

climatic conditions (such as periods of drought), and factors such as irrigation and measures used in combating the freeze. The coldhardiness of the tree and the degree of dormancy at the time of the freeze are also critical factors. In addition, the duration of the freeze and the wind speed are important factors (Miller and Downton, 1993). A study of freeze protection for citrus provided by Lake Apopka was conducted for the Lake Apopka Restoration study (Bartholic and Bill, 1977). In this study it was reported that Lake Apopka had a mean depth of about 5.5 feet. Results of this study have been applied qualitatively to the Alligator Lake Chain and Lake Gentry area, much as Ingram (1983) did for Lake Griffin. The Lake Apopka freeze protection study concluded that an insignificant reduction in freeze protection would occur if at least one meter (3.3 feet) of water depth was maintained over a large portion of the normal lake area. It was assumed that temperature modification occurred on the south and southeast sides of Lake Apopka or on the downwind side.

4.11.3. MEAN DEPTHS AND SURFACE AREA COVERAGE: Tables 1 through 3 contain the capacity (volume), surface area, and mean depth of the lakes of the Alligator Chain and Lake Gentry at their high pool water levels, 1980-1981 drought approximate winter water levels, and proposed drawdown low pool water levels, respectively. The water surface elevations used in Table 2 were selected because during the 1980-1981 drought, Lake Alligator water levels were around 61 feet and Lake Gentry water levels were around 59.5 feet for most of the winter. Table 3 indicates that all of the lakes' mean depths during the proposed drawdown will be greater than one meter (3.3 feet). Lakes Alligator and Gentry will each have mean depths of two meters or more. The maps in Figures 7 and 8 show areas which would remain covered by water and areas where lake bottom would be exposed at the proposed drawdown low water levels; these maps were provided by the SFWMD. A comparison of Table 1 through 3 and Figures 7 and 8 reveals that even at the proposed drawdown low water levels, there is still a sizable volume of water and surface area coverage in the lakes.

4.11.4. HISTORIC FREEZES AND ASSOCIATED WATER SURFACE ELEVATIONS: The citrus groves adjacent to these lakes have apparently experienced historic freezes that occurred in conjunction with low lake levels. Table 4 shows Lake Alligator historic freezes and associated water levels since construction of the C&SF Project. Agricultural interests have expressed the view that the proposed drawdown would result in increased vulnerability of groves to freezes. However, in view of the factors outlined above, the proposed drawdown lake levels are expected to provide a level of freeze protection similar to that which has been available under historical conditions.

4.11.5. POTENTIAL BENEFIT OF DRAWDOWN TO FREEZE PROTECTION:

Although there is a potential reduction in freeze protection due to the drawdown, the probable long-term impact of the drawdown on freeze protection is positive.

The project will eliminate the buildup of organics and subsequent dense plant growth in Alligator Lake adjacent to the citrus groves. This should prevent the formation over time of a vegetative buffer which could block the direct flow of air from the warm water to the groves.

4.12. SURFACE AND GROUNDWATER

4.12.1. SURFACE WATER WITHDRAWALS: Withdrawals of surface water and groundwater in the Upper Kissimmee Basin are regulated by the SFWMD. Consumptive use permits are not required for water withdrawals for individual domestic use. SFWMD staff have researched current water use permits by domestic and agricultural users in the Alligator Lake Chain/Lake Gentry area and did not find any active consumptive use permits for surface water withdrawals from the lakes of the Alligator Chain or Lake Gentry. SFWMD staff have estimated that only about half of the homeowners in the area irrigate their properties, and that of them, only about forty percent make surface water withdrawals from the lakes themselves. These surface water withdrawals are made by homeowners chiefly on the west side of Alligator Lake. These water users may need to extend their pump intakes farther out into the lakes due to the drawdown.

4.12.2. POTENTIAL NEED FOR INCREASED IRRIGATION: According to SFWMD staff all permitted water withdrawals by domestic and agricultural water users in the Alligator Lake Chain/Lake Gentry area are made from the Floridan aquifer or deeper levels of the surficial aquifer. However, the temporary lowering of water levels in the lakes due to the proposed drawdown may require some agricultural interests to increase their irrigation to maintain the water table near the root zone of citrus crops. The proposed drawdown may require some horticultural interests to increase their irrigation to maintain the water table at a level adequate for their plants. Additional sprinkling of lawns and lawn plants may also be needed. The extent of projected impacts to the water table aquifer is discussed below.

4.12.3. GROUNDWATER MODELING ANALYSIS: The SFWMD has prepared a report entitled, "Analysis of Projected Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer". Appendix V contains this report. SFWMD prepared this report after conducting an extensive investigation in response to concerns raised by aquacultural interests which are discussed in section 4.12, below. To test the potential impacts of the proposed drawdown on the adjacent surficial aquifer, three predictive simulations were run using a computer model. These scenarios--the Wet Winter Condition, Typical Condition, and Severe Drought Condition--are described on page 9 of SFWMD's report. The report includes maps for each scenario showing the extent of projected impacts to the water table aquifer due to the proposed drawdown. Please refer to these maps which can be found on pages 11, 14, and 19 of the report.

The map on page 11 indicates that in the Wet Winter Condition, the area in which the water table would be lowered due to the drawdown (excluding impacts of less than 0.25 feet) includes areas between the lakes and in general also extends outward less than 1.0 miles from the edge of each lake, except in the vicinity of Big Bend Swamp. There, the projected impacts can extend further from the lakes, up to about 2.7 miles east of Lake Gentry.

The map on page 14 indicates that in the Typical Condition, the area in which the water table would be lowered due to the drawdown (excluding impacts of less than 0.25 feet) includes areas between the lakes and in general also extends outward less than 1.3 miles from the edge of each lake, except in the vicinity of Big Bend Swamp. There, the projected impacts can extend further from the lakes; they extend continuously up to about 3.0 miles east of Lake Gentry. Also there is a scattering of impacts in the 0.25 - 0.50 ft range which occurs even further east.

The map on page 19 indicates that in the Severe Drought Condition, the area in which the water table would be lowered due to the drawdown (excluding impacts of less than 0.25 feet) includes areas between the lakes and in general also extends outward less than 2.0 miles from the edge of each lake, except in the vicinity of Big Bend Swamp. There, the projected impacts can extend further from the lakes; they extend continuously up to about 3.3 miles east of Lake Gentry. Also there is a scattering of impacts in the 0.25 to 0.50-ft range which occurs several miles east of the Alligator Chain and Lake Gentry.

In the above simulations it was assumed that Brick Lake would be drawn down along with the rest of the Alligator Chain. The extent of impacts to the water table would be lessened if a weir is constructed in the vicinity of Brick Lake Canal so that Brick Lake is not drawn down with the rest of the Alligator Chain. Likewise, if the extreme drawdown of Lake Gentry were to be postponed to a future year (an alternative described in section 2.01.3), the extent of impacts to the water table would be lessened. The SFWMD report's appendices contain an additional map showing the extent of projected impacts during the Alligator Chain's extreme drawdown under the Typical Condition for the "Gentry Held" alternative. This map indicates that in the Typical Condition/"Gentry Held" scenario, the area in which the water table would be lowered due to the Alligator Chain's extreme drawdown (excluding impacts of less than 0.25 feet) includes areas between the lakes and in general also extends outward less than 1.2 miles from the edge of each lake, except in the vicinity of Lake Gentry and Big Bend Swamp. Compared to the Typical Condition scenario with Gentry drawn down along with the Alligator Chain, this scenario eliminates projected impacts on roughly three sides of Lake Gentry during the Alligator Chain's extreme drawdown. It also reduces the areal extent and magnitude of projected impacts to the east of Lake Gentry in Big Bend Swamp during the Alligator Chain's extreme drawdown.

The SFWMD submitted the *Analysis of Projected Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer - July 28, 1998* (the report that was included in Appendix V of the Draft EIS) and the *Alligator Lake Drawdown Study Model Documentation - August 26, 1998* to peer review. Three experts in hydrologic modeling were selected and sent the reports in December 1998. The SFWMD has done additional work in response to the comments received from the experts. This work has been incorporated into SFWMD's analysis and a revised report has been produced (included as APPENDIX V of this Final EIS).

According to SFWMD, after modifications to the model were made, the calibration period (8/97 - 6/98) was re-run to verify that the model was still working correctly, and a verification simulation was run (6/98 - 12/98) to assess model performance through the prolonged dry period. The model verification run was made to compare model predictions to actual water levels in the monitoring wells. In both cases no significant deviation from the calibration response was observed.

An additional modeling scenario was run using the revised model and 1997-98 weather conditions. The model scenario had the drawdown in the Alligator Lake Chain as occurring in spring 1998 to an elevation of 60 feet. Lake stages in Lake Gentry were simulated using the "Hold Gentry" alternative. The projected changes of the model scenario drawdown to the water table are shown on Figure 20 of page 28 of the report in Appendix V. Compared to the Wet Winter Condition Scenario with Gentry drawn down along with the Alligator Chain, this scenario eliminates projected impacts to the water table on roughly three sides of Lake Gentry during the Alligator Chain's extreme drawdown. It also reduces the areal extent and magnitude of projected impacts in western Big Bend Swamp during the Alligator Chain's extreme drawdown.

4.12.4. EFFECTS ON THE FLORIDAN AQUIFER: In light of the fact that the USGS has classified the Alligator Lake Chain and Lake Gentry area as an area of very low recharge to the Floridan Aquifer (see Figure 9), it is estimated that water levels in the Floridan Aquifer could be at most only slightly reduced as a result of the proposed drawdown.

4.13. CONFLICTS AND CONTROVERSY

As discussed in section 2.02 of the Alternatives Analysis, concerns were raised over the possibility that drawing down the lakes may cause groundwater levels in the vicinity to drop, resulting in water loss to aquaculture ponds located in the area. In response to the concerns of the fish farmers, the SFWMD conducted a very thorough investigation of potential effects of the drawdown on groundwater levels, including installation of monitoring wells and data collection, an aquifer response test or "test drawdown", and groundwater modeling. In the Spring 1998 aquifer response test, lake levels were dropped about two feet over a roughly two-week period. SFWMD performed a groundwater modeling analysis

which indicates that as of April 22, 1998, the aquifer response test had no effect on groundwater levels at the fish farms. SFWMD performed further groundwater modeling and presented their analysis in a report dated July 28, 1998, entitled, "Analysis of Project Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer". This report also indicates that there were no adverse impacts at any of the fish farms due to the aquifer response test. Following the peer review and additional work discussed in Section 4.11.3, above, the SFWMD has produced a revised report, which is appended to this FEIS. This report indicates that impacts to the water table aquifer are projected under certain conditions at Blackwater Fisheries and Moonlight Fisheries. According to the fish farmers, lowering of water levels in fish ponds, due to lower groundwater levels, may cause a significant impact to the commercial viability of their operations. It should be noted, however, that large volumes of water are lost from commercial fish ponds naturally to evaporation and seepage, and these conditions are exacerbated during periods of low rainfall. It is generally accepted that, under normal conditions, a minimum pumping rate of 13 gallons per minute (gpm) is required for each surface acre of ponds. This means that a 100 acre fish farm would need wells capable of producing 1,300 gpm of water in order to maintain water quality (Swann, 1994). The SFWMD has agreed to the modification of groundwater withdrawal permits to allow additional pumping at the affected fish farms.

Figures 22 and 23 show Alligator Lake Chain and Lake Gentry water levels, respectively, from January through July of 1998, which includes the period of the regulation schedule modification for the "test drawdown or aquifer response test (mid-March through May 1998)". The lowering of water levels for the aquifer response test began 1 April 1998. The normal regulation schedules for these lakes are represented by solid lines; modified regulation schedules for the test drawdown are represented by dashed lines. The SFWMD has provided the graphs in Figures 24 and 25 which show Alligator Lake Chain water levels for the approximate periods January 1998 - June 1998 and January 1998 - May 1999. These graphs allow one to view recorded water levels in relation to gate settings, rainfall at St. Cloud, and the normal and 1-in-3 year regulation schedules for the Alligator Chain. The SFWMD has also provided the Lake Gentry graph in Figure 26 which is similar to the graph in Figure 25. Although the test drawdown regulation schedules are not shown in these three graphs, they are represented in Figures 22 and 23 mentioned above.

The regulation schedule modification for the test drawdown required that normal low pool stages in the Alligator Chain and Lake Gentry, once reached, be maintained until 1 June 1998. However, the SFWMD did not make discharges from the spillways that regulate these lakes during the period 22 April 1998 to 31 May 1998. Rainfall amounts during this period were low enough that the lakes stayed approximately at or declined below their normal low pool stages without the use of discharges from these spillways.

Figure 27 is entitled "Rainfall Monthly Totals". This figure can be used to compare monthly rainfall totals for St. Cloud during 1998 and the first half of 1999 with the average monthly rainfall totals for Kissimmee based on records from 1901-1994. This graph was provided by the SFWMD.

The graph in Figure 28 is entitled "Alligator Lake Stages, Comparison of 1970-97 to 1998" and was provided by the SFWMD. This graph shows Alligator Lake Stages during 1998, and also the daily maximum, minimum, and average water levels for the period of record 1970-97.

Figure 29 shows water levels at the OS-181 well during 1998 and part of 1999, and also the daily maximum, minimum, and average water levels for the period of record 1970-1997. This graph was provided by the SFWMD. The OS-181 well is located on the south side of U.S. Highway 192 just south of the junction of County Road 534 approximately 1.5 miles from Alligator Lake. The OS-181 well is located between Alligator Lake and the Castelli fish farm.

Figures 30 and 31, respectively, show the water levels in Alligator Lake and Lake Tohopekaliga during the first five months of 1999.

4.13.1. MOONLIGHT FISHERIES: This farm is located between Lakes Alligator and Gentry, about a mile from each lake. Based on the above report by SFWMD, fish pond water levels at this farm are projected to drop less than 0.25 feet under typical rainfall conditions. Under severe drought conditions, water levels are projected to be lowered by a maximum of 1.5 feet. Actual impacts may be lessened by the existence of a hard pan soil layer under the ponds that helps to isolate them from the aquifer. Impacts at this property could also be reduced by holding Lake Gentry at 59.0 ft. (see Alternatives), instead of its drawdown level of 56.5 ft. With the implementation of this alternative, water level impacts to Moonlight Fisheries are projected to be less than 0.5 feet during severe drought conditions (see Figure 17 on page 23 of Appendix V). An extreme drawdown of Lake Gentry and habitat enhancement work there could be done in a subsequent year.

4.13.2. BLACKWATER FISHERIES: This farm is located approximately 0.6 mile from Alligator Lake. Maximum water level impacts here are projected to be less than 0.4 feet under typical rainfall conditions. Under severe drought conditions, water levels are projected to be lowered by a maximum of 0.7 feet. A very important factor is the large drainage ditch that runs through this property, exerting a direct influence on pond water levels. Modeling analysis shows that actual impacts at this farm could be reduced by placing a structure in the ditch to hold water on the property (see Figure 23 on page 30 of Appendix V). The Osceola County Commission has expressed a willingness to put in such a structure. This structure would be removed in the event of heavy rainfall and possible flooding.

Please refer to Appendix V for the above report by SFWMD dated June, 1999. Hydrographs, maps, results of computer simulations, and other technical information are contained therein. This report incorporates recommendations resulting from extensive peer review of the July 1998 report.

4.14. EFFECT ON LAKEFRONT PROPERTIES

According to the SFWMD, the lowering of lake levels will expose some bulkheads located on adjacent properties. A drawdown could increase the load on the bulkheads. Structures which are dilapidated and in need of repair could experience structural problems when the water level is lowered. The period of low water levels would be a good opportunity for property owners to do repair work on these structures. Property owners adjacent to the lakes will receive a copy of this document and should, as recommended at the public meeting on 6 May 1997, take precautions to stabilize bulkheads on their property. The lowered lake levels should not jeopardize bulkheads that are in good condition. Ranchers may need to extend their fences farther out into the lakes during the drawdown. The FWC has included provisions in its permit from the State of Florida to allow adjacent landowners to extend their fences onto exposed lake bottom. Landowners working under the GFC permit will not have to get their own permit; however, they must work under the FWC's guidelines.

5.00 ENVIRONMENTAL CONSEQUENCES

5.01. RELATIONSHIP OF THE PROPOSED ACTION TO LAND USES PLANS

Since the proposed plan's departure from normal regulation schedules will be temporary and controlled, no significant long-term effect on flood control provisions and existing land use policies is expected. Interference with recreational uses will be short term. Minor noise and dust associated with construction activities will be temporary. Finally, the proposed drawdown plan is anticipated to enhance Alligator Chain and Lake Gentry habitat; this should increase recreational opportunities, which are in full accord with area land and water use guidelines.

5.02. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Implementation of any of the alternatives other than the No Action will result in some short-term losses in overall productivity and in temporary inconvenience to man's activities. Completion of the proposed drawdown plan is expected to result in long-term benefits and some temporary adverse effects during the course of the action. However, over the long run, an increase in beneficial productivity, and preservation and enhancement of a valuable aquatic resource will be realized.

6.00 SUMMARY OF COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REQUIREMENTS.

6.01. CLEAN AIR ACT OF 1972, AS AMENDED 42 U.S.C. 7401 et seq. The FWC has applied for all required permits and will conform with all requirements of the Act related to any emissions produced by the Alligator Lake Chain & Lake Gentry Habitat Enhancement Project. All vehicles, generators, pumps and construction-related engines will conform to Florida emissions standards. All permits will be obtained prior to the start of project work.

6.02. CLEAN WATER ACT (FEDERAL WATER POLLUTION CONTROL ACT), AS AMENDED. 33 U.S.C. 1251 et seq. (PL 92-500).
The FWC has applied for and received a Department of the Army permit to perform work, place structures and place fill in waters of the U.S.

6.03. COASTAL ZONE MANAGEMENT ACT OF 1972, AS AMENDED. 16 U.S.C. 1451 et seq.
The FWC has applied for and received a Florida Department of Environmental Protection permit to perform work in the coastal zone (see section 1.05 of this document).

6.04. ENDANGERED SPECIES ACT (ESA) OF 1973, AS AMENDED. 16 U.S.C. 1531 et seq.
This project was fully coordinated under the ESA through the Corps' Regulatory process and via an informal consultation associated with this NEPA document. In a letter dated June 24, 1997, the FWS concluded that the project is not likely to jeopardize Endangered and Threatened Species.

6.05. FISH AND WILDLIFE COORDINATION ACT, AS AMENDED. 16 U.S.C. 661 et seq.
The proposal was coordinated with the FWS through the Corps' Regulatory and NEPA processes.

6.06. NATIONAL ENVIRONMENTAL POLICY ACT OF 1969, AS AMENDED.
Environmental information on the project has been compiled and the results are presented in this Environmental Impact Statement, which is being circulated prior to finalization in compliance with NEPA.

6.07. NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED.
Cultural resources included in or eligible for inclusion in the National Register of Historic Places will not be affected by the proposed maintenance dredging. Therefore, this project is in compliance with the National Historic Preservation Act and the Archeological and Historic Preservation Act.

6.08. RIVERS AND HARBORS ACT OF 1899, AS AMENDED.

The FGFWC has applied for and received a Department of the Army permit to place structures and fill in navigable waters of the U.S. (see section 1.05 of this document).

6.09. MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

No migratory birds would be adversely affected by project activities. It is expected that forage habitats for birds would be improved. The project is in compliance with these acts.

6.10. EXECUTIVE ORDERS 11988 AND 11990, RESPECTIVELY, FLOOD PLAIN MANAGEMENT AND PROTECTION OF WETLANDS.

The project complies with these E.O.s as the considered action preserves the natural and beneficial values of flood plains and wetlands.

6.11 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE.

The proposed action would not result in any long-term adverse human or environmental effects. Any impacts of the action would not be disproportionate towards any minority or low income population. The activity does not (a) exclude persons from participation in, (b) deny persons the benefit of, or (c) subject persons to discrimination because of their race, color, or national origin. The activity would not impact "subsistence consumption of fish and wildlife".

7.00 COORDINATION AND PUBLIC INVOLVMENT

7.01. AGENCIES AND GROUPS RECEIVING THIS ASSESSMENT

Federal Agencies

- a. U.S. Environmental Protection Agency
- b. U.S. Fish and Wildlife Service
- c. U.S. Department of Agriculture, Natural Resources Conservation Service
- d. U.S. Forest Service
- e. Federal Emergency Management Administration

State of Florida Agencies

- a. State Clearinghouse/Office of the Governor
- b. State Historic Preservation Officer
- c. State Game and Fresh Water Fish Commission
- d. State Department of Environmental Protection
- e. South Florida Water Management District
- f. State Department of Transportation
- g. Bureau of Survey and Mapping

Resource Groups

- a. Florida Audubon Society
- b. Florida Wildlife Federation
- c. Wilderness Society

7.02. PUBLIC INVOLVEMENT

The planning process for the drawdown project has been very open to public involvement. There have been numerous opportunities for the public to provide input, including the frequent Upper Kissimmee Roundtable Discussions; a public information meeting on December 4, 1996; a public hearing on May 6, 1997; the SFWMD Governing Board Meeting Workshop in Kissimmee on August 13, 1997; and a public meeting on October 28, 1997.

Since 1995, various government agencies and members of the public have participated in the Upper Kissimmee Roundtable Discussions, which are typically held on a monthly basis. The purpose of these meetings is to identify and discuss options for improving flood protection and natural ecosystems in the Upper Kissimmee Chain of Lakes through modification of lake regulation schedules with public and agency participation. The agencies and citizen's groups involved in the Roundtable Discussions are trying to leverage resources, share information and data, reduce institutional impediments, improve communication, and develop an interagency, multi-disciplinary approach. Since mid-1996, these meetings have served as a forum for the planning of the Alligator Lake Chain and Lake Gentry extreme drawdown project. Upper Kissimmee Roundtable Discussions have been attended by representatives from the SFWMD, FWC, FDEP, USACE, Florida Department of Agriculture and Consumer Services (FDACS), Osceola County, the Alligator Lake Chain Homeowners Association, and agricultural and aquacultural interests.

The public information meeting on 4 December 1996 took place at Hickory Tree Elementary in St. Cloud, Florida. The formal public hearing on 6 May 1997, also took place at Hickory Tree Elementary. The FWC, SFWMD, Corps, and FDEP participated in both meetings. These meetings had similar formats in that they both included initial talks by agency representatives, informal discussion sessions, and formal public input sessions. During the informal discussion sessions, the public could move around, view displays about the proposed project, and discuss individual concerns with agency technical representatives. During the formal public input sessions, individuals could voice their comments and ask questions. Also, at the December public information meeting, questionnaires were handed out through which the public could provide their ideas and opinions concerning the proposed project. Of the 40 completed questionnaires returned to the GFC, only three contained language that stated opposition to the project. The general perception among agency personnel involved in both meetings was that the public was generally supportive of the project. At both meetings, during the public input sessions, there were no categorical objections to the project.

7.03. COORDINATION

A coordination letter was signed and circulated to Federal, State, and local agencies and the public on 27 May 1997. A draft Environmental Assessment (EA) and (Proposed) Finding of No Significant Impact (FONSI) were coordinated for public comment on August 4, 1997. On 13 August 1997, a Governing Board Meeting of the SFWMD took place at the Kissimmee Civic Center in Kissimmee, Florida. At this meeting, the Governing Board voted on whether to enter into a cooperative agreement with the FGFFC for implementation of the Alligator Lake Chain Drawdown and Muck Removal Project in the amount of up to \$800,000. Comments from the public were heard prior to the Governing Board's vote.

In late August 1997, aquacultural interests raised the issue of possible impacts to fish farms by the drawdown. The possibility of impacts to fish farms had not been a significant issue during the planning of previous Kissimmee Basin lake drawdown projects. Since September 1997, issues related to the question of fish farm impacts have been regularly discussed at the Upper Kissimmee Roundtable Discussions. In addition, interagency meetings with the fish farmers were held specifically to discuss these issues. These meetings took place on 11 September 1997, 5 March 1998, and 30 April 1998.

Also, on 28 October 1997, the FWC held a meeting to update the public concerning the rescheduling of the Alligator Lake Chain and Lake Gentry Habitat Enhancement Project to begin one year later than had been previously proposed. After this meeting there was a public comment session.

In a letter dated December 2, 1997, the USACE indicated that the FWC had rescheduled the start of the drawdown and habitat enhancement project by one year. This letter also indicated that the processes initiated for compliance with the National Environmental Policy Act (NEPA) had been deferred and that the USACE would not be proceeding with the above draft EA and (Proposed) FONSI. A notice of intent to prepare an Environmental Impact Statement (EIS) was forwarded for publication in the Federal Register on February 19, 1998. A draft EIS was fully coordinated with Federal, State and local agencies and the public. This document, the final EIS, which incorporates comments received on the draft, is being fully coordinated prior to finalizing the NEPA process.

8.00 LIST OF PREPARERS

This Draft Environmental Impact Statement (DEIS) was prepared by:

Christine Bauer, Biologist and Principal Author (1999 EIS), USACE
Therese Fretwell, Biologist (1997 EA), USACE
David L. McCullough, Archeologist, USACE
Mark Shafer, Environmental Engineer, USACE

Paul C. Stevenson, RLA, ASLA, Landscape Architect, USACE
Adam C. Stuart, Hydraulic Engineer, USACE

9.00 LIST OF REVIEWERS

This DEIS was reviewed by:

Elmar G. Kurzbach, Chief Environmental Studies Section
James W. Vearil, Chief Water Management Section

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12.00 TABLES

MEAN DEPTHS OF LAKES AT HIGH POOL ELEVATIONS				
Lake	Water Surface Elevation (feet NGVD)	Capacity (acre-feet)	Area (Acres)	Mean Depth (feet)
Alligator	64.0	35000	5140	6.8
Brick	64.0	7700	955	8.1
Lizzie	64.0	7380	930	7.9
Coon	64.0	1140	225	5.1
Center	64.0	3300	620	5.3
Trout	64.0	2340	400	5.9
Gentry	61.5	16470	1740	9.5

TABLE 1

MEAN DEPTHS OF LAKES AT 1980-81 DROUGHT APPROXIMATE WINTER WATER SURFACE ELEVATIONS				
Lake	Water Surface Elevation (feet NGVD)	Capacity (acre-feet)	Area (Acres)	Mean Depth (feet)
Alligator	61.0	25000	3150	7.9
Brick	61.0	5650	600	9.4
Lizzie	61.0	4950	745	6.6
Coon	61.0	700	128	5.5
Center	61.0	1800	370	4.9
Trout	61.0	1420	265	5.4
Gentry	59.5	13100	1625	8.1

TABLE 2

MEAN DEPTHS OF LAKES AT PROPOSED DRAWDOWN ELEVATIONS				
Lake	Water Surface Elevation (feet NGVD)	Capacity (acre-feet)	Area (Acres)	Mean Depth (feet)
Alligator	60.0	22000	3000	7.3
Brick (*)	60.0	5100	585	8.7
Lizzie	60.0	4200	715	5.9
Coon	60.0	570	116	4.9
Center	60.0	1500	325	4.6
Trout	60.0	1175	245	4.8
Gentry	56.5	8800	1330	6.6

TABLE 3

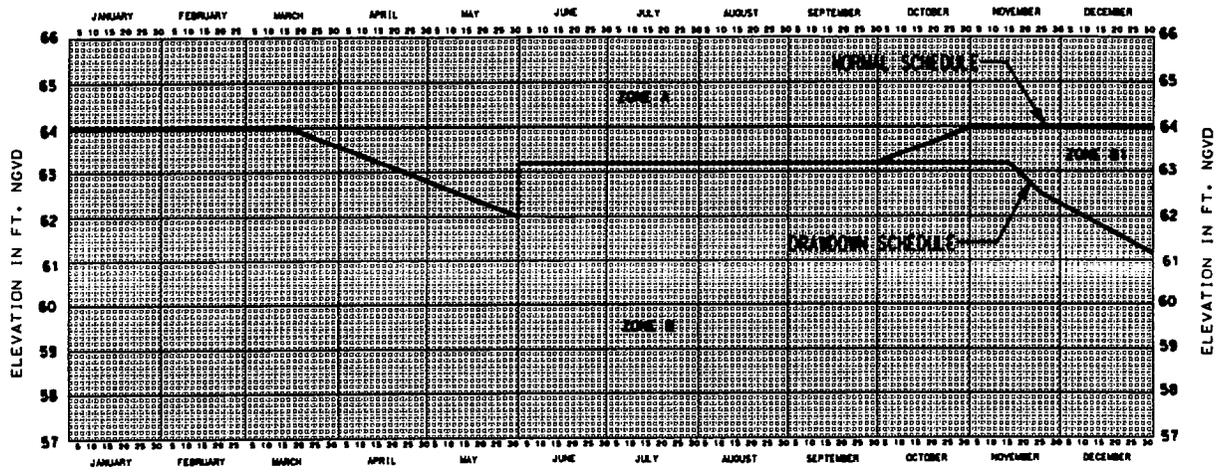
(*) If a temporary weir is constructed in Brick Lake Canal, Brick Lake will only be lowered to about 62.5 feet. At 62.5 feet, Brick Lake has a capacity of 6600 acre-feet, a surface area of 612 acres, and a mean depth of 10.8 feet.

LAKE ALLIGATOR HISTORIC FREEZES AND ASSOCIATED WATER SURFACE ELEVATIONS SINCE CONSTRUCTION OF C&SF PROJECT			
Date of Freeze	Minimum Temperature (°F) Recorded		Alligator Lake Stage (ft., NGVD)
	Location		
	Kissimmee	Orlando	
Dec. 30, 1961	NR	29	60.8
Dec. 11-16, 1962	20	20	59.9
Nov. 24-25, 1970	29	30	61.9
Jan. 20-21, 1971	25	28	61.6
Jan. 19-21, 1977	23	20	63.1
Mar. 3, 1980	25	25	63.4
Jan. 12-14, 1981	21	20	60.8
Jan. 11-12, 1982	23	23	60.7
Dec. 25-26, 1983	21	20	63.9
Jan. 21-22, 1985	19	19	62.4
Dec. 24-25, 1989	22	20	64.1

TABLE 4

Note: Rogers and Rohl (1991) indicate that from 13-14 December 1962, the freeze which occurred was the most damaging Florida freeze this century, with 50 million boxes lost, 50 million salvaged, and 7-10 million trees killed. From 13-14 January 1981, widespread citrus and foliage damage occurred. Up to 80% leaf/fruit drop occurred in some areas; overall there was a production loss of 30 million boxes. From 11-12 January 1982, most of Florida experienced a hard freeze. Citrus and vegetable damage was severe, and defoliation and wood damage were reported. From 25-26 December 1983, a severe freeze occurred in all areas. Fruit were frozen, and there was defoliation, wood damage, and considerable tree mortality in the north. The total fruit loss was 51 million boxes. The freeze of 21-22 January 1985 was a severe freeze; fruit, leaf, and wood damage occurred even after a distinct southward shift in citrus production since 1983. The freeze of 24-25 December 1989 was a hard freeze in all citrus areas, with minimal damage in south Florida and variable foliage/fruit damage elsewhere. According to Henry et al (1994), in the January 1977 freeze, although most citrus trees had developed coldhardiness which prevented extensive tree damage, 98 percent of all oranges were frozen. They note that for Orlando the approximate start of the freezing season is 11 December and the approximate end of the freezing season is 19 February.

13.00 FIGURES



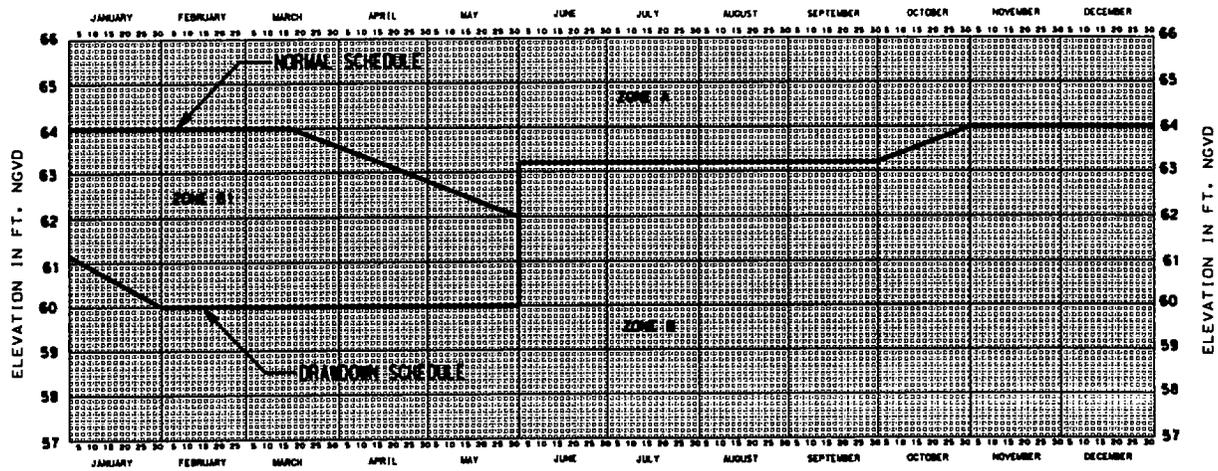
ZONE	RELEASES S-60
A	AT DESIGN CAPACITY (610 CFS) EXCEPT WHEN THE LAKE IS WITHIN 0.5 FEET OF DESIRED ELEVATION. FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS.

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKES ALLIGATOR, BRICK,
LIZZIE, COON, CENTER,
AND TROUT
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
FOR CALENDAR YEAR 1 (YR1) OF THE ALLIGATOR
CHAIN'S EXTREME DRAWDOWN

- NOTES:**
- GRAVITY DRAINAGE OF THE ALLIGATOR CHAIN OF LAKES CAN OCCUR FROM LAKE ALLIGATOR SOUTHWARD THROUGH CANAL C-33 AND FROM LAKE TROUT NORTHWARD THROUGH CANAL C-32C. GRAVITY DRAINAGE MAY BE AUGMENTED BY PUMPING FROM LAKE TROUT TO THE OTHER SIDE OF A TEMPORARY STRUCTURE IN CANAL C-32C. THE TEMPORARY STRUCTURE IN C-32C WILL BE REMOVED SHORTLY AFTER THE STAGE IN LAKE ALLIGATOR REACHES OR EXCEEDS THE STAGE IN LAKES JOEL, MYRTLE, AND PRESTON.
 - ZONE B1 IS A ZONE OF OPERATIONAL FLEXIBILITY. IN THIS ZONE, WATER CONTROL STRUCTURES WILL BE OPERATED TO FACILITATE IMPLEMENTATION OF THE PROPOSED EXTREME DRAWDOWN AND HABITAT ENHANCEMENT PROJECT. THIS MAY INCLUDE TEMPORARILY STOPPING DISCHARGES OR PUMPING TO FACILITATE CONSTRUCTION OR DREDGING.
 - DRAWDOWN PLAN SHALL BE ABANDONED AT THE DISCRETION OF THE COE.
 - UNDER NORMAL RAINFALL CONDITIONS, THE STAGE IN LAKE ALLIGATOR SHOULD REACH 60.0 FEET BY 1 MARCH (YR2).

- A TEMPORARY STRUCTURE MAY BE CONSTRUCTED IN THE VICINITY OF BRICK LAKE CANAL DURING THE PERIOD NOVEMBER (YR1) THROUGH JANUARY (YR2). THE STRUCTURE SHOULD MAINTAIN THE STAGE IN BRICK LAKE AT OR ABOVE ABOUT 62.5 FT. THE STRUCTURE WOULD BE REMOVED SHORTLY AFTER THE STAGE IN LAKE ALLIGATOR REACHES OR EXCEEDS THE STAGE IN BRICK LAKE.

FIGURE 1



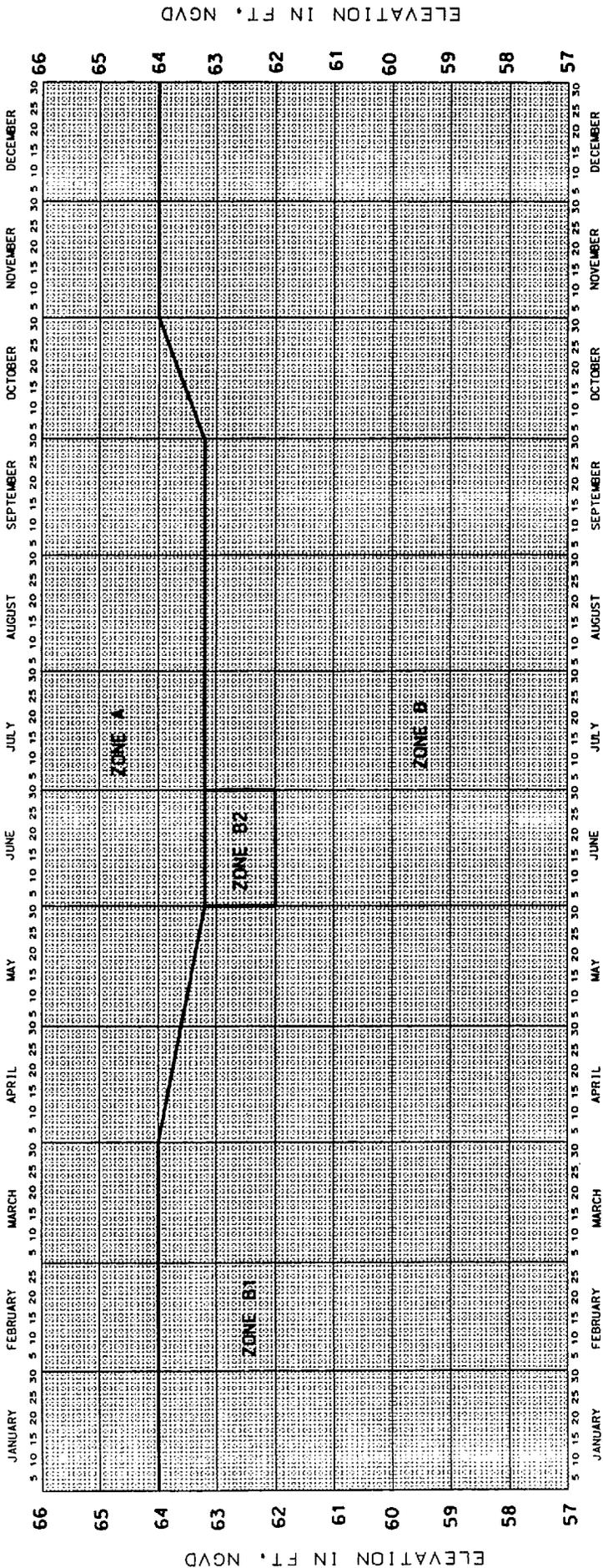
ZONE	RELEASES S-60
A	AT DESIGN CAPACITY (610 CFS) EXCEPT WHEN THE LAKE IS WITHIN 0.5 FEET OF DESIRED ELEVATION. FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS.

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKES ALLIGATOR, BRICK,
LIZZIE, COON, CENTER,
AND TROUT
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
FOR CALENDAR YEAR 2 (YR2) OF THE ALLIGATOR
CHAIN'S EXTREME DRAWDOWN

- NOTES:**
- GRAVITY DRAINAGE OF THE ALLIGATOR CHAIN OF LAKES CAN OCCUR FROM LAKE ALLIGATOR SOUTHWARD THROUGH CANAL C-33 AND FROM LAKE TROUT NORTHWARD THROUGH CANAL C-32C. GRAVITY DRAINAGE MAY BE AUGMENTED BY PUMPING FROM LAKE TROUT TO THE OTHER SIDE OF A TEMPORARY STRUCTURE IN CANAL C-32C. THE TEMPORARY STRUCTURE IN C-32C WILL BE REMOVED SHORTLY AFTER THE STAGE IN LAKE ALLIGATOR REACHES OR EXCEEDS THE STAGE IN LAKES JOEL, MYRTLE, AND PRESTON.
 - ZONE B1 IS A ZONE OF OPERATIONAL FLEXIBILITY. IN THIS ZONE, WATER CONTROL STRUCTURES WILL BE OPERATED TO FACILITATE IMPLEMENTATION OF THE PROPOSED EXTREME DRAWDOWN AND HABITAT ENHANCEMENT PROJECT. THIS MAY INCLUDE TEMPORARILY STOPPING DISCHARGES OR PUMPING TO FACILITATE CONSTRUCTION OR DREDGING.
 - BEGINNING 1 JUNE (YR2), TRANSITION BACK TO INTERIM REGULATION SCHEDULE.
 - DRAWDOWN PLAN SHALL BE ABANDONED AT THE DISCRETION OF THE COE.
 - UNDER NORMAL RAINFALL CONDITIONS, THE STAGE IN LAKE ALLIGATOR SHOULD REACH 60.0 FEET BY 1 MARCH (YR2).

- A TEMPORARY STRUCTURE MAY BE CONSTRUCTED IN THE VICINITY OF BRICK LAKE CANAL DURING THE PERIOD NOVEMBER (YR1) THROUGH JANUARY (YR2). THE STRUCTURE SHOULD MAINTAIN THE STAGE IN BRICK LAKE AT OR ABOVE ABOUT 62.5 FT. THE STRUCTURE WOULD BE REMOVED SHORTLY AFTER THE STAGE IN LAKE ALLIGATOR REACHES OR EXCEEDS THE STAGE IN BRICK LAKE.

FIGURE 2

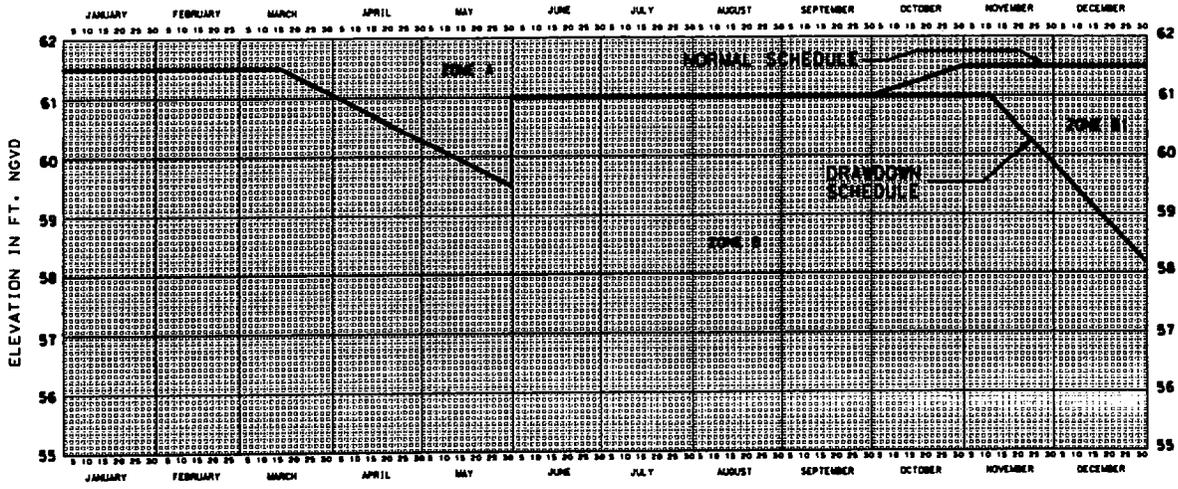


CENTRAL AND SOUTHERN FLORIDA
 INTERIM REGULATION SCHEDULE
 LAKES ALLIGATOR, BRICK,
 LIZZIE, COON, CENTER,
 AND TROUT
 DEPARTMENT OF THE ARMY
 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
 JACKSONVILLE, FLORIDA
 FOR CALENDAR YEAR 2 (YR2) OF LAKE
 GENTRY'S EXTREME DRAWDOWN

RELEASES S-60	
ZONE	
A	AT DESIGN CAPACITY (610 CFS) EXCEPT WHEN THE LAKE IS WITHIN 0.5 FEET OF DESIRED ELEVATION. FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS.

- NOTES:**
- 1) IN THE SECOND CALENDAR YEAR OF LAKE GENTRY'S EXTREME DRAWDOWN, THE REGULATION SCHEDULE WILL REMAIN AT 64.0 FEET FROM MID-MARCH THROUGH THE END OF MARCH. BEGINNING APRIL 1, IT DECLINES TO 63.2 FEET BY JUNE 1.
 - 2) ZONE B2 EXTENDS FROM JUNE 1 THROUGH JUNE 30 OF THE SECOND CALENDAR YEAR OF LAKE GENTRY'S EXTREME DRAWDOWN. IN ZONE B2, RELEASES THROUGH S-60 MAY BE MADE TO HELP REFILL LAKE GENTRY.
 - 3) DRAWDOWN PLAN SHALL BE ABANDONED AT THE DISCRETION OF THE COE.

FIGURE 20



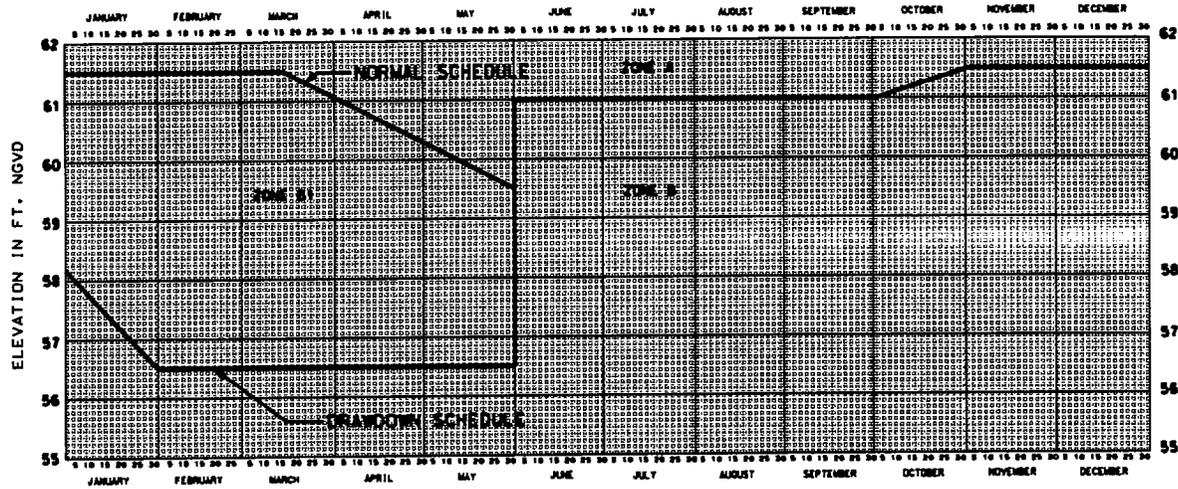
ZONE	RELEASES S-63
A	AT DESIGN CAPACITY (715 CFS) EXCEPT WHEN THE LAKE IS WITHIN 0.5 FEET OF DESIRED STAGE. FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS.

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKE GENTRY
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FOR CALENDAR YEAR 1 (YR1) OF LAKE
GENTRY'S EXTREME DRAWDOWN
AND
CALENDAR YEAR 1 (YR1) OF THE
ALLIGATOR CHAIN'S EXTREME DRAWDOWN

- NOTES:**
- 1) ZONE B1 IS A ZONE OF OPERATIONAL FLEXIBILITY. IN THIS ZONE, WATER CONTROL STRUCTURES WILL BE OPERATED TO FACILITATE IMPLEMENTATION OF THE PROPOSED EXTREME DRAWDOWN AND HABITAT ENHANCEMENT PROJECT. THIS MAY INCLUDE TEMPORARILY STOPPING DISCHARGES TO FACILITATE CONSTRUCTION OR DREDGING.
 - 2) DRAWDOWN PLAN SHALL BE ABANDONED AT THE DISCRETION OF THE COE.
 - 3) IN LAKE GENTRY'S EXTREME DRAWDOWN, UNDER NORMAL RAINFALL CONDITIONS, THE STAGE IN LAKE GENTRY SHOULD REACH 56.5 FEET BY 1 MARCH (YR 2).
 - 4) THIS SCHEDULE WILL ALSO BE USED IN CALENDAR YEAR 1 OF THE ALLIGATOR CHAIN'S EXTREME DRAWDOWN. HOWEVER, DURING THE ALLIGATOR CHAIN'S EXTREME DRAWDOWN, LAKE GENTRY WILL BE LOWERED ONLY AS LOW AS APPROXIMATELY 59.0 FT-NGVD (NOT TO 56.5 FT-NGVD). THIS LOWERING SHOULD BE DONE AS NEEDED TO FACILITATE WATER REMOVAL FROM THE ALLIGATOR CHAIN.

FIGURE 3



ZONE	RELEASES S-63
A	AT DESIGN CAPACITY (715 CFS) EXCEPT WHEN THE LAKE IS WITHIN 0.5 FEET OF DESIRED STAGE. FORECASTS WILL THEN BE MADE AND RELEASES STARTED TO BRING THE LAKE BACK TO SCHEDULE WITHIN 15 DAYS.
B	TO MAINTAIN MINIMUM FLOWS.

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKE GENTRY
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

FOR CALENDAR YEAR 2 (YR2) OF LAKE
GENTRY'S EXTREME DRAWDOWN
AND
CALENDAR YEAR 2 (YR2) OF THE
ALLIGATOR CHAIN'S EXTREME DRAWDOWN

- NOTES:**
- 1) ZONE B1 IS A ZONE OF OPERATIONAL FLEXIBILITY. IN THIS ZONE, WATER CONTROL STRUCTURES WILL BE OPERATED TO FACILITATE IMPLEMENTATION OF THE PROPOSED EXTREME DRAWDOWN AND HABITAT ENHANCEMENT PROJECT. THIS MAY INCLUDE TEMPORARILY STOPPING DISCHARGES TO FACILITATE CONSTRUCTION OR DREDGING.
 - 2) BEGINNING 1 JUNE (YR2), TRANSITION BACK TO INTERIM REGULATION SCHEDULE.
 - 3) IN LAKE GENTRY'S EXTREME DRAWDOWN, UNDER NORMAL RAINFALL CONDITIONS, THE STAGE IN LAKE GENTRY SHOULD REACH 56.5 FEET BY 1 MARCH (YR 2).
 - 4) IN LAKE GENTRY'S EXTREME DRAWDOWN, UNDER NORMAL RAINFALL CONDITIONS, THE STAGE IN LAKE GENTRY SHOULD REACH 56.5 FEET BY 1 MARCH (YR2).
 - 5) THIS SCHEDULE WILL ALSO BE USED IN CALENDAR YEAR 2 OF THE ALLIGATOR CHAIN'S EXTREME DRAWDOWN. HOWEVER, DURING THE ALLIGATOR CHAIN'S EXTREME DRAWDOWN, LAKE GENTRY WILL BE LOWERED ONLY AS LOW AS APPROXIMATELY 59.0 FT-NGVD (NOT TO 56.5 FT-NGVD). THIS LOWERING SHOULD BE DONE AS NEEDED TO FACILITATE WATER REMOVAL FROM THE ALLIGATOR CHAIN.

FIGURE 4