



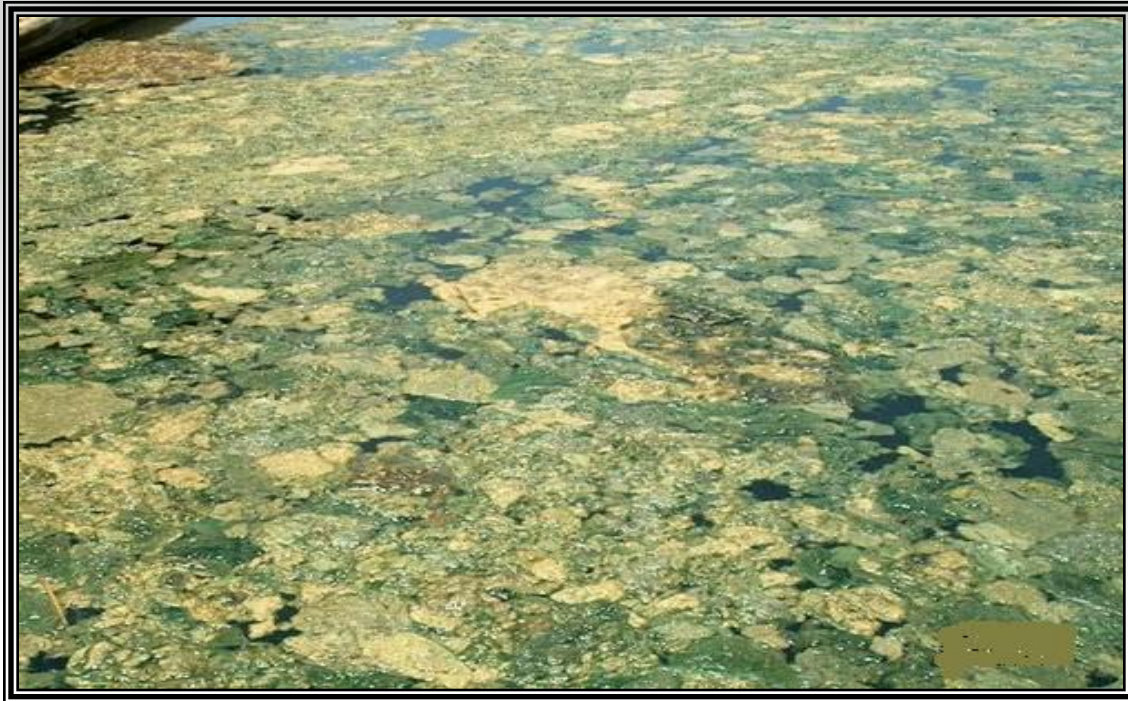
Lowering use of Copper Sulfate without Losing Effectiveness

Gaining Control of the Uncontrollable

Patrick A. Simmsgeiger
President / CLM
Diversified Waterscapes, Inc.
Laguna Niguel, CA

Lyngbia Quick Facts

- Cyanobacteria – Genus Lyngbia
- Related to Anabaena, Microcystis, Oscillatoria, Nostoc etal.
- Blue Green Algae
- Occupies Riparian & Littoral Zones

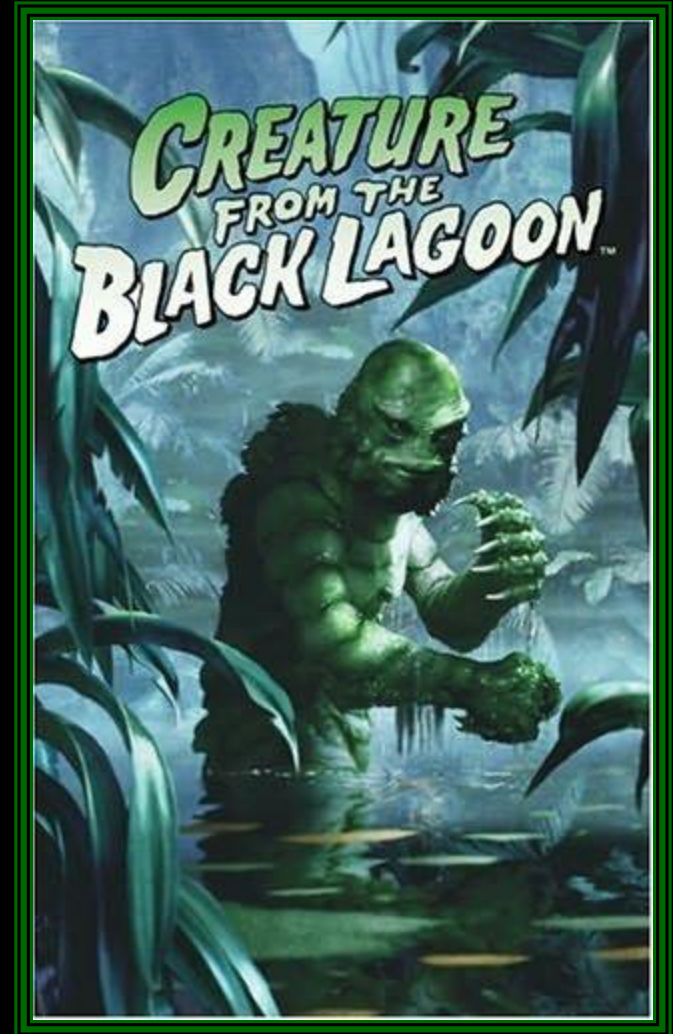


Lyngbia Quick Facts

- ✱ Feeds on nutrients in soil / sludge, oftentimes out-competing desirables**
- ✱ Highly Invasive – Multiplies Rapidly**
- ✱ Forms multi-layered filamentous mats with a characteristic green-grey-black color**
- ✱ Produces toxins commonly known for their dermatotoxic activity which cause inflammation of the skin and are also potent tumor promoters**
- ✱ Grows the on bottom then peels and floats to the surface in huge mats and sometimes covers nearly 100% of the surface**

Effects of Lyngbia

- ✱ Creates unhealthy ecosystem
- ✱ Creates unsightly appearance
- ✱ Causes odors
- ✱ Generates complaints and concerns from customers (if it doesn't attack them first!)



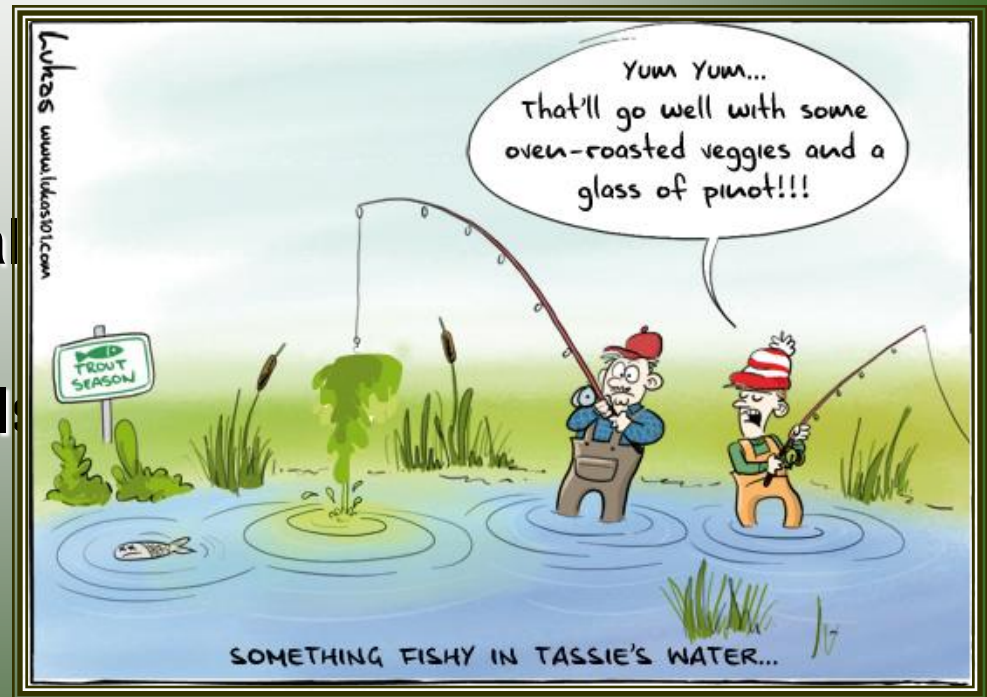
Effects of Lyngbia

- ✿ Devaluates property values
- ✿ Generates concern over contractor / applicator competency
- ✿ Loss of revenue or profitability
- ✿ Termination of contracts



Control Options

1. **Mechanical or Physical**
 - a. Harvesters
 - b. Nets / Hand removal
2. **Chemical / Biological**
(bacteria, enzymes)
3. **Natural**
 - a. Fish
 - b. Plants



CASE STUDY

Project: Desert Willow CC Palm Desert CC

- ✿ Lake # 10 Mountain Course
- ✿ Age: approximately 10 years old
- ✿ Size: approximately 8 surface acres



Project: Desert Willow CC Palm Desert CA

- ✿ Average Depth: 8 feet
- ✿ Located at the lowest end of 2 – 18 hole Championship Golf Courses
- ✿ 3 Water sources: Well, City and Reclaimed
- ✿ Water pumped into main lake at the top of the first 18 hole golf course (Fireside) then runs down a creek through both courses into lake 10 which is an aesthetic reservoir between two fairways. All drainage on this property flows into the creek which ends up in lake 10 carrying a high nutrient load.

Project: Desert Willow CC

Palm Desert CA

- ✿ Late 1999: contracted to manage Lakes. Cattails had overtaken many lakes and streams. The systems hadn't been treated since the inception. Contracted lake company was unlicensed and is no longer in business
- ✿ Spring 2000: cattail removal program begins. Heavy outbreak of sago pondweed and algae. Easily controlled with F-30, reward and non-ionic surfactant.
- ✿ Spring 2001: Sago pondweed shows up in manageable quantities. Against will of DWI, city demands all weeds eradicated.

Project: Desert Willow CC Palm Desert CA

- Late summer 2002: Small amounts of *Lyngbia* appear.



Project: Desert Willow CC Palm Desert CA



- ☀ Late Spring 2003: Lyngbia rears ugly head and comes back in full force. Physical removal and heavy copper treatments take place. The customer is unhappy and DWI is operating in the **RED**.

Project: Desert Willow CC

Palm Desert CA

- ☀ Late Spring 2004: repeat of 2003. Customer is unhappy and DWI STILL operating in the RED.
- ☀ Late spring 2005: Lyngbia shows up again. Tank mix of F-30 Algae Control, F-55 Bio-Zyme and copper applied. Lyngbia significantly reduced and held at bay for 3 weeks.
- ☀ Early July 2005: approximately 60% of the Lyngbia reappears. Tank mix of F-30 Algae Control, F-55 BioZyme and copper applied at a lower rate. Lyngbia under control for several weeks. Re-growth mass significantly reduced.

Treatment: F-30 Algae Control + F-55 BioZyme +Copper



Project: Desert Willow CC Palm Desert CA

- ❁ **Late August 2005: Lyngbia returns in smaller volume. Treated and now under control.**



Project: Desert Willow CC Palm Desert CA

- ✱ **Fall and winter of 2005 & 2006: perimeter of lake treated every other week with F-50 Bio Pure and F-55 BioZyme. The goal was to bring the soil/sludge to a healthy condition.**



Project: Desert Willow CC

- ✿ Early Spring 2006: water lilies and sago pondweed planted. New growth observed a few weeks later. 5 light Lyngbia treatments in 4 months occur. Customer now happy and DWI operating in the **BLACK**.



OVERVIEW

- ✿ 2002: First signs of Lyngbia
- ✿ 2003: Major outbreak. Everyone unhappy
- ✿ 2004: Repeat of 2003
- ✿ 2005: Use of chemicals and biologicals—
control obtained.
- ✿ 05-06: Biologicals used throughout winter.
Total control obtained. Everybody
happy. Zero complaints all season.

SUMMARY

To gain control of Lyngbia the following rates were used:

2.5 gallons F-30 Algae Control /Acre

+

2 Gallons F-55 BioZyme / Acre

+

24 lbs. CuS04 / Acre

=

SUCCESS

MAINTENANCE

- ✿ 1 lb. **F-50 BioPure** bacteria / Acre Biweekly
- ✿ 51 ounces **F-55 BioZyme** /Acre - Biweekly
- ✿ **F-30 Algae Control + F-55 BioZyme + CuSo4.** Spot treat as needed



OUTCOME

✿ 80% REDUCTION IN COPPER USE
















✿ NOTED COST SAVINGS

✿ INCREASED PROFITS

✿ CUSTOMER SATISFACTION

EVERY PROBLEM SHOULD HAVE A SOLUTION

Environmentally Safe Products

PROBLEM	SOLUTION	INITIAL DOSAGE	MAINTENANCE DOSAGE	AVAILABLE SIZES	
<ul style="list-style-type: none"> Unightly Foam Surface Scum 	 <p>F-10 Foamkill</p> <ul style="list-style-type: none"> Environmentally Safe Immediate Results Non-Oily Blend of Silicone Compounds 	<ul style="list-style-type: none"> Non-Toxic & Non-Killing Use as Much and as Often as Needed Apply Until Foam Dissipates 	Apply Directly to Foam	Apply As Needed Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon	
<ul style="list-style-type: none"> Murky Water Dirty Water Cloudy Water 	 <p>F-20 Enviro Clear</p> <ul style="list-style-type: none"> Clears Water Virtually Overnight Polymer Based Flocculent Binds Together Suspended Particles 	<ul style="list-style-type: none"> Agitation is Necessary 	 	Use 1.5 - 3 gal per 1 acre ft to achieve 5.0 - 10.0 ppm Use 0.75 - 1.5 gal per 1 acre ft to achieve 2.5 - 5.0 ppm Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon	
<ul style="list-style-type: none"> Algae -Planktonic (Pea Soup) -Filamentous (String) Chara Nitella 	 <p>F-30 Algae Control</p> <ul style="list-style-type: none"> EPA Approved for Drinking Water Safe for Use with Fish Works Great in Hard Water Organic Chelators Keep Copper from Falling Out 	<ul style="list-style-type: none"> Same Effectiveness Yet Lower Percentage of Metallic Copper 	 	Use 1 gal per 1 acre ft to achieve 0.4 ppm Use 0.5 - 1 gal per 1 acre ft to achieve 0.2 - 0.4 ppm Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon	
<ul style="list-style-type: none"> Unattractive Water Color Too Much Sunlight 	 <p>F-40 Enviro Blue</p> <ul style="list-style-type: none"> Long Lasting Screen Out Excess Sunlight Highly Concentrated 	<ul style="list-style-type: none"> Appealing Color Safe for Fish, Plants, and Waterfowl 		Use 0.25 - 0.5 gal per 1 acre ft Adjust to Your Desired Color Use 0.25-0.5 gal per 1 acre ft Apply As Needed Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon	
<ul style="list-style-type: none"> Unwanted Contaminants (Hair, Oil, Fats, Starches) Muck Clarity 	 <p>F-50 Bio Pure</p> <ul style="list-style-type: none"> Digests Sludge, Plant and Animal Waste Breaks Down Starches, Hairs, Proteins, Fats, Oils, and More Begins to Work within Thirty Minutes of Application 	<ul style="list-style-type: none"> Controls Odors Reduces Phosphates and Ammonia Environmentally Safe, Non-Toxic to Fish and Plant Life Cold Water Blend Effective Above 32° 	Week 1: Use 29 oz per 1 acre ft Week 2: Use 10 oz per 1 acre ft Week 3: Use 6 oz per 1 acre ft Week 4+: Use 2.75 oz per 1 acre ft	2.5 lb. Jug 4 X 2.5 lb. Case 25 lb. Pail	
<ul style="list-style-type: none"> Sludge Organic Waste Odor 	 <p>F-51 Sludge Reducing Pellets</p> <ul style="list-style-type: none"> Eliminates Odor Causing Contaminants Can Be Used In Bio-Filters 	<ul style="list-style-type: none"> 10X the Concentration Use in Almost Any Type of Water Your Sludge Solution Fast Acting 	Use 3 lbs. per 1000 sq ft Site Specific 2-4 Applications per Season	5 lb. Jug 4 X 5 lb. Case 25 lb. Pail 50 lb. Box	
<ul style="list-style-type: none"> Odor Chemical Imbalance Organic Contaminants 	 <p>F-55 BioZyme</p> <ul style="list-style-type: none"> Fast Acting Breaks Down Organic Contaminants, Fats, and Oils Improves Water Clarity and Quality Reduces or Eliminates Unpleasant Odors 	<ul style="list-style-type: none"> Enhances Water Quality Stimulates Indigenous Bacteria Works with F-30 to Speed Biological Process 		Week 1: Use 73 oz per 1 acre ft Week 2 - 4: Use 36 oz per 1 acre ft Week 5+: Use 18 oz per 1 acre ft	Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon
<ul style="list-style-type: none"> Too Much Green Too Much Blue Unattractive Water Color 	 <p>F-X Night Shade</p> <ul style="list-style-type: none"> Highly Concentrated Non Toxic Appealing Color 	<ul style="list-style-type: none"> Mix with F-40 for a Gun Metal Blue Color 		Use 0.25 - 0.5 gal per 1 acre ft Adjust to Your Desired Color Use 0.25 - 0.5 gal per 1 acre ft Apply As Needed Quarts 30 Gallon 1 Gallon 55 Gallon 2.5 Gallon Totes 5 Gallon	

**4 Step Program....
Kill it, Chop it, Drop it, Eat it**





Algae Man will be visiting you soon!

Diversified Waterscapes Inc.

