DEPARTMENT OF NATURAL RESOURCE PROTECTION

TECHNICAL REPORT SERIES

TR: 94-04

NEW RIVER RESTORATION PLAN

Water Resources Division

Water Policy and Planning Section

September 27, 1994

Executive Summary

The water quality of the New River and its tributaries has deteriorated such that many indicators of water quality do not meet criteria established by Florida's Department of Environmental Protection. The degradation of water quality has created ecological imbalances in the flora and fauna of the River, and represents a negative impact on the environment, health and economy of the Broward County metropolitan area.

There are a variety of environmental problems associated with the waterways of Broward County, some of which are county-wide, others that are area specific. To better delineate these environmental problem areas, a water quality assessment of the New River was initiated in 1991. The results of that assessment were used to identify the principle geographical areas associated with the New River where environmental problems exist (Broward County Department of Natural Resource Protection 1993).

The goals of the New River Restoration Plan are to improve water quality to meet state criteria, enhance the biological diversity, and create a more pristine condition. The outcome of the Plan will be a New River System that is more ecologically functional and a major aesthetic asset to the community. The Plan consists of a basinwide identification and prioritization of environmental issue areas associated with the New River and documentation of research and monitoring in the prioritized issue areas, from which specific management objectives and action plans were developed. The management objectives are specific to each area of the River and include improving flow characteristics, reducing sludge and contaminant loads in sediments, improving water quality, enhancing biological function, increasing public awareness of water protection, developing a partnership with local leaders to restore the River, increasing public participation in identifying waterway problems, increasing governmental cooperation to remedy waterways problems, focusing media attention on the River and Its' restoration, and improving the quality of stormwater runoff. Completion of the specific objectives for each issue area spans a three year planning period

Through implementation of the New River Restoration Plan the condition of the River will become more ecologically pristine and biologically functional. By focusing on specific environmental problem areas in the New River basin and implementing precise management strategies, the water quality will improve, biological diversity will be increased and the River will be an even greater community asset. With community-wide commitment to resource protection and restoration, New River Restoration will be a success.

New River Restoration Plan

I. PROBLEM

The water quality of the New River and its tributaries has deteriorated such that many indicators of water quality do not meet criteria established by Florida's Department of Environmental Protection for waters used for recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The degradation of water quality has created ecological imbalances in the flora and fauna of the River, and represents a negative impact on the environment, health and economy of the Broward County metropolitan area.

II. OBJECTIVE

The goals of the New River Restoration Plan are to improve water quality to meet state criteria, enhance the biological diversity, and create a more pristine condition. The outcome of the Plan will be a New River System that is more ecologically functional and a major aesthetic asset to the community. To achieve these goals, the following steps will be undertaken:

1. ***Basinwide Identification and Prioritization of Environmental Issue Areas Associated with the New River***
2. ***Research and Monitoring of Prioritized Issue Areas***
3. ***Development of Management Objectives***
4. ***Implementation of Specific Action Plans***

III. RATIONALE

The New River is a focal point of activity for many commercial, recreational, urban, environmental and tourism interests in Broward County. The River and its tributaries are lined with marinas and boatyard facilities, restaurants, parks,

condominiums, private homes, as well as mangroves, pond apples, cypress and other scenic natural vistas. The national and international importance of the River is signified by Fort Lauderdale's distinction as the 'Venice of America' and the 'Yachting Capital of the World.' The River is vital to the community, and improvements in environmental quality will enhance both the economic, ecological and aesthetic values of this significant resource.

IV. RESTORATION PLAN

1. Identification and Prioritization of Sub-Basins

There are a variety of environmental problems associated with the waterways of Broward County, some of which are county-wide, others that are area specific. To better delineate these environmental problem areas, a water quality assessment of the New River was initiated in 1991. The results of that assessment, which were presented in the New River Report (1993), were used to identify the principle geographical areas associated with the New River where environmental problems exist. These areas, which are identified in Figure 1, and characterized below, are subjectively prioritized in decreasing order of critical importance to better focus and facilitate restoration efforts.

North Fork

The "North Fork" (Figure 1) is a shallow, meandering tributary of the New River extending through the northwest section of the City of Fort Lauderdale. There is minimal tidal flow within this section of the River, resulting in limited circulatory exchanges of tidal waters. Flow is also restricted by large amounts of sediment and debris (tree trunks, tires, appliances, etc.) distributed throughout the waters of the North Fork. Major construction and road activities have resulted in shoaling and reduced tidal flushing. Natural freshwater flow characteristics are further restricted in the upstream section of the North Fork by the S-33 salinity control structure that effectively eliminates freshwater inflow

from the western drainage basins. Opening of this control structure is typically limited to flooding emergencies. Other sources of water inflow include continuous groundwater inflow from the surrounding basin and from both point source and non-point source inflows of stormwater runoff.

High bacterial and nutrient concentrations, and low dissolved oxygen levels are characteristic of the North Fork water quality. Concentrations of fecal bacteria are consistently high, even during periods of low precipitation. Bacterial concentrations typically increase only during storm events, indicative of bacterial contributions from surface stormwater discharges.

Sediment samples collected and analyzed throughout the North Fork have shown consistently elevated metals concentrations and are virtually void of benthic macroinvertebrate communities. A portion of the sediment bed load consists of sludge previously deposited into the North Fork by a now decommissioned waste water treatment plant. Periodic resuspension of both the sludge and the naturally occurring sediments in the North Fork contribute to the high suspended particulate load in the water. This large particulate load decreases or prohibits light from penetrating to the bottom effectively eliminating the survivability of benthic vegetation and reducing aquatic productivity.

Las Olas Isles Area

The Las Olas Isles are a series of manmade islands located along Las Olas Boulevard in east-central Fort Lauderdale. A majority of the navigable waterways within the Isles are available to larger vessels that require ocean access with no fixed bridges. These larger vessels, many of which are inhabited and semi-permanently moored, are particularly concentrated in the western canals. The two westernmost canals, Hendricks Isle and the Isle of Venice, show consistently high levels of fecal coliform and enterococci bacteria, as well as the highest density of inhabited moored vessels (IMV's). Seasonally, bacterial levels in this area tend to be highest during the winter dry season, further indicating that the bacterial origins are not from stormwater runoff. Three years

of bacteria testing have identified that the major source of these bacteria are from sewage discharges by the IMV's (Broward County Department of Natural Resource Protection 1994).

Periodic point discharges of sewage into the Las Olas Isles canals have also occurred due to failures of the City of Fort Lauderdale's sanitary sewer force mains and lateral connections. However, this system is being replaced, re-lined, and inspected by the City. The bacterial levels have remained high in the area of IMV's despite these repairs. Continued testing will be undertaken to document improvement in water quality.

South Fork

The South Fork of the New River is composed of two drainage tributaries that join and converge with the North Fork. The South Fork receives stormwater drainage from the South New River and North New River canals.

Flow in the South New River canal is maintained chiefly by groundwater inflow, which may occur directly or into the many drainage canals that discharge into the South New River Canal. Surface runoff from low areas occurs during periods of heavy rainfall. Flow may be either to the East or West. Pump station S-13, regulates water level at the east end of the South New River Canal by controlling discharges to tidewaters. Tidewaters east of the S-13 control structure splits into the South Fork of the New River and the Dania Cut-Off Canal. The Dania Cut-off Canal flows east to join the Intracoastal Waterway just south of Port Everglades. The South Fork receives additional continuous flow from cooling waters discharged by the South Broward Florida Power and Light power plant.

Flow in the North New River Canal is maintained by releases and seepage from Conservation Areas 2 and 3, and by groundwater inflow that enters directly or from the secondary canals that discharge into the North New River Canal. Water levels in the eastern part of the canal are controlled by the Sewell Dam,

1.7 miles west of State Route 7. The canal is tidal east of the dam and joins the South Fork of the New River just east of State Road 7.

Pollutants are quickly moved downstream and out of the river system due to constant flow from the western regions of the South Fork. Thus the indicators of water quality are typically within the acceptable criteria established in the Broward County pollution code. There is a moderate amount of litter and debris in the waterways, particularly in the urban areas of the North New River canal.

The impact of runoff from the marine maintenance and boatyard facilities concentrated at the convergence of the southern tributaries along what is locally termed the "Marina Mile" is of ecological concern in the South Fork. The direct deposition of marine paint chips and residues, all containing heavy metal concentrations, has been identified to be a source of sediment contamination. Best Management Practices by boatyards have greatly reduced the amount of pollutants directly entering the River.

Intracoastal Waterway

All the basins and tributaries described above flow into the Intracoastal Waterway (ICW) where the outflow is mixed with tidal waters and discharged through Port Everglades Inlet to the ocean. The ICW also receives flow, and the contaminants contained therein, from the Middle River, the Cypress Creek Canal and other drainage canals adjacent to the coastal basins.

The chemical contaminants that are commonly found in stormwater runoff, as well as the litter and debris that are dumped into the ICW from the source canals represent the main environmental concerns.

Area Wide Issues

A problem that the entire New River system has in common is the accumulation of litter and debris in the water. Of particular concern are the household and lawn debris either dumped intentionally or accidentally into the waterways by urban residents. A wide variety of household debris including, but not limited to,

cans, plastics, lumber, appliances, tires, and furniture have been recovered in all of Broward's waterways. These items impede the flow of water, trap otherwise mobile sediments, impact fish and wildlife, and contribute to the general degradation of water quality as they decompose or corrode. Debris also lowers the aesthetic and economic value of the River. Yard clippings and tree limbs are commonly dumped in the waterways based on the conventional attitude that these items are biodegradable. While individual acts of dumping may not be construed as having an impact on water quality, taken as a whole they can, and do cause immense environmental degradation.

Urban runoff, including storm water and diffuse, or nonpoint sources of pollution, also have major impacts on the water quality of the New River. Runoff can contain high concentrations of the nutrients nitrogen and phosphorus, and enrichment of these nutrients can result in severe algal blooms. Sediments deposited into the River from runoff can become suspended and make the water look cloudy or turbid, diminishing the aesthetic and recreational qualities of the River. Deposited sediments can change the physical nature of the bottom and smother sedentary, bottom-dwelling organisms. As indicated in previous sections, these sediments are also a sink for adsorbed pollutants such as metals and organics. The occurrence of high concentrations of fecal coliform or fecal enterococci bacteria in runoff are used as indicators of pathogens and are of potential risk to human health. The prevention and control of urban runoff is thus critical to improving water quality.

2. Research and Monitoring

North Fork Research and Monitoring

In November, 1993, DNRP and the City of Fort Lauderdale began a coordinated effort to investigate and remedy sources of pollution entering the North Fork in response to the high fecal bacteria concentrations measured by

the Environmental Monitoring Division. DNRP's investigation, which focused on direct discharges, uncovered five facilities illegally dumping industrial waste into storm sewers and one facility directly discharging raw sewage. There have also been other sewage related investigations resulting in reduced sewage loads in the North Fork. The City of Fort Lauderdale's investigation, which focused on indirect discharges through storm sewers, has at this time failed to locate any illegal sanitary sewer cross-connections. However, the City continues to report extremely high levels of fecal bacteria in the storm sewers suggesting possible seepage from sanitary lines. An intensive study of the water quality in the storm sewers and receiving waters is continuing.

Consultants for the City of Fort Lauderdale Utilities are currently characterizing the chemical composition and delineating the lateral extent of the remnant sludge blanket in preparation for remedial removal. In addition, DNRP staff is evaluating the potential health effects associated with eating benthic organisms near the sludge blanket. The objective of this program is to determine if metals in the sludge are bioaccumulating in the food chain, using blue crabs and sea catfish as representative indicator organisms.

Las Olas Isles Area Research and Monitoring

To define the seasonal variability in bacterial concentrations in the Las Olas Isles area, sampling at the four quarterly monitoring stations was increased to a monthly frequency. Eight additional sampling stations were then incorporated into the sampling program to improve the spatial coverage of the area. Monthly sampling was begun in the November 1991 and continued through January 1993. In June of 1993 monthly sampling was re-initiated at selected stations throughout the Las Olas study area. Sampling will continue through at least April 1994.

The critical information gained from the monthly sampling was the consistently higher concentrations of fecal bacteria in the Isles area during the

winter dry season. In contrast, levels of fecal bacteria in other areas of the County are typically lowest during the dry season.

South Fork Research and Monitoring

Cursory analyses of sediment samples collected in the area in the summer of 1990 showed evidence of an accumulation of a variety of metals, including copper, tin and zinc. The toxicity levels for these metals were moderately high according to the EPA Sediment Quality Assessment Guidelines (SQAG) suggesting that benthic communities may be negatively impacted by the accumulations. The kinds of metals found in the sediments in the vicinity of the 'Marina Mile' are typical of those found in marine anti-fouling paints.

Area Wide Research and Monitoring

The Environmental Monitoring Division of the Broward County DNRP collects surface water quality samples at 44 sites throughout Broward County on a quarterly basis. The objective of the program is to characterize the chemical, biological and physical composition of the County's water bodies and drainage basins. Remedial measures can then be focused toward the improvement of water quality, and towards the ecological health of the system. The parameters currently monitored as parts of the program include; Fecal Coliform, Total Coliform, Conductivity, Dissolved Oxygen, pH, Salinity, Temperature, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Phosphorous, Turbidity, NH_3, and $NO_2 + NO_3$. Through this long term monitoring effort, many of the environmental problem areas described in the Plan were identified.

Identification of all known major outfalls discharging into the New River was accomplished by Broward County and the City of Fort Lauderdale as part of the application requirements for a United States Environmental Protection Agency (USEPA) National Pollution Discharge Elimination System (NPDES) storm water permit. Information was also provided as to the land use, pipe size,

drainage area, runoff coefficients, and location. In addition, an updated listing of industrial activities that may discharge stormwater was included.

3. Management Objectives and Action Plans

North Fork

Objective 1: Improve Flow Characteristics

The most immediate requirement in the North Fork is to improve circulation and flow-through characteristics of the water body. Computer modeling of flow in the North Fork is proposed as the first step in restoring more natural hydrologic conditions. Standard flow models can be used to predict the changes necessary to positively effect volumetric flow changes in the North Fork. There are four management alternatives that can readily be tested by the proposed flow modeling. First, the circulatory effects of inflow into the North Fork, occurring through a conveyance canal connected to the C-11 drainage canal, can be assessed. Second, artificial circulation and aeration created by pumps placed in series along the North Fork can be assessed. This type of activity may create sufficient artificial circulation to improve oxygenation and exchange with tidal waters. Large-scale aeration may be a cost effective means of oxygenating and circulating, at least to a minor extent, the waters of the North Fork. Third, since one of the model parameters is bottom topography, any changes in bottom topography can have a large impact on flow predictions. As such, the effects of dredging portions of the River can be modeled. Dredging activities may be particularly critical in those areas where shoaling of sediments has limited access to the North Fork for both recreation, fish and wildlife. Finally, variations of these alternatives can be modeled to determine the most suitable combination of options.

Any improvements in circulation will increase the volume of water brought to the surface for exposure to the air and sun. Both exposures help to volatilize harmful contaminants and kill bacteria. Increased flushing, circulation and

aeration will ultimately provide better water quality for fish, manatees and other aquatic wildlife. Results from the modeling program will be used to develop and propose flow regulation schedules and other alternatives to the South Florida Water Management District (SFWMD).

Specific Action Plan:

a. *Perform computer simulations of surface water flow in the North Fork to determine optimal flow characteristics by December 1994.*
b. *Propose regulatory flow changes to the South Florida Water Management. District by February 1995.*
c. *Conduct a cost/feasibility study for internal pumping/aeration by March 1995.*
d. *Produce report detailing flow options and costs by June 1995.*

Objective 2: Reduce Sludge and Contaminant Load in Sediments

A study of the sediments in the North Fork is now underway and will result in a report which will identify potential courses of action The Restoration Plan strategy is to have the City of Fort Lauderdale remove the sludge blanket to improve the quality of sediments such that benthic biological communities can be re-established.

The Florida Department of Transportation will also be removing sediments deposited during the construction of an Interstate 95 bridge crossing the North Fork.

Specific Action Plan:

a. *Review sludge blanket data/options by October 1994.*
b. *Propose action plan by October 1994.*
c. *Implement action plan by January 1995.*

Objective 3: Improve Water Quality

Along with improving circulation as previously described, some consideration of filtration is necessary. If flow is sufficient to cause exchange with tidal waters then additional filtration may not be necessary. Contaminants and particulates will naturally be removed from the system. However, if flow is not sufficient, then it may be possible to artificially filter the water utilizing the City of Fort Lauderdale's decommissioned sewage treatment plant. The facility has large clarification tanks that may be used to filter and remove suspended particulates from the River.

The Plan calls for continued investigation of point and nonpoint source discharges into the North Fork in conjunction with the EPA's NonPoint Discharge Elimination System (NPDES) stormwater management program. The continued high concentration of fecal bacteria in the North Fork and storm sewers continues to be a major public health concern. Identification and sampling of "clean" storm sewer systems may provide insight into the sources and transport of fecal bacteria in the contaminated systems. Inspections may also be performed directly on the waterway at night and during stormwater as an additional method for detecting illegal discharges.

Specific Action Plan:

a. Prepare literature review on removal of suspended particulates in riverine environments by February 1995.

b. Initiate collaborations with City of Ft. Lauderdale on determining feasibility of recommissioning treatment plant by March 1995.

c. Produce report on findings of the study by October 1995.

d. Implement report recommendations by November 1995.

e. Identify and sample 'clean' storm sewer systems by March 1994.

f. Analyze 'clean' sample data and provide interpretations by April 1994.

g. Convene a workshop to present bacteria data to consultants, utility engineers and academic scientists by June 1994.

h. Prepare scope of work for future testing by December 1994.

i. Conduct nighttime and/or rainy season inspections of waterways as needed.

Objective 4: Enhance Biological Function

The restoration of aquatic and littoral macrophyte vegetation and tree planting along the shore is important for maintaining diverse habitat opportunities for wildlife. Increased vegetative cover also aids in removing nutrients from the water and stabilizing sediments. The overall effect is that a more balanced ecosystem is created. As implementation of the Restoration Plan progresses the assumption is that water quality will improve. Furthermore, as water quality improves, natural re-vegetation will likely take place. Artificially re-planting is proposed to supplement the natural system however, artificially re-vegetating aquatic areas can be a difficult and costly undertaking. The strategy therefore, will be to determine the feasibility of macrophyte restoration and develop protocols that identify when the system is ecologically ready for such restoration.

The use of artificial substrates to provide attachment sites for macrophytes and cover for organisms will be investigated in conjunction with the macrophyte restoration plan. The viability, utility and legality of using artificial substrates in Broward will all be components of this study.

Specific Action Plan:

a. Conduct literature survey of macrophyte restoration. Survey to include; synopsis of previous restoration activities, legal requirements, costs, benefits, and recommended actions by June 1995.

b. Conduct workshop to discuss restoration alternatives by September 1995.

c. Implement recommendations by November 1995.

Las Olas Isles Area

Objective 1: Improve Water Quality

The City of Fort Lauderdale is continuing efforts to upgrade the sanitary sewer system in the Las Olas Isles area thus reducing the possibility of direct discharges of sewage into the canals. Additionally, an engineer has been assigned to the Las Olas Isles to both monitor the pump stations on a daily basis and respond to citizens' sewage complaints in a timely fashion.

In December 1993, in response to our bacterial findings, the City adopted an ordinance requiring property owners who rent dock space to IMV's to provide either permanent land-side toilet facilities, vacuum pump-out devices connected directly to the boats, or pump-outs by septage barges. Both the City and the County are continuing their water quality monitoring programs to document the return of bacterial concentrations to acceptable levels.

To help facilitate the reduction in sewage in discharges in inland waters, the State of Florida has developed a Clean Vessel Act grant program to fund marine pumpout facilities in areas of the State, including Broward County, which have been identified as having severely degraded water quality due to sewage discharges from boats. The State program provides guidelines that encourage public/private partnerships through innovative matching programs, for local governments and private marinas to apply for funding for renovation, construction, operation and maintenance of pump-out and waste reception facilities. DNRP has participated in this program and continues to provide local citizens with guidance on how to make the program work.

The intent of these programs is to ultimately improve water quality. However, if bacteria levels do not return to acceptable levels, then a county-wide program will be proposed. Concurrently, an assessment of groundwater seepage may be initiated to document groundwater quality in the Isles area. This may include an analysis of water quality characteristics and impacts of stormwaters discharged in the Las Olas area.

Specific Action Plan:

a. Monthly water quality testing (Ongoing)

b. Analysis and re-assessment of water quality one year from adoption of live-aboard ordinance. (December 1994)

c. Provide plan review on pumpout installations. (Ongoing)

d. Develop county-wide program. (As needed)

e. Prepare groundwater assessment and action plan. (As needed)

South Fork

Objective 1: Remediate South Fork Sediment Contamination

Upon documentation of the metals contamination in the vicinity of the 'Marina Mile,' DNRP collaborated with the Marine Industries Association of South Florida, to develop a "Best Management Practices" program. The objective of the program was to decrease the amount of contaminated runoff, paint, and metals discharged into the River. In addition, the International Marina Institute, with a grant from the United States Environmental Protection Agency, has produced a "Clean Marina Program" designed to inform and educate marina industry professionals, to promote the use of environmentally compatible practices, and understand regulatory compliance requirements.

A program to assess toxic 'hot spots' in the sediments of the South Fork will be implemented by DNRP in 1994. In this program, sediments from a series of stations adjacent to the "Marina Mile" will be collected and tested for toxic effects using a bioassay method. A report will then be prepared outlining the nature of the problem and recommending potential remedial measures. The information gained from this study will ultimately define the scope of a basinwide study of sediment toxicity.

Specific Action Plan:

a. Implement BMP program. (Complete)

b. Perform a mailout of BMP procedures to reiterate compliance twelve months after BMP program initiation (include Clean Water Hotline information) by January 1995.

c. Follow-up inspections to verify compliance with BMP program. (Ongoing)

d. Document BMP success/failure. (Complete)

e. Begin collection of sediments throughout the New River basin for toxicity testing by June 1994

f. Report results of sediment sampling. Identify areas with toxic sediments by December 1994.

Intracoastal Waterway

Objective 1: Improve Water Quality

Most of the intracoastal waterway is bulkheaded and lined with private homes, condominiums, and apartment buildings. Impacts to water quality are primarily derived from stormwater runoff. Therefore, improvements in the quality of the runoff will enhance water quality. Landscape improvements, such as green areas (grass) next to bulkheads are recommended to help filter and cleanse the runoff. The production of flyers, or presentations to community associations may be productive ways of informing intracoastal residents how to improve their environment.

Specific Action Plan:

a. Conduct a literature survey of landscape alternatives that improve the quality of stormwater runoff in South Florida by February 1995.

b. Produce a technical bulletin of landscape alternatives based on results of survey by April 1995.

Area Wide Objectives and Action Plans

Objective 1: Increase Awareness of Water Protection Through Public Education

The dumping of litter and debris takes place because of the public's ignorance of the ecological impacts, misinformation, or simple indifference

regarding the environment. Ignorance of impacts and misinformation can be eliminated through public awareness and environmental education programs. Perhaps the longest running waterway awareness campaign is that of the Marine Industries Association of South Florida, Inc., (MIASF) which has organized an annual waterway cleanup for the last seventeen years as part of their "Keep Our Waterways Clean" campaign. The waterway cleanup is conducted by hundreds of volunteers who remove tons of trash and debris from Broward County's waterways. This public awareness/participation event serves to directly educate and involve a range of the County's residents.

More localized quarterly cleanups organized through community homeowners' associations are being planned. Such cleanups could be part of block parties or special community holidays like the Fort Lauderdale annual birthday celebration. These cleanups provide positive public participation for a cause that directly benefits the community.

Specific Action Plan:

- *a. Financially co-sponsor the waterways cleanup. (Annually)*
- *b. Provide staff assistance and help coordinate public participation for the cleanup. (Annually)*
- *c. Continue meetings with communities through outreach programs to encourage other cleanup efforts. (Ongoing)*
- *d. Develop a brochure to encourage continuing efforts to help keep the River clean. (Complete)*

Objective 2: Develop a Partnership with Community, Business, and Government Leaders to Restore the River.

The Broward County Urban Blueway/Greenway Project is a part of the Restoration Plan because both programs have similar goals. The stated mission of the Urban Greenway program is to develop and implement plans that enhance the ecological, recreational, educational, and economic values of the New River.

Implementation of the Urban Greenway program will go on concurrently with the implementation of the Restoration Plan.

Specific Action Plan:

a. *Participate on the Greenways Steering Committee. (Ongoing)*
b. *Provide financial assistance to develop the program plan. (Ongoing)*
c. *Provide the use of DNRP technical expertise and GIS services. (Ongoing)*
d. *Coordinate assigned plan objectives. (Ongoing)*
e. *Provide office space and supplies. (Ongoing)*

Objective 3: Increase Public Participation in Identifying Waterway Problems

DNRP currently operates an environmental complaint line that provides the citizens of Broward County with 24 hour access to the Department. The response protocol can be modified such that the line also serves as a 'Clean Water Hotline.' The telephone number would remain the same, but the notion of a separate "hotline" could be publicized in such a manner as to encourage citizens to specifically report waterway problems.

Specific Action Plan:

a. *Produce a public information announcement describing the New River Clean Water Hotline by December 1994.*
b. *Track public response to the Clean Water Hotline beginning in December 1994.*
c. *Evaluate the success of the hotline and make changes as needed by June 1995.*

Objective 4: Increase Governmental Cooperation to Remedy Waterways Problems

The City of Fort Lauderdale, Broward County, City of Wilton Manors, Independent Drainage Districts, Florida Marine Patrol and other governmental and municipal entities who operate waterways maintenance departments inspect the waterways and remove trash and debris. It is proposed that DNRP coordinate an effort to expand and modify this activity through development of a Best Management Practices (BMP) Program for municipalities. The objective of the BMP program will be to instruct personnel on the identification of illegal discharges and on proper reporting procedures. Funding sources for program implementation, such as through the Florida Inland Navigation District, would be explored and presented in a workshop format.

Specific Action Plan:

a. Identify funding sources for waterway clean-up efforts. (Ongoing)

b. Identify components of a Best Management Practices program for waterways by March 1995.

c. Produce a Best Management Practices document by April 1995.

d. Convene a Waterways Management Workshop to outline the BMP program. by May 1995.

e. Review BMP programs and make changes as needed by April 1996.

f. Convene second Waterways Management Workshop by May 1996.

Objective 5: Focus Media Attention on the River and Its' Restoration

Media involvement is important for many of the preceding activities to succeed. For example, if the Clean Water Hotline is established, then it must be publicized in order to succeed. In this instance, newspaper coverage or public service radio announcements would convey the information to the community.

The production of a New River question and answer, or informational column in a local newspaper, printed either monthly or quarterly, would serve to keep a focus on issues surrounding the River and its' restoration.

Specific Action Plan:

a. *Provide new information of interest on the New River on a monthly or quarterly basis.*
b. *Develop a quarterly newsletter to be made available to the community. (Ongoing)*

Objective 6: Improve the Quality of Stormwater Runoff Through NPDES

The Broward County Code provides regulations that satisfy the compliance requirements for the NPDES permit program. The permit application requires documentation of structural/source controls for nonpoint source pollutant loadings, identification of illicit discharges and their control, and development of programs to monitor and control pollutant loads from municipal landfills, hazardous facilities, and construction sites. Finally, the permit requires development of a management strategy and implementation requirements.

Specific Action Plan:

a. *Identify major stormwater outfalls and document major characteristics. (Complete)*
b. *Develop a stormwater management plan and submit to USEPA for permit approval. (Complete)*
c. *Implement the management plan upon NPDES permit approval. (Expected by October 1994)*

4. Implementation Schedule

Table 1 lists all the performance objectives contained in the Restoration Plan, including a breakdown of specific action plans. The objectives are categorized by problem area and include approximate start dates and completion dates of each action item.

V. SUMMARY

Through implementation of the New River Restoration Plan it is assumed that the condition of the River will become more ecologically pristine and biologically functional. By focusing on specific environmental problem areas in the New River basin and implementing precise management strategies, the water quality will improve and biological diversity will be increased. With community-wide commitment to resource protection and restoration, New River Restoration will be a success.

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Broward County Department of Natural Resource Protection, October 1993. New River Study: Final Report, Technical Report Series, TR 93-06.

Broward County Department of Natural Resource Protection. 1994. Summary of Bacteriological Testing in the Las Olas Isles, July, 1993 through August, 1994, Technical Report Series, (in press).

Table 1. New River Restoration Plan

Objective	SPECIFIC ACTION PLAN	COMPLETION DATE	Status
	North Fork		
1	***Improve Flow Characteristics***		
1a	Perform Computer Simulations of North Fork to Determine Optimal Flow	**Dec-94**	Underway
1b	Propose Regulatory Flow Changes on the North Fork to SFWMD	**Feb-95**	
1c	Conduct a Cost/Feasibility Study for Internal Pumping/Aeration	**Mar-95**	
1d	Produce Report Detailing Flow Options and Costs	**Jun-95**	
2	***Reduce Sludge and Contaminant Load in Sediments***		
2a	Review Sludge Blanket Data/Options	**Oct-94**	Underway
2b	Propose Action Plan	**Jul-94**	Complete
2c	Implement Action Plan	**Jan-95**	
3	***Improve Water Quality***		
3a	Prepare Literature Review on Removal of Suspended Particulates in Riverine Environments	**Feb-95**	
3b	Collaborate with Ft. Lauderdale on Determining Feasibility of Re-commissioning Treatment Plant	**Mar-95**	
3c	Produce a Report on Findings	**Oct-95**	
3d	Implement Report Recommendations	**Nov-95**	
3e	Identify and Sample 'Clean' Storm Sewer System	**Mar-94**	Complete
3f	Analyze 'Clean" Sample Data and Provide Interpretations	**Apr-94**	Complete
3g	Convene a Workshop to Present Bacteria Data	**Jun-94**	Complete
3h	Prepare a Scope of Work for Future Testing	**Dec-94**	
3i	Conduct Nighttime and/or Rainy Season Inspections of Waterways	**As needed**	
4	***Enhance Biological Function***		
4a	Conduct Literature Survey of Macrophyte Restoration	**Jun-95**	
4b	Conduct Workshop to Discuss Alternatives	**Sep-95**	
4c	Implement Recommendations	**Nov-95**	
	Las Olas Isles Area		
1	***Improve Water Quality***		Ongoing
1a	Water Quality Testing	**Ongoing**	
1b	Re-assessment of Water Quality 1 yr. From Adoption of Live-Aboard Ordinance	**Jan-95**	
1c	Provide Plan Review on Pumpout Installation	**Ongoing**	Ongoing
1d	Develop a County-wide Vessel Inspection Program	**As Needed**	
1e	Prepare Groundwater Assessment and Action Plan	**As Needed**	

Table 1. New River Restoration Plan

Objective	SPECIFIC ACTION PLAN	COMPLETION DATE	Status
	South Fork		
1	***Remediate South Fork Sediment Contamination***		
1a	Implement a Best Management Practices Program		Complete
1b	Perform a Mailout of BMP Procedures to Reiterate Compliance	**Jan-95**	
1c	Follow-up Inspections to Verify Compliance with the BMP Program	**Ongoing**	Ongoing
1d	Document BMP Success/Failure		Complete
1e	Begin Collection of Sediments Throughout the New River Basin for Toxicity Testing	**Jun-94**	Complete
1f	Report Results of Sediment Sampling	**Dec 94**	
	Intracoastal Waterway		
1	***Improve water quality***		
1a	Conduct Literature Survey of Landscape Alternatives That Improve Stormwater Runoff Water Quality	**Feb-95**	
1b	Produce Technical Bulletin on Landscape Alternatives	**Apr-95**	
	Area Wide Objectives and Action Plans		
1	***Increase Awareness of Water Protection Through Public Education***		
1a	Financially Co-sponsor the Waterways Cleanup	**Annual**	
1b	Provide Staff Assistance and Help Coordinate Public Participation for Cleanups	**Annual**	
1c	Continue Meetings with Communities Through Outreach Participation Programs	**Ongoing**	Ongoing
1d	Develop a Brochure to Encourage Efforts to Keep the River Clean		Complete
2	***Develop a Partnership with Local Leaders to Restore the River***		
2a	Provide Financial Assistance to Develop the Program Plan	**Ongoing**	Ongoing
2b	Provide the Use of DNRP Technical Expertise and GIS Services	**Ongoing**	Ongoing
2c	Coordinate Assigned Plan Objectives	**Ongoing**	Ongoing
2d	Provide Office Space and Supplies	**Ongoing**	Ongoing
3	***Increase Public Participation in Identifying Waterway Problems***		
3a	Produce a Public Information Announcement Describing the New River Clean Water Hotline	**Dec-94**	
3b	Track Public Response to the Clean Water Hotline	**Jun-95**	
3c	Evaluate the Success of the Hotline and Make Changes as Needed	**Jun-95**	
4	***Increase Governmental Cooperation to Remedy Waterways Problems***		
4a	Identify Funding Sources for Waterway Cleanup Efforts	**Ongoing**	Ongoing
4b	Identify Components of a BMP Program for Waterways	**Mar-95**	
4c	Produce a BMP Document	**Apr-95**	

Table 1. New River Restoration Plan

Objective	SPECIFIC ACTION PLAN	COMPLETION DATE	Status
4d	Convene a Waterways Management Workshop to Outline the BMP Program	**May-95**	
4e	Review BMP Programs and Make Changes as Needed	**Apr-96**	
4f	Convene a 2nd Waterways Management Workshop	**May-96**	
5	***Focus Media Attention on the River and Its Restoration***		
5a	Provide New Information of Interest on the New River on a Monthly or Quarterly Basis	**Monthly**	
5b	Develop a Quarterly Newsletter to be Made Available to the Community	**Ongoing**	Ongoing
6	***Improve the Quality of Stormwater Runoff Through NPDES***		
6a	Identify Major Stormwater Outfalls and Document Major Characteristics		Complete
6b	Develop Stormwater Management Plan and Submit to USEPA		Complete
6c	Implement the Management Plan After NDPES Permit Approval	**Oct-94**	Pending