Beach	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Substratum	1	1	1	1	2	2	2	2	2	2	3	3
Date of Habitat Change	4/78	4/78	4/78	4/78	4/78	4/78	4/78	4/78	4/78	4/78	4/78	4/78

(Continued)

Table A2 (Concluded)

Habitat Condition	Trap Station								
	1120	1130	1140	1150	1160	1170	1180	1190	1200
Eichhornia crassipes				1	1	2	1	1	1
Fuirena scirpoides									
Nuphar luteum									
Panicum hemitomon									
Panicum repens									
Pontederia lanceolata	2	1	1	2	2	1			
Typha latifolia	1	2	2	3	3	3			
No other vegetation present	(2)	3	3				2	2	2
Bare bottom	3								
Beach	(1)								
Substratum	3	3	3	3	3	4	5	5	5
Date of Habitat Change	4/78								

Table A3

East Pool

Habitat Condition	Trap Station 1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110
Eichhornia crassipes		3				3	2	2	1	1	1
Fuirena scirpoides											
Nuphar luteum											
Panicum hemitomon	2										
Panicum repens											
Pontederia lanceolata		2	1	1	2	2					
Typha latifolia	1	1			1	1	1	1	2	2	2
No other vegetation present	3		2	2	3		3	3	3	3	3
Bare bottom											
Beach											
Substratum	3	3	2	2	2	5	5	6	6	6	5
Date of Habitat Change											

(Continued)

Table A3 (Concluded)

Habitat Condition	Trap Station 1120	1130	1140	1150	1160	1170	1180	1190	1200
Eichhornia crassipes	1	1	1	1	1	1	1	1	1
Fuirena scirpoides									
Nuphar luteum									
Panicum hemitomon									
Panicum repens									
Pontederia lanceolata									
Typha latifolia	2								
No other vegetation present	3	2	2	2	2	2	2	2	2
Bare bottom									
Beach									
Substratum	4	3	2	3	2	4	6	6	6
Date of Habitat Change									

Table A4

West Pool

Habitat Condition	Trap Station*													
	0	10	20	30	40	60	70	80	90	100	110	120	130	140
Eichhornia crassipes									2	1	2	1	2	2
Fuirena scirpoides														
Nuphar luteum														
Panicum hemitomon			1	1	1			1						
Panicum repens						2	2							
Pontederia lanceolata								2	1	2	1		1	1
Typha latifolia														
No other vegetation present	2	2	2	2	2	3	3	3	3	3	3	2	3	3
Bare bottom														
Beach	1	1				1	1							
Substratum	1	1	1	1	1	1	1	3	2	4	4	3	2	2
Date of Habitat Change														

(Continued)

* Trap station 50 was located under a boat dock and this trap was not set.

(Sheet 1 of 3)

Table A4 (Continued)

Habitat Condition	Trap Station 150	160	170	180	190	200	210	220	230	240	250	260	270	280
Eichhornia crassipes				2	1	3		1	1	1	2	1		
Fuirena scirpoides														
Nuphar luteum														
Panicum hemitomon	1	2				2	2					3		2
Panicum repens														
Pontederia lanceolata	2			1	2	1	1	2		2	1	2	2	1
Typha latifolia		1	1										1	
No other vegetation present	3		2	3	3		3	3	2	3			3	3
Bare bottom		3									3			
Beach														
Substratum	2	2	2	2	3	3	2	5	4	4	2	2	2	2
Date of Habitat Change														

(Continued)

Table A4 (Concluded)

Habitat Condition	Trap Station 290	300	310	320	330	340	350	360	370
Eichhornia crassipes		1	1	1		3	1	1	1
Fuirena scirpoides									
Nuphar luteum									
Panicum hemitomon	2				2	2		2	3
Panicum repens									
Pontederia lanceolata	1				1	1	2		
Typha latifolia	3	2		2				3	2
No other vegetation present		3	2	3	3		3		
Bare bottom									
Beach									
Substratum	3	3	6	5	2	3	5	3	2
Date of Habitat Change									

(Sheet 3 of 3)

Table A5

Gatlin Canal

Habitat Condition	Trap Station											
	0	10	20	30	40	1050	1060	1070	1080	1090	1100	1110
Eichhornia crassipes												
Fuirena scirpoides												
Nuphar luteum		1	1	1	1							
Panicum hemitomon												
Panicum repens						1	2	1	1	1	1	1
Pontederia lanceolata							1		2	3		
Typha latifolia												
No other vegetation present	2	2	2	2	2	2	3	3	3		2	2
Bare bottom	1							2		2		
Beach												
Substratum	2	3	3	3	3	3	3	3	3	3	3	4
Date of Habitat Change												

(Continued)

Table A5 (Concluded)

Habitat Condition	Trap Station 1120	1130	1140	1150	1160	1170	1180	1190
Eichhornia crassipes								
Fuirena scirpoides								
Nuphar luteum								
Panicum hemitomon								
Panicum repens	1	1	1	1	1	1	1	1
Pontederia lanceolata						2		
Typha latifolia								
No other vegetation present	2	3	3	3	3	3	2	2
Bare bottom		2	2	2	2			
Beach								
Substratum	4	4	4	5	5	5	4	5
Date of Habitat Change								