INTEGRATED PEST MANAGEMENT SUB-COMMITTEE

MEETING AGENDA
MONDAY, April 12th, 2021 – 2:00 P.M.
COUNCIL CHAMBERS
1225 MAIN STREET, SEBASTIAN, FL

I. CALL TO ORDER

II. PLEDGE OF ALLEGIANCE

III. ROLL CALL

IV. APPROVAL OF MINUTES **–ACTION ITEM**
March 8th, 2021 Meeting

V. ANNOUNCEMENTS

VI. PUBLIC INPUT

VII. NEW BUSINESS

VIII. OLD BUSINESS

IX. **Item A. Non-Chemical Methods Table– ACTION ITEM**
   i. Submitted for Sub-Committee Member Approval

X. **Item B. Draft Sections of Plan II-VI – ACTION ITEM**
   i. Submitted for Sub-Committee Member Approval

VIII. SUB-COMMITTEE MEMBER MATTERS

IX. STAFF MATTERS

X. ITEMS FOR NEXT AGENDA
Item A. Proposal of New Amended Meeting Schedule
Item B. 6-Month Summary of AVC Treatments
Item C. Begin Discussion of Chemical Methodology

XI. ADJOURNMENT

ANY PERSON WHO DECIDES TO APPEAL ANY DECISION MADE ON THE ABOVE MATTERS, WILL NEED A RECORD OF THE PROCEEDINGS AND MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDINGS IS MADE, WHICH RECORD INCLUDES THE TESTIMONY AND EVIDENCE UPON WHICH APPEAL IS TO BE HEARD. SAID APPEAL MUST BE FILED WITH THE CITY CLERK'S OFFICE WITHIN TEN DAYS OF THE DATE OF ACTION. (286.0105 F.S).

IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA), ANYONE WHO NEEDS SPECIAL ACCOMMODATIONS FOR THIS MEETING SHOULD CONTACT THE CITY'S ADA COORDINATOR AT (407)-589-5330 AT LEAST 48 HOURS PRIOR TO THIS MEETING.TWO OR MORE ELECTED OFFICIALS MAY BE IN ATTENDANCE.

IPM SUB-COMMITTEE
AGENDA TRANSMITTAL FORM

Board Meeting Date: April 12th, 2021

Agenda Item Title: IV. APPROVAL OF MINUTES –**ACTION ITEM**
March 8th, 2021 Meeting

Recommendation: Sub-Committee Member Approval

Background:

If Agenda Item Requires Expenditure of Funds:
Total Cost: n/a

Attachments: March 8th, 2021 Meeting Minutes

INTEGRATED PEST MANAGEMENT SUB-COMMITTEE
MINUTES OF REGULAR MEETING
COUNCIL CHAMBERS
1225 MAIN STREET, SEBASTIAN, FL
MARCH 8, 2021

I. Call to Order -- The meeting was called to order by Mr. Benton at 2:00 p.m.

II. Pledge of Allegiance was recited by all.

III. Roll call

Present
Mr. Carrano
Mr. Griffin
Mr. Stadelman -- (Zoom) Late arrival
Dr. Cox
Ms. Munroe -- (Zoom) Late arrival

Also Present:
Brian Benton, Leisure Services Director
Kim Haigler, Environmental Planner
Barbara Brooke-Reese, MIS Manager
Janet Graham, Technical Writer (Zoom)

IV. Approval of Minutes -- February 22, 2021

Chairman Benton asked if everyone had a chance to review the Minutes as presented. All indicated they had. Hearing no changes/corrections, Mr. Benton called for a motion. A motion approving the February 22, 2021 Minutes as presented was made by Mr. Carrano, seconded by Dr. Cox, and approved unanimously via voice vote.

V. Agenda Modifications

Ms. Haigler proposed an agenda modification as follows: Under New Business, Item B, Review of Proposed Extended Meeting Schedule for the Committee. Mr. Benton called for a motion to add Item B, Proposed Extended Meeting Schedule. Motion was made by Mr. Griffin, seconded by Carrano, and approved unanimously via voice vote.

VI. Announcements -- None

VII. Public Input

Bob Stephen, 150 Concha Drive, Sebastian. He thanked the Sub-Committee for its work. He asked the members to please think about their grandchildren and their children regarding these waterways. Are we going to have waterways with habitats in them? That has to be considered. He also stated that this Sub-Committee and its plans and discussions are being watched by others. Seeing no one else in chambers and hearing no one on Zoom, Mr. Benton closed Public Input on this item and moved to the next item on the agenda.

VII. New Business

A. Non-Chemical Methods Suggested at the Last Meeting

i. Discuss the pros and cons of each

Ms. Haigler reviewed at the last meeting Sub-Committee members proposed some new items to the Non-Chemical Controls tables. She researched these methods, and she wanted to discuss some of them so that everyone can understand why they would or would not be a good fit for the City's system. She began with discussing carp. It was taken out of the table, and there was some discussion that we should not count it out yet. Carp has been one of the most effective biological controls of hydrilla, but carp are not a specialist. They will eat plants until they deplete them, and they live 25 years. Their range must be restricted to get permitted from FWC for them to be used, and it requires that the connected water bodies altogether be less than 500 acres. So that and the fact that the entire stormwater system is not less than 500 acres, and it cannot be guaranteed they will not escape to the San Sebastian River or to any other natural waterways. For those reasons, Sebastian would not qualify for an FWC permit as its system is designed.

The other suggestion was stocking with native fish. There are no native fish that significantly control algae or aquatic plants. Native fish are already present and exist at carrying capacity. There is no native fish stocking that is significantly going to have any effect.

There was also mention of a dry ice system. It is a blast of dry ice. It is highly pressurized and requires specialized equipment, but it is really for small terrestrial weeds. It has to freeze to the plants' root systems, or it acts just like a cold spell on them. Understandably, that is impossible with aquatic weeds. It would not be possible to freeze the root system as they are much deeper, and the wet soil is not going to be frozen as easily as the dry soil. So that is not recommended to be added to the table.

Another system that was interesting was the DASH, the diver-assisted suction harvesting, which is where the plants and roots are sucked up by the diver and deposited on upland sites. She looked at the site factors that would qualify for this system, and it is used in fast-moving, clear waters like springs. Visibility is required, and the visibility in Sebastian's stormwater system is not very good, and as soon as they start vacuuming that really fine silt will suspend, and they will not be able to see what they are vacuuming anymore. That was the state recommendation, and it has only been used on four different waterways in Florida. It is used around docks and launch areas, but those are all private in the City's stormwater system.

Another system that was suggested was a skimmer device. There are skimmer devices that can be purchased for ponds. They are costly, but they are easily movable between ponds. They pump the water and material through, sort of like an on-shore filtration unit that has a conveyor belt which deposits all that vegetation in a pile on the shore, and then it is scooped up and taken away. It is left in place until the problem has been eliminated in that pond, and then it can be moved to another pond or it can be stored until it is needed again. There was actually an ad for it in “National Geographic." The City does not very often treat the types of floating species which this system addresses. She recommends that this be put on the "future" list because if those items become a bigger problem, the City should definitely look at this skimmer device.

She did more research into the pathogens. The pathogens and bacterial enzymes that attack are aerobic. Aeration has to be added for them to work. They already exist in soils, but you need to supplement them. So besides the aeration, it requires still water. The best candidates are ponds during periods of in- and outflow which also have fountains. So the ponds that have fountains have only been treated for cattails for the most part, and the pathogens that are added must be tailored to the exact site conditions. The City is not in an area where it is predictable. The fluctuations vary a lot, but the soils must be constantly assessed. They only treat the algae and the muck. In the two years that there are data from Applied Aquatics she counted 31 times that brush and grasses were treated, and there were 9 times that algae were treated, and that was at Hardee, which is not a lake or a pond; it is really a canal, and it has a lot of flow. The main thing she found in the research is that it is showing the same effects of the pathogens as adding aeration. Adding air is adding more of what the existing bacteria and pathogens need to grow. So it makes them more active and increases their population. Since the City has some ponds that have been treated for these items, she suggests that the first recommendation to put in the plan that is open for discussion is adding fountains to some of those ponds that do not have fountains. Then when these things become a problem, to look at increasing the pathogens. The first step to that is increasing the aeration in

these ponds, so that is why she put pathogens as a future recommendation--something to look at as the plan is reviewed every year.

Those were all the items that were mentioned at the last meeting. Ms. Haigler then called for questions/comments from the Sub-Committee members.

Mr. Griffin:

- Asked if her recommendation is that the City could have a need in the future for aeration. There are a number of ponds in which that might be applicable, ponds that there is not now aeration in. Ms. Haigler stated yes. Currently, there is aeration at Garden Club Park, Easy Street Park, the historic Schumann Lake Park, and Blossom Pond. In discussion with staff, she asked what would be the next ones that would be recommended where there are some of these pest problems. Through the research, staff looked at Periwinkle, Cheltenham, and Tulip as being the next ones that have problems with these pests. But she suggested that aeration be the first thing to use.
- Questioned Ms. Haigler if her thoughts are that much of this information, especially that which appears to be feasible or feasible in the future, is going to be included in the plan itself. Ms. Haigler explained that there is a whole section of future considerations, and she plans to discuss where these other options are going to be listed. Mr. Griffin stated that he then can develop a budget request that reflects some of those future systems so that funding can be considered for some of those so that we actually make some of them happen. Ms. Haigler stated that is how it was done in the Parks and Properties IPM Plan as well.

Dr. Cox:

- Regarding the carp, he suggested there is a need for a botanical survey. He wants to know where the hydrilla is. Is it in all parts of the system, or is it in specially located areas under certain circumstances? We really do not know. He opined that the Sub-Committee is "flying blind" when it dismisses things without being able to say that such-and-such a plan is going to be effective. He is not yet convinced that carp is a bad idea. Ms. Haigler stated she did not say it was a bad idea. It is very effective against hydrilla. But adding them into the City's system requires an FWC permit, and when she read the requirements for that permit, the City's system does not meet their requirements. Actually, carp have only been approved in 80 of Florida's public waters. Eighty is not very many. There is a long list of criteria that have to be met, which includes being an isolated water body and being able to guarantee the carp do not escape into any natural water

body, and Sebastian just does not meet those requirements. Dr. Cox stated that, since he has been told by several people that carp do work, he would like to see that there is a note in the plan that the Sub-Committee looked at carp. Some things that we look at might not work right now and may never work. But we need to know what they are so that we are not going to be criticized later by saying that we did not consider so-and-so when we did. We need to know more as time goes on.

- Regarding the probiotic suggestion, he is intrigued that Martin County and Port St. Lucie are willing to invest $100,000.00 in a machine to generate whatever it is for raw material or probiotics. He is going to pursue that on his own just to see how it works and whether it would work. He prefers not to dismiss something that may have some value. Regarding the pathogens, Ms. Haigler stated she is not eliminating them. She wants to leave them on the list for future consideration so that every year the feasibility of them is being looked at.
- Regarding diver-assisted vacuuming in a lake far away in totally different circumstances, like Lake George, it was found that in all the coves they have been overwhelmed by Eurasian milfoil. They went for years putting rubber mats down to kill it to find that it was only partially effective. For the last two or three years they have been using divers to go down with a vacuum device. This is in the shallow coves where they have been doing this, and it is the only thing that has let them get Eurasian milfoil under control. He suggested including the diver-assisted vacuuming be included in order to say that the Sub-Committee looked at this, and it is not something that was dismissed out of hand. Ms. Haigler stated there are several methods that are options that have been eliminated because they do not fit our stormwater system.
- He appreciates all the work that Ms. Haigler is doing regarding these matters.

Mr. Carrano:

- Stated that a few years ago when he spoke with a company who did diver-assisted suction harvesting, visibility was not a concern because they normally worked in zero visibility conditions. As soon as you start suctioning anyplace or anywhere, you kick up so much sediment that you cannot see. If that is a problem because we could be kicking sediment downstream, he understands that. But if it is stated to be a problem because the divers cannot see, they set up guidelines and that is not an issue. Ms. Haigler stated that was in the data that she read. She said that the data said that it was only recommended in the springs: fast-moving, clear waters.

Regarding the carp question, Sebastian is not isolated as its waterway system is

designed presently. In the future, who knows what can happen, but right now the City's water system is not designed to hold carp within the system

Mr. Benton asked Ms. Haigler if there is a contact that staff can contact at FWC to discuss with them the carp scenario. That way we at least have some documentation that we can then say in this IPM that we have documentation on file that shows that carp would not be approved in our system. Ms. Haigler stated that can be done.

Mr. Benton asked Dr. Cox that, in his mentioning probiotics, he said that in Martin County and Port St. Lucie probiotics have been shown to be successful. Dr. Cox said yes. Mr. Benton asked if Dr. Cox knows how much those entities reduced their spray contracts by due to the success of the probiotics. Dr. Cox said he does not know, but he will ask about that. Mr. Benton asked if those entities were able to provide any recent data or any baseline data. Dr. Cox said no, but he will follow up on that. Dr. Cox recalled that the person he spoke to said that the $100,000.00 invested in the machinery to do this is a worthwhile investment. Dr. Cox will follow up on that also. Ms. Haigler added that with this device it involves dedicated staff because they have to be raised and inoculated into the system daily. There being no further questions/comments from Sub-Committee members, Mr. Benton opened the meeting to public input on this item.

Bob Stephen, Sebastian. Regarding Item A, all the discussion has been on the negatives, and he asked where are the positives. He suggested a roundtable with some scientists and people who have done successful things to teach us what works, and then try the things that work instead of calling attention to what does not work so that spraying can be continued. Nothing was said about steam or about mechanical methods. Mr. Benton interjected that there was a long discussion and PowerPoint presentation at the last meeting showing the mechanical method that the City used. There being no one else in chambers and no one on Zoom who wished to speak, Mr. Benton closed public input and moved to the next item on the agenda.

B. Proposed Extended Meeting Schedule

Mr. Benton stated that the previous meeting schedule expired as of this meeting. Staff is proposing to continue these meetings, to be continued through the beginning of May. The next dates will be March 22nd, April 5th, and May 3rd. The second meeting in April is being skipped because that is close to the time of the Arbor Day and Earth Day celebration, and Ms. Haigler has a lot of responsibility surrounding that event, as well as some of the members of this Sub-Committee. Mr. Benton called for a motion. A motion extending the meeting schedule as outlined above until May 3rd was made by Mr. Carrano, seconded by Mr. Griffin, and approved unanimously via voice vote.

VIII. Old Business

A. Section II, Structures

i. Review and discussion

Ms. Haigler reviewed that this item was first proposed two meetings ago, and it was decided to break it down in order to move a little slower with each section. At this meeting she would like to address structures. The stormwater assets classified as structures include the dams, weirs, spillways, catch basins, baffle boxes, culvert pipes, inlets, outlets, outfalls, etc. There are over a hundred structures like this across the stormwater system, and these assets have virtually zero tolerance for pests. They need to stay clear of vegetation and debris at all times in order to function. The do-nothing option on this means that the operation of the management structures can be interfered with. Each one is unique in its design and purpose, so the overgrowth of vegetation around these structures can impede the flow of water, block the gates open or closed, and often when the operation of these structures is most critical is when this happens. The damage caused to the structures and the resulting problems can become very costly to repair. In order to eradicate the vegetation, the following cultural and mechanical methods are conducted routinely as part of standard proactive maintenance procedures, which are vacuum removal and manual removal. She described these methods and how often these methods are performed. Mr. Benton then asked for comments/questions from Sub-Committee members.

Dr. Cox:

- Regarding non-chemical methods for structures, he suggested adding a sentence that says, "Reconstruction where the structure is found defective or past its efficient use, and it should be replaced with a better-designed structure." He cited the example of what is being done at the Concha Dam. He asked if that should be put in here, or does that language belong somewhere else. Ms. Haigler stated that is more of a stormwater master plan item to replace the infrastructure. She stated there is no way to build it that it will have the capacity to handle vegetation, that it would not get blocked by vegetation. Mr. Griffin stated the structure at Concha Dam is planned to be replaced as it is near its end of life. Mr. Benton stated that language can be included here. He emphasized that it is not something that the City would do unless the structure's useful life has run out or other means have caused it to decay. Ms. Haigler added that this was one of the items that were

listed in a lot of research she did regarding aquatic plants around these structures. As these structures are replaced, the replacements are completely different because of technology, etc. Mr. Griffin stated he will consider that comment as the City moves forward with the Concha Dam project. He stated that hopefully that project will be funded this year, and the Stormwater Department will move forward with it.

- Dr. Cox stated that in his earlier notes, he added backhoe for manual removal. Mr. Griffin stated that the principal piece of equipment used for mechanical removal is a track hoe, of which the City has three sizes. The City also has an excavator that is part of a skid steer, which gets inside the smaller ditches. Basically, it is functioning as an excavator, but sometimes a backhoe is used.

Mr. Benton suggested adding mechanical removal to the other two non-chemical methods. Ms. Haigler stated she would add that.

Mr. Carrano:

- He stated that when looking at these structures such as dams, weirs, and spillways, he cannot imagine ever spraying chemicals anywhere near any of those because, by the time it is sprayed, it is downstream already. The easiest and quickest way to remove vegetation that gathers upon these structures is going to be some sort of mechanical, by-hand removal. Vegetation near those structures will have to be removed cyclically in some way. Ms. Haigler stated that at some of the inlets and outlets at the ponds, there is no way to reach them, as there is private property involved. Mr. Carrano stated that some of these structures are old and need to be repaired. They are too small, they catch sediment. He understands the cost, but he suggested that some of them were not designed properly, and if they were bigger and improved, there might not be the need for spraying. Mr. Griffin stated that 100% of the time the staff is using mechanical removal on these structures. He cited a history of an accident when an excavator was attempted to be used at the Concha dam, which caused a massive failure of the dam, massive flooding, lawsuits against the City, and a very expensive and difficult reconstruction project. Mr. Benton emphasized that chemical spraying at any structure is very minimal, and it is only done when it is deemed a safety hazard for potential flooding if the Concha dam area gets a heavy rain, etc. Mr. Griffin stated the mechanical removal works very well for the catch basins, baffle boxes, and many other structures, and it is done all the time. The progress is monitored and reported to the City Manager and to City Council as well. Mr. Carrano stated it should be emphasized in implementing this plan that certain structures do not lend themselves to spraying except under extreme circumstances. Mr. Benton stated

that verbiage would be added and will come back to this group for final approval.

Mr. Benton, hearing nothing more from the Sub-Committee members, opened the meeting to comments from the public. There being no one in chambers and no one on Zoom, Mr. Benton moved to the next item on the agenda.

B. Section IV, Ponds

i. Review and discussion

Ms. Haigler reviewed that there are 17 stormwater ponds throughout the City. Pond vegetation is important ecologically and has an aesthetic benefit with the ponds. If left to grow uncontrolled, the flood control and safety of the properties surrounding them can be impaired. The do-nothing option can very quickly reduce the stormwater capacity more than any other body of water. That is because the brush and grasses that grow in from the shoreline can quickly accumulate the sediments in the ponds. The invasive aquatic vegetation grows quickly, and it is constantly shedding vegetation. Native vegetation does not do that like the invasive vegetation does. All of the stormwater ponds are connected to the entire conveyance system, and the aquatic vegetation can also block the waterflow in and out of the ponds. Many species of tall grasses growing around the pond edges can create dense thickets which hide dangerous wildlife and prohibit police and park visitors from seeing beyond them. This creates serious safety concerns because of the dangerous wildlife that can hide in those thickets. Four of the City's ponds also contain fountains for aeration and algae control. The dense vegetation can damage the fountains by clogging their pump systems or blocking the spray. So the tolerance threshold for pest activity before action is taken is considered high for these assets. She clarified that what was meant by stating "before action is taken" means before spraying is begun.

Ms. Haigler reviewed that the primary non-chemical methods for use in the ponds is dredging when the ponds are at their lowest levels so the City can access the ponds' bottoms and edges with equipment to mechanically remove the vegetation and accumulated sediment. Ms. Haigler stated there is mechanical removal by a contractor when needed. The fountains can cause a lot of circulation, which is great for the whole pond in a number of ways. It inhibits vegetation growth significantly and increases the habitat quality. Planting native emergent vegetation is another way where the sod goes right up to the edge of the water. Putting in a buffer of vegetation helps maintain a healthy shoreline as well as acts as a filter and reestablishes and enhances the habitat and aesthetic quality of the ponds. Mr. Benton called for questions/comments from the Sub-Committee members.

Mr. Carrano:

- inquired if it is possible in this section to separate those ponds that are isolated from actual bodies of water from those that are connected to natural bodies of water. Ms. Haigler said no ponds are connected to natural bodies of water. They are all connected to the interconnected stormwater system. There are no ponds that have a direct outfall to the San Sebastian River. Mr. Griffin stated they are all part of the stormwater system which exits to the canal, which exits to the river.

Dr. Cox:

- Questioned some text in the overview where it says there are dozens of ponds, and he referred to Ms. Haigler stating today that there are 17 ponds. Ms. Haigler clarified what was meant, and she has since revised the text to say there are 17 stormwater ponds.
- Regarding the planting native emergent vegetation, he stated in the context of ponds he thinks it will work; in the bigger context such as along the sides of the canals, this is a major human resources endeavor, to keep planting native vegetation and hope that it overtakes the non-native, invasive species. Mr. Griffin suggested that for effective plantings it is a combination of timing and selection of the right herbicides with the timing and selection of the right natives. It is a coordinated, multiple phase approach. He believes it can work. He stated that one of the goals with the large grant that has been applied for in terms of reconstructing the canal is that high-quality native vegetation be established on both sides of the canal that would be self-maintaining. Part of the vision that stormwater staff has is building a littoral shelf. He further stated that grant money would be necessary for the work that the City hopes to do. The grant application that he put in for is a $24 million project. He is hoping to hear soon about that. Ms. Haigler added that creating a littoral shelf has been successful in some of the City's waterways. She stated it is a very tedious job and is its own specialty. Thus, staff defers to the professionals on this subject.
- Regarding the pond on the north side of Schumann Drive and U.S. Highway 1, that pond has a fountain in it for aeration. Two residents have photographs that show a serious bloom of what Dr. Cox thinks is blue-green algae. Despite the aeration, it took over the top of that pond and produced all sorts of problems. Mr. Griffin stated he would take a look at it. Ms. Haigler stated that when aquatic macrophytes are removed algae take over as the primary producer. That is just a natural effect, and depending on the size of the water body, it is expected naturally to balance back out. Even if you mechanically remove it, algae take over as the primary producers, but it balances out within a week. Dr. Cox stated that all of the cattails

around it died. He is not sure whether they died naturally or they were sprayed with something. So all of the cattails around that pond do not look healthy. Ms. Haigler said that is the problem with invasive vegetation like the hyacinths. That vegetation is constantly growing and dying and dying and growing and throwing off this dead organic material. That is one of the problems with them and why they need to be controlled. Mr. Benton stated that what was in the Historical Park pond on the north side of Schumann was identified as planktonic algae, which are microscopic plants that live in pond water and are extremely important to the aquatic ecosystem. It is the basis for the food chain and is essential because it produces oxygen and food for the animals that live in the pond. It was identified as not being blue-green algae.

Hearing no further comments/questions from the Sub-Committee members, Mr. Benton opened the meeting for public input on this item alone.

Bob Stephen, Sebastian. He stated he has photos of the Schumann Drive pond, and he can send them to Mr. Benton if he wants to see them. He stated that three scientists he talked with in the Department of Health all agreed that this was probably a blue-green algae bloom, but because of the rapid temperature drop at night it goes to the bottom. It comes up quickly and is fed by herbicides, and it was a milky green, a rather strange appearance. Mr. Benton asked that Mr. Stephen send the photos or copies of the photos to him. Ms. Haigler stated she visited the day after that was reported She saw a variety of algae but no blue-green. Mr. Stephen said blue-green algae comes from algae. Mr. Carrano stated no, it does not. Blue-green algae are bacteria. Algae are not. Seeing no one else in chambers who wished to speak and hearing no one on Zoom, Mr. Benton moved to the next item on the agenda.

IX. Sub-Committee Member Matters -- None

X. Staff Matters -- None

XI. Items for the Next Agenda

A. Section V, Ditches/Rights-of-Way/Dry Retention Areas
B. Section VI, Further Non-Chemical Recommendations

XII. Adjournment

There being no further business, Mr. Benton called for a motion to adjourn. A motion to

adjourn the meeting was made by Mr. Griffin, seconded by Mr. Benton, and approved unanimously via voice vote. The meeting was adjourned at 3:02 p.m.

By:_____ Date:_____

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IPM SUB-COMMITTEE
AGENDA TRANSMITTAL FORM

Board Meeting Date: April 12th, 2021

Agenda Item Title: VIII. OLD BUSINESS
Item A. Non-Chemical Methods Table
i. Submitted for Sub-Committee Member Approval

Recommendation: Sub-Committee Member Approval

Background: Originally submitted to the sub-committee and approved at December 12th, 2021 Meeting. Modifications were made at the February 22nd meeting.

If Agenda Item Requires Expenditure of Funds:
Total Cost: n/a

Attachments: Complete Table of Non-Chemical Methods recommended for current or future use

BIOLOGICAL, CULTURAL, AND MECHANICAL CONTROLS

	Control Method	Vegetation Type	Asset Classification	Description	How to Implement	Currently in Use?
BIOLOGICAL	**Pathogens**	Limited	All	some plant pathogens, such as bacteria, enzymes, or fungi, can stress aquatic plants – commercially available pathogens(bioherbicides) are under research evaluation	Usually combined with herbicides to provide more effective long-term control. Requires areas of still water and is often paired with direct aeration	No
CULTURAL	**Always Mow with Sharp Blades**	Emergent	Ditches	Dull mower blades cause uneven cutting and weaken the grass blades. Vegetation along sloping shorelines is crucial to shoreline stabilization and the prevention of sediment and nutrient laden runoff entering the waters.	Ensure that staff sharpens all mower blades on a consistent schedule and when necessary. The City and the contractor has the tools and trained staff to accomplish this.	Yes
	Minimizing Nutrient Inputs	All	All	Reducing the amount of Nitrogen and Phosphorus entering the conveyance system to the maximum extent practicable.	Ferilizer Ordinance, NPDES Compliance, erosion control ordinance and inspections, BMAP participation, stormwater park ponds, resident outreach.	Yes
	Native Shoreline Plantings	Emergent	Ponds, Canals	Native shoreline plantings will attract natural predators, prevent the establishment of invasive aquatics, filter water entering the water, and support a healthy aquatic ecosystem.	As the budget allows or in working with local non-profit groups begin to introduce more plantings of florida freshwater shoreline natives to our accessible shorelines.	Yes
	Maintain Updated Chemical and Fertilizer Application Equipment	All	All	Maintaining updated chemical and fertilizer application equipment is necessary to adhere to the label requirements for applications to ensure equipment is calibrated. Updated motorized equipment cleans more efficiently, calibrates and hold calibration more accurately and deteriorated parts can be easily replaced.	Staff will stay up-to-date on the equipment and ensure that equipment is replaced as necessary to ensure the correct calibrations are applied per the label. Staff will also maintain servicing all parts necessary as recommended from the manufacturer.	Yes
	Direct Aeration	Algae	All	Bottom-up hypnolimnetic aeration provides oxygen for microorganisms to more efficiently break down muck and nutrients, effectively reducing algal growth. Also can prevent fish kills in small ponds. Aeration is especially helpful in water bodies with limited circulation	Would specifically be reccommended at structural choke points where muck accumulates and used in correlation with the addition of pathogens.	No
	Fountains	Algae	Ponds	Fountains help move the water from the pond's surface to the bottom. Aeration by the fountain oxygenates the water, keeping hydrogen sulfide gas from collecting at the bottom and ultimately, significantly reducing the amount of this gas in the pond. Effectively reduces algae, duckweed and watermeal.	Many ponds already have fountains installed. Future addition of fountains in other ponds is advisable where site conditions are favorable.	Yes
	Mow at Correct Height	All	Ditches	Mowing shoreline vegetation at the correct height will ensure that we promote healthy grass and maintain shoreline stabilization	Ensure that staff and contractors are not mowing the shoreline grasses so short that it poses a risk to the plant and root health	Yes
	Tool Sanitation	All	All	Pests can easily spread among sites on unsanitized equipment. Many aquatic pests multiply easily from small pieces of vegetation. Cleaning mowers, tractors, and equipment between areas minimizes pest transport.	Stormwater Staff and contractors must wash down and clean all equipment as frequently as possible, especially when leaving areas with pest problems.	Yes
MECHANICAL	**Dredging/ Excavation**	All	Canals, Ponds, Ditches	Plants and sediments are removed- increases water depth,restores storage capacity, and removes nutrient rich sediments. Ideal for highly impacted areas.	Heavy equipment requires broad access path to areas. This is not for natural areas as the turbidity is greatly incresed and nutrients are released into water column	Yes
	Manual Weed Pulling	Emergent	Structures	Where safe and applicable, manual weed eradication will involve staff manually pulling weeds.	Areas where it is safe and applicable can have manual weed eradication.	Yes
	Vacuum Removal	All	Structures	A vacuum truck is utilized by City staff to remove all accumulated sediments and vegetative debris from all catch basins	Staff cleans out these structures regularly and keeps record of how much debris is removed.	Yes
	Mechanical Removal	All, except duckweed, watermeal	Ponds, Canals, Some structures	Removal of vegetation by specially designed aquatic harvesters. Cut vegetation is removed and piled on shoreline for disposal. This process must be repeated throughout the growing season to maintain control. This process disturbs the sediments in the substrate and is non-selective, often removing fish and other fauna in the process. This method can be very costly.	Only about 50% of the City's canal system is accessible by this type of equipment and most of the shoreline is privately-owned with very limited access for piling and removing the cut vegetation. This method is reccommended when the location and cost are feasible,	Yes
	Skimmer Device	Duckweed, Watermeal, Azolla	Ponds	Large device that requires electricity and is easily movable between ponds. which is effective in removing small floating vegetation.	Water and material are pumped into an onshore filtration unit. Vegetation is piled onto shoreline by conveyor, then must be manually removed off site.	No

IPM SUB-COMMITTEE
AGENDA TRANSMITTAL FORM

Board Meeting Date: April 12th, 2021

Agenda Item Title: VIII. OLD BUSINESS
Item B. Draft Sections of Plan II-VI
i. Submitted for Sub-Committee Member Approval

Recommendation: Sub-Committee Member Approval

Background: Originally submitted to Sub-Committee for final approval at February 8th, 2021 Meeting, in which it was decided by consensus that deeper review was needed. Further discussion and edits were discussed at the past three meetings.

If Agenda Item Requires Expenditure of Funds:
Total Cost: n/a

Attachments: Sections II, III, IV, V, and VI of the SW IPM Plan

II. STRUCTURES

Overview

Stormwater assets classified as "structures" includes all **dams**, **weirs**, **spillways**, **catch basins**, **baffle boxes**, **culvert pipes**, **inlets**, **outlets**, and **outfalls**. There are over 100 such structures across the stormwater system. These assets have a virtually zero tolerance for pests; they must stay clear of vegetation and debris at all times in order to function.

Do Nothing Option

There are numerous ways that aquatic plants can interfere with the operating of water management structures, as each structure is unique in its design and/or purpose. Overgrowth of aquatic vegetation around and within these structures can greatly impede the flow of water, block gates opened or closed, often when the operation of these structures is the most critical. These structures are often critical to flood control during major rain events. The damage caused to the structures and by the resulting flooding problems can become very costly to repair. Therefore, the tolerance threshold for pest activity, before action is taken is considered the very low for these assets.

Non-Chemical Methods

In order to eradicate vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** Sediments can build up at outfalls and create a substrate for vegetation to establish. At times of low outfall, City staff may clear the outfall areas with equipment to mechanically remove any vegetation and accumulated sediments.
- **Vacuum Removal.** A vacuum truck is utilized to remove all accumulated sediments and vegetative debris from catch basins and baffle boxes as needed.
- **Manual Removal.** When safe and practicable, vegetation will be removed by hand from structures as part of routine inspections.
- **Replacement of Structures.** Structure design has been modified over time to be more resistant to pest establishment and damage. The defective or aging structures should be replaced with these upgraded versions, when applicable.

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III. CANALS

Overview

Stormwater assets classified as "**canals**" include the entire interconnected system of wide, mostly sea walled waterways. Altogether, the City maintains over 9 miles of canals and **seawalls**. It is acknowledged that aquatic vegetation provides an important ecological function in the canals. However, the City must be careful that the storage and flow capacity of these important waterways is protected.

Do Nothing Option

The overgrowth of aquatic vegetation within the canal system can greatly impede the flow of water, crucial for flood control throughout the City. The canals are also frequently utilized for kayaking and fishing. These recreational opportunities are hindered when dense vegetation blocks access and affects the habitat quality by altering the water's chemistry and decreasing light penetration.

Finally, and most importantly, the canal system has multiple direct outfalls to the St. Sebastian River (SSR). Any vegetation that is not properly maintained in the canal system is easily introduced into this State protected freshwater system. For this reason, Florida Statute 369.22 (Appendix V) requires that all public and private water owners enact a "maintenance program" for aquatic vegetation. Therefore, the tolerance threshold for vegetation growth, before action is taken is considered moderate for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** When areas of the canal system are at their lowest storage, the City can access the canal bottoms with equipment to mechanically remove the vegetation and accumulated sediments.
- **Mechanical Removal by Contractor.** During periods where invasive vegetation has spread too extensively at a location to be brought back under control by routine methods, a contractor may be hired with the equipment to cut and remove the vegetation by boat.
- **Sediment and Erosion Control at Development Sites.** In compliance with City Ordinance No. 54-3-11.2. (Appendix X) and the City's MS4 **NPDES** Permit (Appendix Y), proper erosion and sediment control at all sites of development is required to be established and maintained throughout the duration of the project and is inspected regularly for compliance. Sediments directly washing off a site, and into the canals created a mound of substrate for vegetation to establish and carry nutrients which many invasive species thrive on.

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- **Planting Native Emergent Vegetation.** In areas of the canal where seawalls are not installed, maintaining a healthy, natural shoreline of native vegetation will help prevent the pest vegetation from re-establishing and enhance the habitat and aesthetic quality of the waterways.

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IV. PONDS

Overview

There are 17 stormwater ponds throughout the City. These include all of the ponds located within City parks, as well as the interconnected ponds of the **Stormwater Park**, and the multiple ponds of the Day Drive **Retention Area**. Pond vegetation provides an ecological as well as an aesthetic benefit. If left to grow uncontrolled, however, the flood control and safety of these properties can be impaired.

Do Nothing Option

Overgrowth of aquatic vegetation in the ponds can very quickly reduce their stormwater storage capacity, especially in the smaller ponds. This accelerated **succession** can cause localized flooding problems in a very short time.

All of the stormwater ponds are connected to the entire stormwater conveyance system. Aquatic vegetation can block the water flow in and out of the pond. Many species of tall grasses growing around the pond edges can create dense thickets which readily hide dangerous wildlife and can prohibit police and park visitors from seeing beyond; this creates a serious safety concern. Four of the City's ponds also contain a fountain for **aeration** and algae control. Dense vegetation can damage the fountains by clogging the pump system or blocking the spray. The tolerance threshold for pest activity, before action is taken is considered high for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system:

- **Excavation.** When all or parts of the ponds are at their lowest storage, the City can access the pond bottoms and edges with equipment to mechanically remove the vegetation and accumulated sediments.
- **Mechanical Removal by Contractor.** During periods where invasive vegetation has spread too extensively at a location to be brought back under control by routine methods, a contractor may be hired with the equipment to cut and remove the vegetation by boat.
- **Fountain Aeration.** A fountain installed in the center of the pond provides water circulation and increases the dissolved oxygen of the water. This inhibits vegetation growth and increases the habitat quality for aquatic animals as well.
- **Planting Native Emergent Vegetation.** Maintaining a healthy, natural shoreline of native vegetation will help prevent the pest vegetation from re-establishing and enhance the habitat and aesthetic quality of the pond.

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V. DITCHES, RIGHTS-OF-WAY, DRY RETENTION AREAS

Overview

The stormwater conveyance system is an expansive spider web connected by a massive 80 mile network of **ditches**. Within the ditches, vegetation assists with the infiltration of the water through the soil and stabilizes the steep banks. However, the growth of vegetation must also be controlled enough to preserve the flow of the entire stormwater system.

Along-side many of the City's water retaining assets are the **rights-of way** areas such as designated access roads and drainage easement buffer zones. In these areas, groundcover is important to stabilize the soil from erosion; however, it is critical that the vegetation not become so overgrown that it blocks maintenance access to the ponds, canals and ditches.

Dry retention areas are located throughout the City and they are areas of lower elevation, which only hold water during periods of heavy rainfall. They are designed to overflow excess water into nearby water features through catch basins and pipes. Keeping dry retention areas vegetated is important to preventing compaction and increasing water infiltration. Too much vegetation can decrease the storage capacity and block the flow of stormwater towards other features.

Do Nothing Option

The overgrowth of aquatic vegetation around in the ditches and dry retention areas can eventually decrease their storage capacity, creating localized flooding problems. The ditch vegetation can cause very costly blockages in the road crossing culvert pipes. Many of the ditches bisect blocks of residential lots and an overgrowth of woody vegetation from the ditches threatens utility and residential structures. Overgrowth in rights-of-way areas prevents staff and contractors from performing proper maintenance of structures, canals, ponds, and ditches. The tolerance threshold for pest activity, before action is taken is considered very high for these assets.

Non-Chemical Methods

In order to control vegetation, the following cultural and mechanical methods will be conducted routinely as part of standard proactive maintenance procedures within the City's stormwater system. These assets are virtually never treated with herbicides. The City maintains a separate mowing contract (Appendix Z) to address the control of vegetation in these areas:

- **Excavation.** When the ditches are at their lowest storage, the City can access the ditch bottoms with equipment and mechanically remove the vegetation and accumulated sediments.
- **Sediment and Erosion Control at Development Sites.** In compliance with City Ordinance No. 54-3-11.2. (Appendix X) and the City's NPDES Permit (Appendix Y), proper erosion and sediment control at all sites of development is required to be established and maintained throughout the duration of the project and is inspected regularly for

compliance. Sediments directly washing off a site, and into the ditches create a mound of substrate for vegetation to establish and carry nutrients which many invasive species thrive on. These sediments can travel with stormwater and enter the canals as well.

- **Mowing.** The City maintains a contract for mowing of all right-of-way areas and ditch banks. Mowing the ditch banks reduces the self-seeding of the pest vegetation while still allowing the vegetation to remain established as it plays an important role in stabilizing the banks and filtering nutrients and sediments.
- **Mow at correct height.** Mowing to low can thin out and starve the vegetation and mowing too high or not often enough can facilitate the further spread of the plants.
- **Always mow with sharp blades and Sanitize Tools.** Dull mower blades cause uneven cutting and weaken the grasses. Vegetation can easily spread among sites by hitchhiking seeds and plant fragments on un-sanitized mowing and maintenance equipment. Cleaning these tools between areas minimizes pest transport.

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VI. FURTHER NON-CHEMICAL RECOMMENDATIONS

Future Considerations

In addition to the cultural and mechanical pest control methods currently being implemented within the City's stormwater conveyance system, observations of the areas and sub-committee member research prompted the following recommendations for future consideration *(Figure 4):*

- **Seawall Reconstruction.** **Seawalls** border most of the City's canal system. The seawalls stabilize the canal banks and help hold back nutrient laden run-off from residential and commercial landscapes, forcing it to filter downward through the soil profile before entering surficial or ground waters. In many areas the seawalls are damaged and/or failing and in need of replacement.
- **Skimmer Device.** Large device that requires electricity and is easily movable between ponds. Water and material are pumped into an onshore filtration unit which is effective in removing duckweed, water meal, azolla, but not larger aquatic plants. Should these species become a frequent problem in the ponds, the purchase of this device is recommended.
- **Expanded Dredging of Open Water Areas.** **Dredging** of canal, pond, and ditch bottoms to de-muck the nutrient rich deposits that comprise the top layer of the **substrate** and remove seawall sediments, which readily accommodate **emergent** vegetation growth
- **Environmental Enhancements.** Creation of a self-maintaining **littoral shelf** with native aquatic vegetation, which will provide healthy habitat and nutrient filtration.
- **Pathogens.** The control of some pest vegetation can be aided by aerobic pathogens, such as specific bacteria or fungus, which are amended to the pesticides or the water itself. While these bio herbicides are currently under research and review, many studies have shown that when partnered with added aeration, they may help provide more effective long-term control. It is also recommended that the pathogens be added fresh daily which will also require specialized equipment and dedicated staff. The best candidates for this method are small to medium sized ponds, during periods of very little in/outflow, which have existing aeration.
- **Stormwater Fee Credits.** Utilize the existing Stormwater Fee Credit Program to incentivize private property owners to install a **buffer zone** of emergent vegetation along stormwater ponds and natural canal boundaries. Also, enhanced outreach efforts could increase participation in the existing program.

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