

# MICROBE-LIFT®

# Cycles Fish Ponds Fast

## Understanding The Nitrogen Cycle & Your Pond!



Gaseous nitrogen into the air  
**Nitrogen Gas (N<sub>2</sub>)**

### Denitrification

The reduction of nitrate in filtered pond anoxic zones

**MICROBE-LIFT/PL** (already added in step #1) contains denitrifiers that function without oxygen. These select microbes can remove pond nitrates by converting nitrate to nitrogen gas that bubbles harmlessly into the atmosphere under the anoxic conditions in pond filters and biofilms.

**2 steps to speed the removal of organic waste, ammonia and nitrate for a clear, clean, nontoxic pond!**

**Fish Waste plus Uneaten Food Protein & Dead Plant Matter**  
Broken down by the pond biology and ammonia is released

**step #1: add MICROBE-LIFT/PL**

Speeds the removal of all organic waste matter in ponds by adding a select group of microbes that increase the rate of organic breakdown and improve filter performance.

**step #2: add ML/NITE-OUT II**

Provides the necessary nitrifying bacteria (*Nitrosomonas sp.*, *Nitrobacter sp.* and *Nitrospira sp.*) required for the biological nitrification process and also assures continued removal of toxic ammonia!

**Nitrate (NO<sub>3</sub><sup>-</sup>)**

A food source for plants and algae

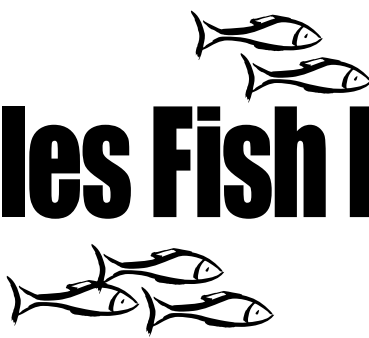
**Nitrobacter sp. & Nitrospira sp.**

**MICROBE-LIFT/NITE-OUT II** (already added in step #2) provides the necessary *Nitrobacter* and *Nitrospira* bacteria required for the oxidation of nitrite to nitrate in the pond filter!

**Nitrosomonas sp.** (contained in **ML/NITE-OUT II**) converts ammonia to **Nitrite (NO<sub>2</sub><sup>-</sup>)**

Manufactured by  
**Ecological Laboratories INC.**  
Providing Aquatic Solutions Since 1976

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# MICROBE-LIFT® Cycles Fish Ponds Fast

## MICROBE-LIFT®/PL & MICROBE-LIFT®/Nite-Out II

is the only *natural* pond treatment program to cycle and balance your pond fast using a safe, microbial, non-chemical biological process which *naturally*: controls and eliminates waste organic matter; enhances water quality; and, reduces and controls toxic ammonia, nitrite and nitrate *as simple as 1, 2, 3!*

**Just follow these simple steps.**

**Step #1:** Add MICROBE-LIFT®/PL to your pond to break down and degrade all waste organic matter, assuring an improved environment for aquatic life and plants. MICROBE-LIFT®/PL seeds pond water, filters and establishes necessary bio-films in filters and on pond surfaces removing unwanted waste matter and clarifying pond water *fast!* MICROBE-LIFT®/PL will also reduce and eliminate any pond odor.

As the organic waste matter in your pond—i.e., dead plant life, excessive fish food, and fish waste—is broken down by pond biology, the waste matter is converted to ammonia in a process called *Ammonification*. As the ammonia levels build in your pond, it can become toxic to fish and marine life and must be biologically removed *quickly*. *Nitrification*—the natural, biological ammonia removal process—is done by a group of microbes called *nitrifying bacteria*. Nitrifying bacteria are very slow to grow (requiring as much as 18 hours for a single cell division compared to every 45 to 60 minutes for waste degraders) and often require weeks to naturally develop the necessary population to convert all the ammonia produced in your pond.

**Step #2:** Use MICROBE-LIFT®/Nite-Out II to quickly establish the necessary nitrifying cultures and the ammonia removal process in your pond. Just add MICROBE-LIFT®/Nite-Out II and these cultures will grow and convert the toxic ammonia to nitrite, and then to nitrate. MICROBE-LIFT®/Nite-Out II also contains *Nitrosomonas*—which convert ammonia to nitrite—and *Nitrobacter*—which convert nitrite to nitrate.

In addition, you should know the term *Carbonate Alkalinity* because the biological nitrification process that removes toxic ammonia from your pond in order for it to cycle properly requires a source of inorganic carbon. It takes 7.1 pounds of carbonate alkalinity for every pound of ammonia removed from your pond water. If carbonate alkalinity is *not* available in pond water, it's just like your car running out of gas! The nitrification process will stop, or may not even get started. To ensure toxic ammonia is removed by the necessary nitrifying bacteria, you must test your pond water for adequate carbonate alkalinity until there is a minimum of 50ppm. Then add MICROBE-LIFT®/Nite-Out II to ensure rapid and complete ammonia removal by the nitrifying microbes.

## MICROBE-LIFT®/PL & Denitrification

MICROBE-LIFT®/PL provides a real value to your pond's environment. In addition to being one of the BEST products you can use to speed the biological removal of unwanted, slow-to-degrade organic matter from your pond environment, the novel cultures in MICROBE-LIFT®/PL assist in the removal of nitrate from pond water via a process called *Denitrification*.

While some pond nitrate is removed by plants and partial water changes, the most effective way to control nitrate removal is by biological denitrification. In this process, nitrate removal takes place in the anaerobic areas, such as those found in pond filter bio-films. MICROBE-LIFT®/PL cultures are also *denitrifying microbes* that provide an important nitrate removal pathway assisting in the removal of nitrate via denitrification. MICROBE-LIFT®/PL includes high-rate denitrifiers that convert nitrate to nitrogen gas under an anaerobic condition that exists in filters and pond surface bio-films, reducing the nitrate level in your pond. It is noteworthy that algae can use nitrate as a nutrient.

**MICROBE-LIFT®/PL and MICROBE-LIFT®/Nite-Out II are the answer to a *Natural, Clean, Clear NON-TOXIC Pond Environment!* You can rely on these two novel, biological products to enhance water quality by removing slow-to-degrade waste matter, and removing and controlling ammonia, nitrite and nitrate via their natural, non-chemical biological process.**