West Coast Salmon Summit

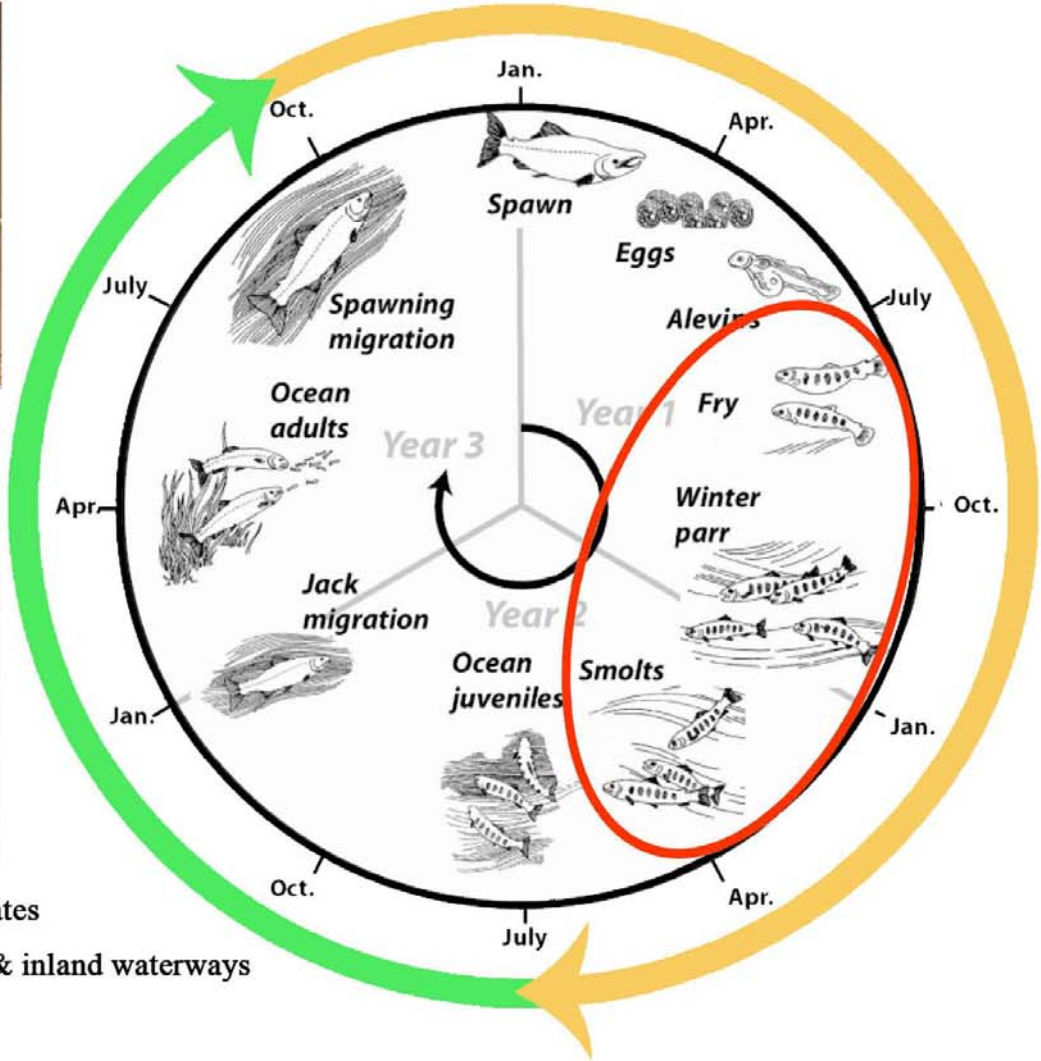
North Bend, OR

Leo Kuntz

Tidegate Specialist
Nehalem Marine Manufacturing
Nehalem, Oregon

May 16- 17, 2013

Coho Salmon Life Cycle

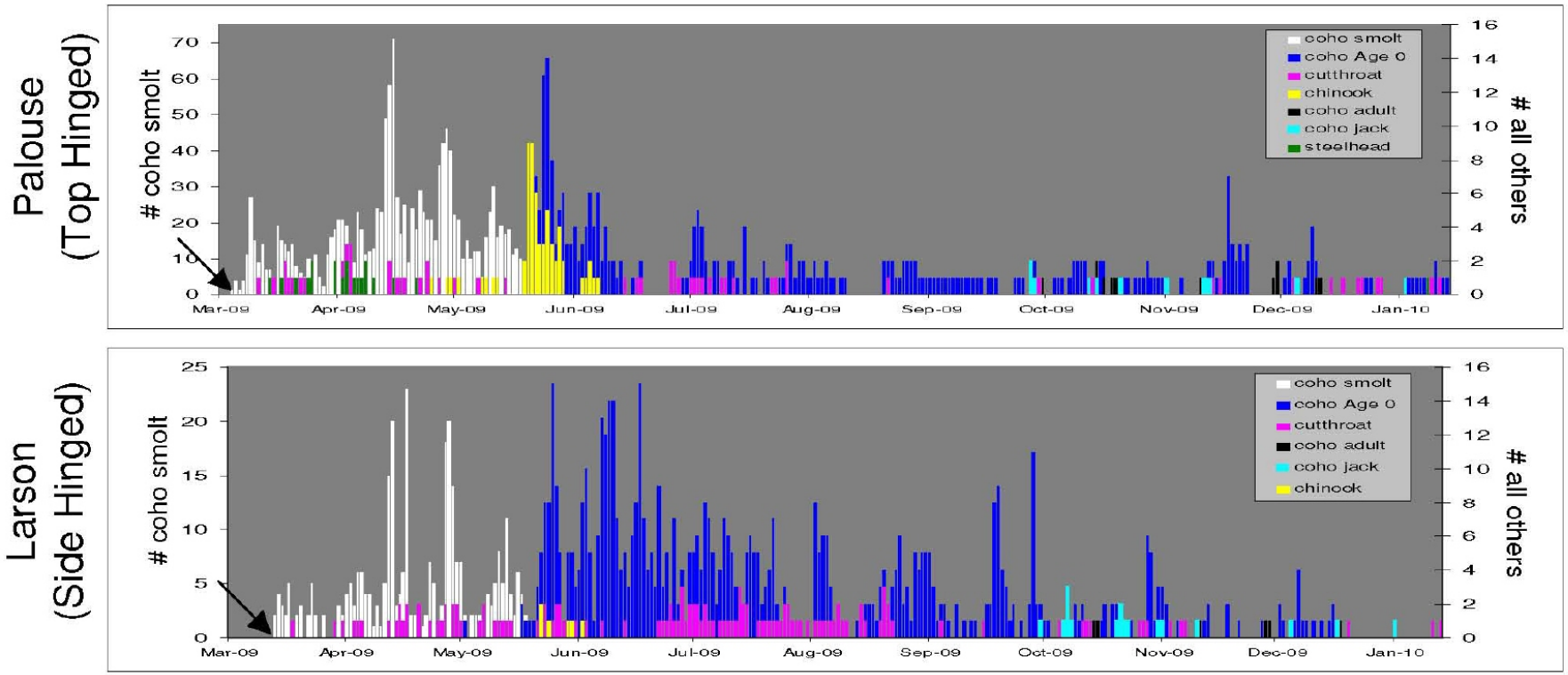


Lifecycle time spent within tidegates

Lifecycle time spent in estuaries & inland waterways

Lifecycle time spent in the ocean

Salmonid Presence at all Sites



Graphs of fish movement through tidegates at Coos Bay, OR

(Credits: Arthur Bass, Guillermo Giannicico, Coos Watershed & OSY)

Overall common results in OCTH:

OCTH Salmonids grow much faster, survive much better and provide a higher ratio of returning spawning results.

Juvenile Salmonoid Off Channel Tidal Habitat Study Sites

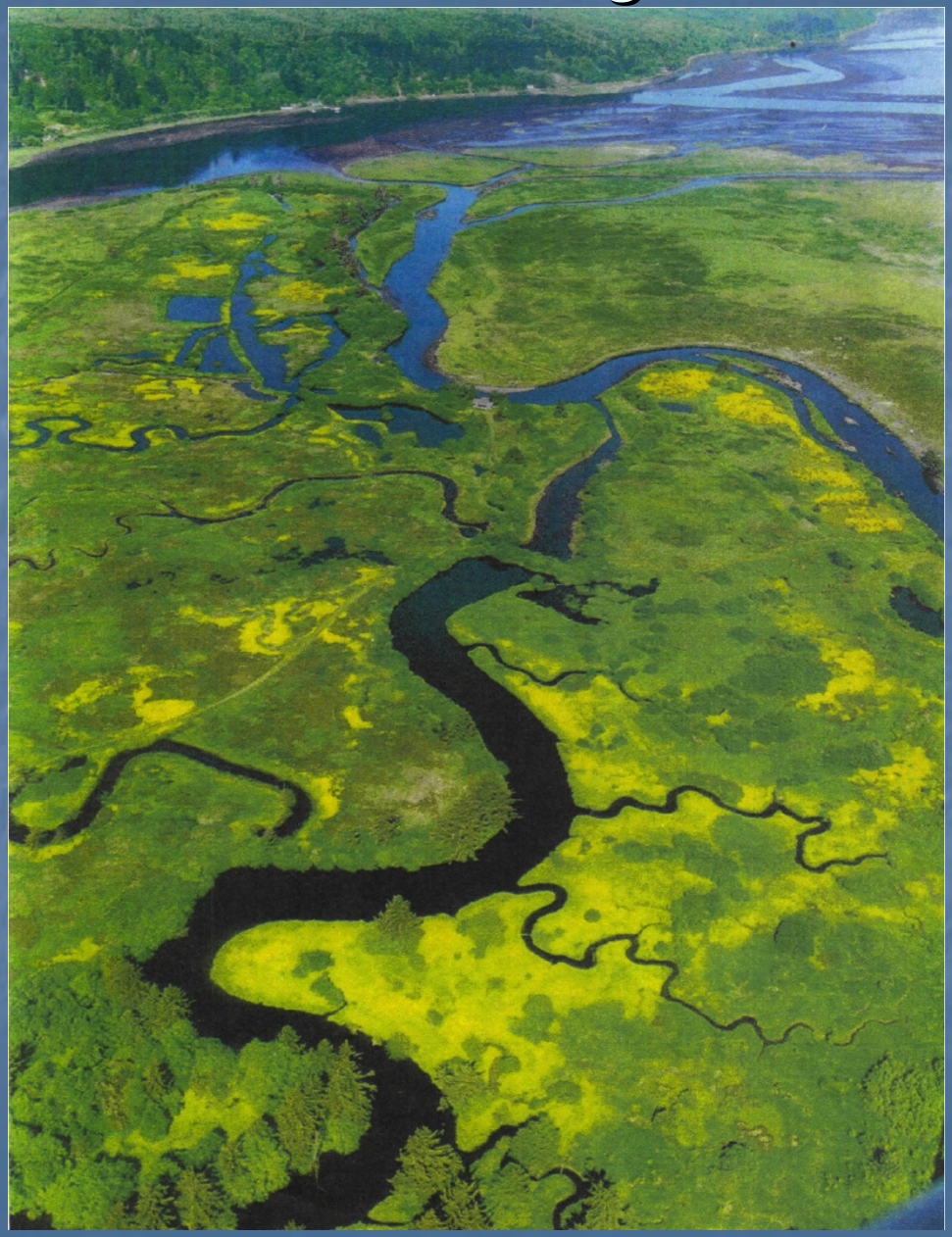
(OCTH)

Blind Slough

A beautiful example of

OCTH

(Off Channel Tidal Habitat)



Blind Slough

What a typical disconnected Oregon Coast OCTH looks like.

A Tidegate System From the Past

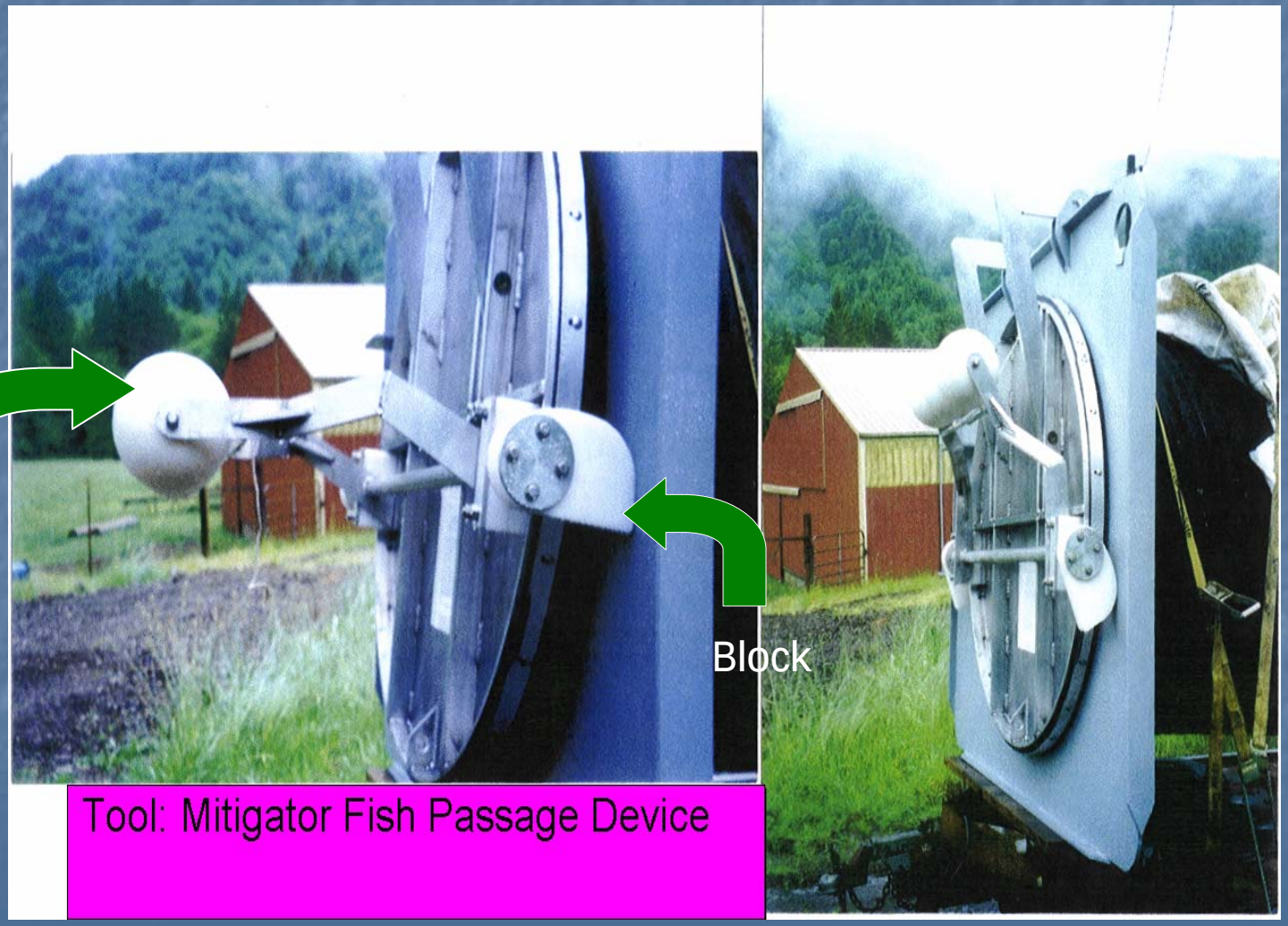
The old Cast Iron tide gate system were extremely poor for both fish passage and conveyance because the weight to size ratio is extremely high.

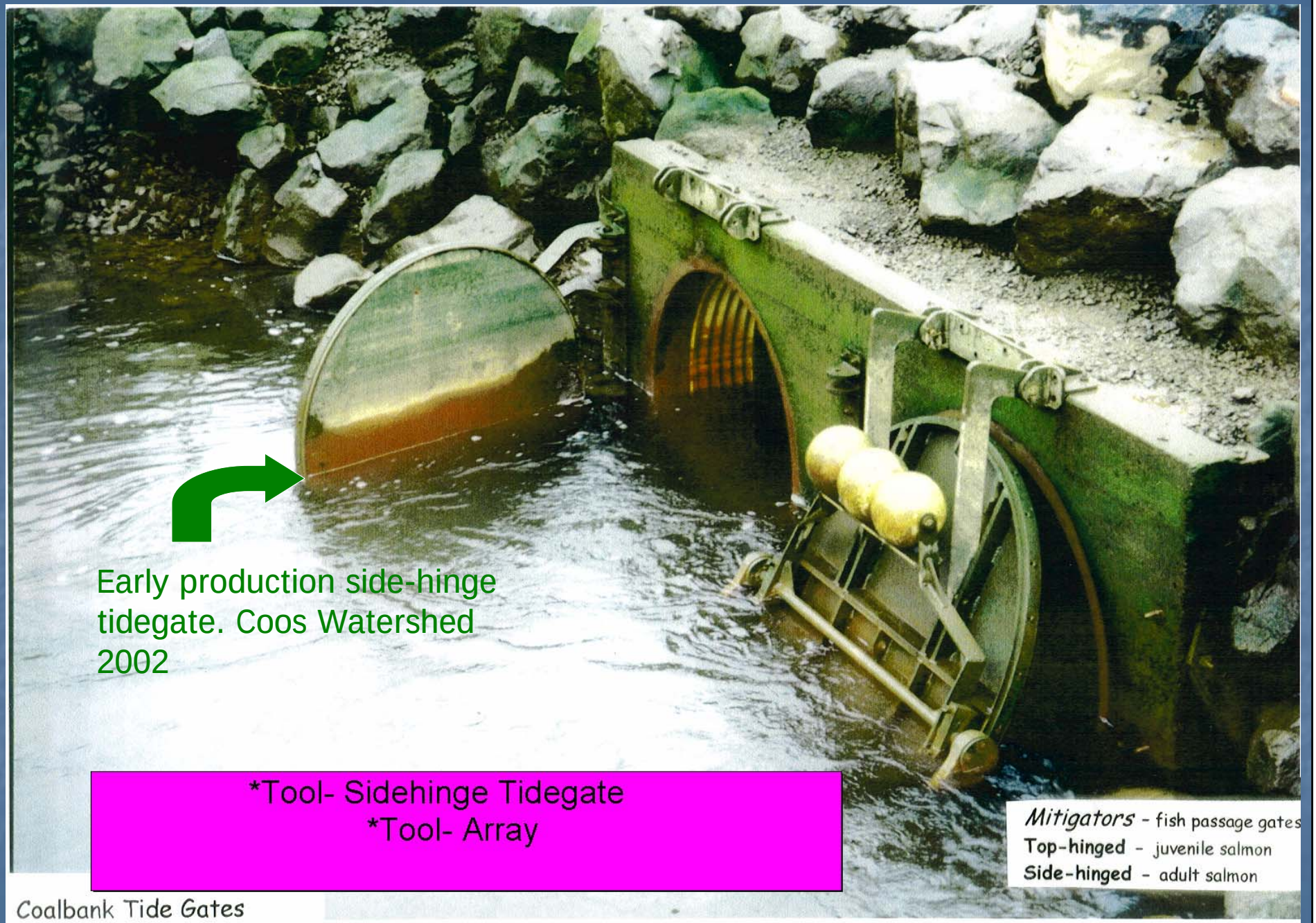
One of our early lightweight aluminum tidegates.

(Pictured: Don Reynolds, Tillamook Bay NEP 1998)

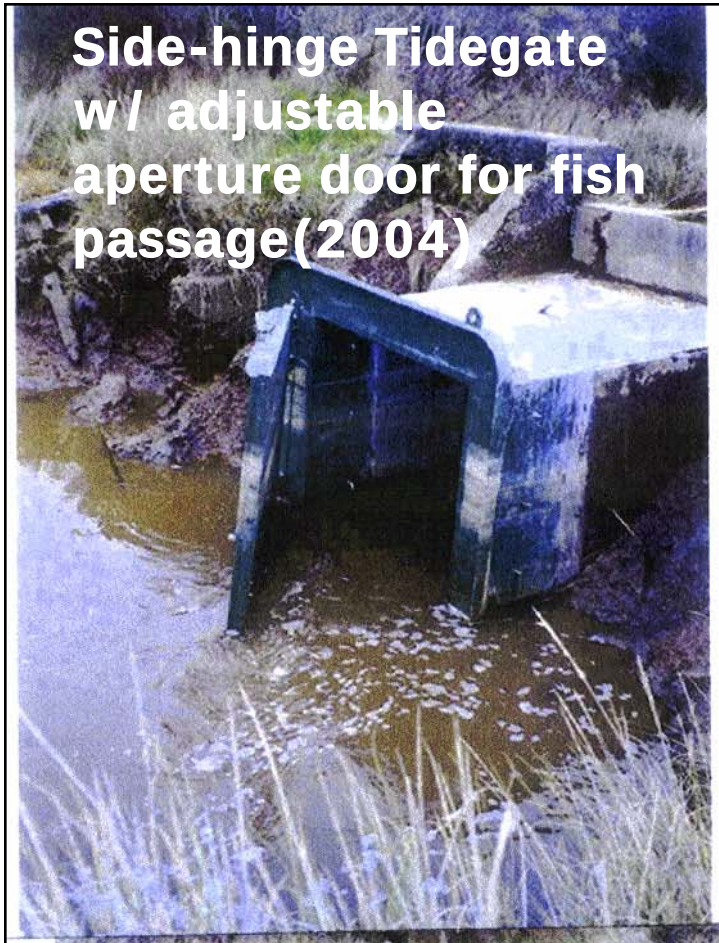
An early fish passage device (1999).

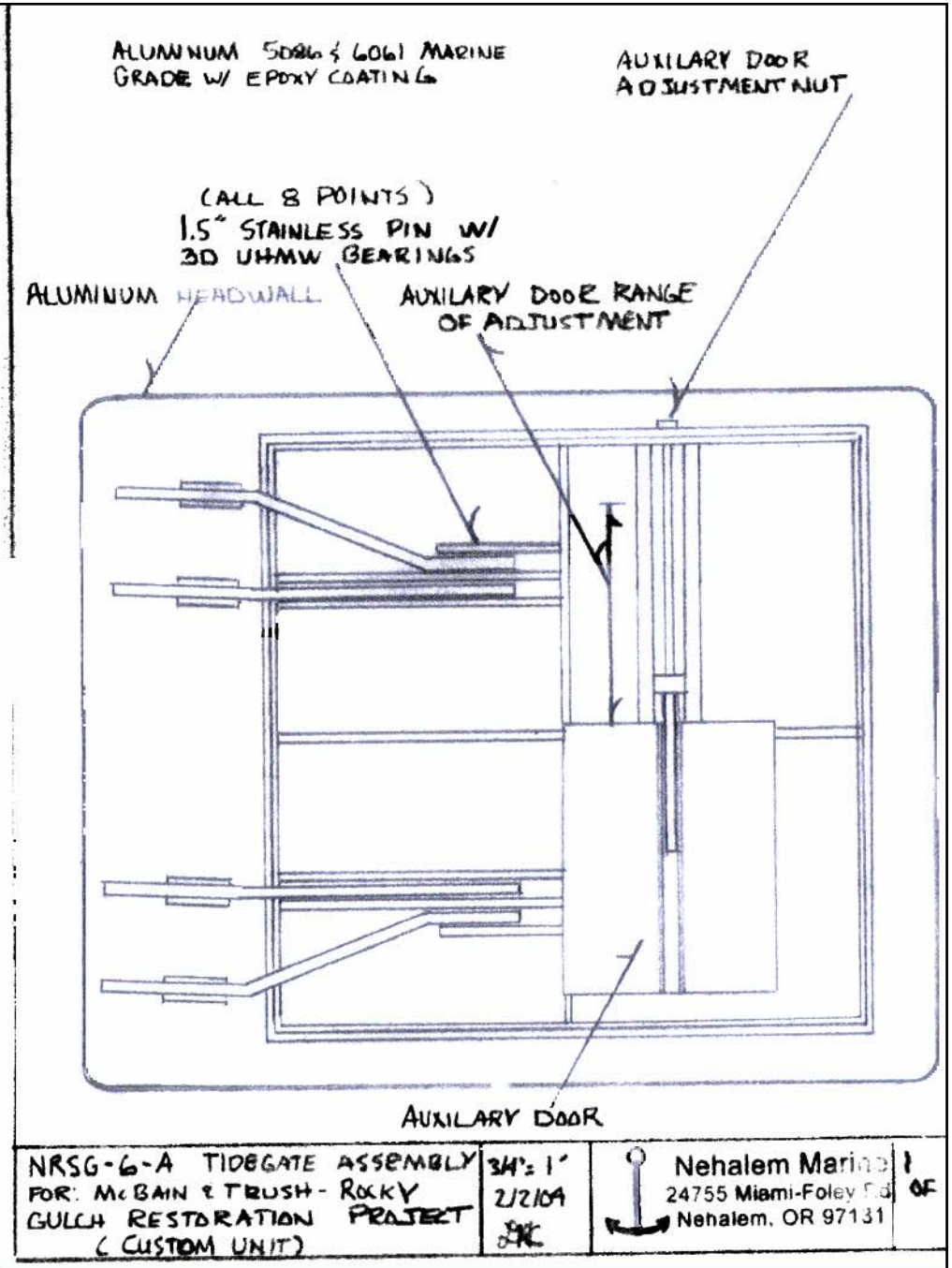
The floats would rotate the block to hold the door partially open during a period of rising tide to allow for longer fish passage time.




Early production side-hinge tidegate. Coos Watershed 2002
*Tool- Sidehinge Tidegate
*Tool- Array
Mitigators - fish passage gates
Top-hinged - juvenile salmon
Side-hinged - adult salmon
Coalbank Tide Gates
Coos Bay, Oregon

Side-hinge Tidegate w/ adjustable aperture door for fish passage(2004)





NRSG-6-A TIDEGATE ASSEMBLY FOR: McBAIN & TRUSH - ROCKY GULCH RESTORATION PROJECT (CUSTOM UNIT)

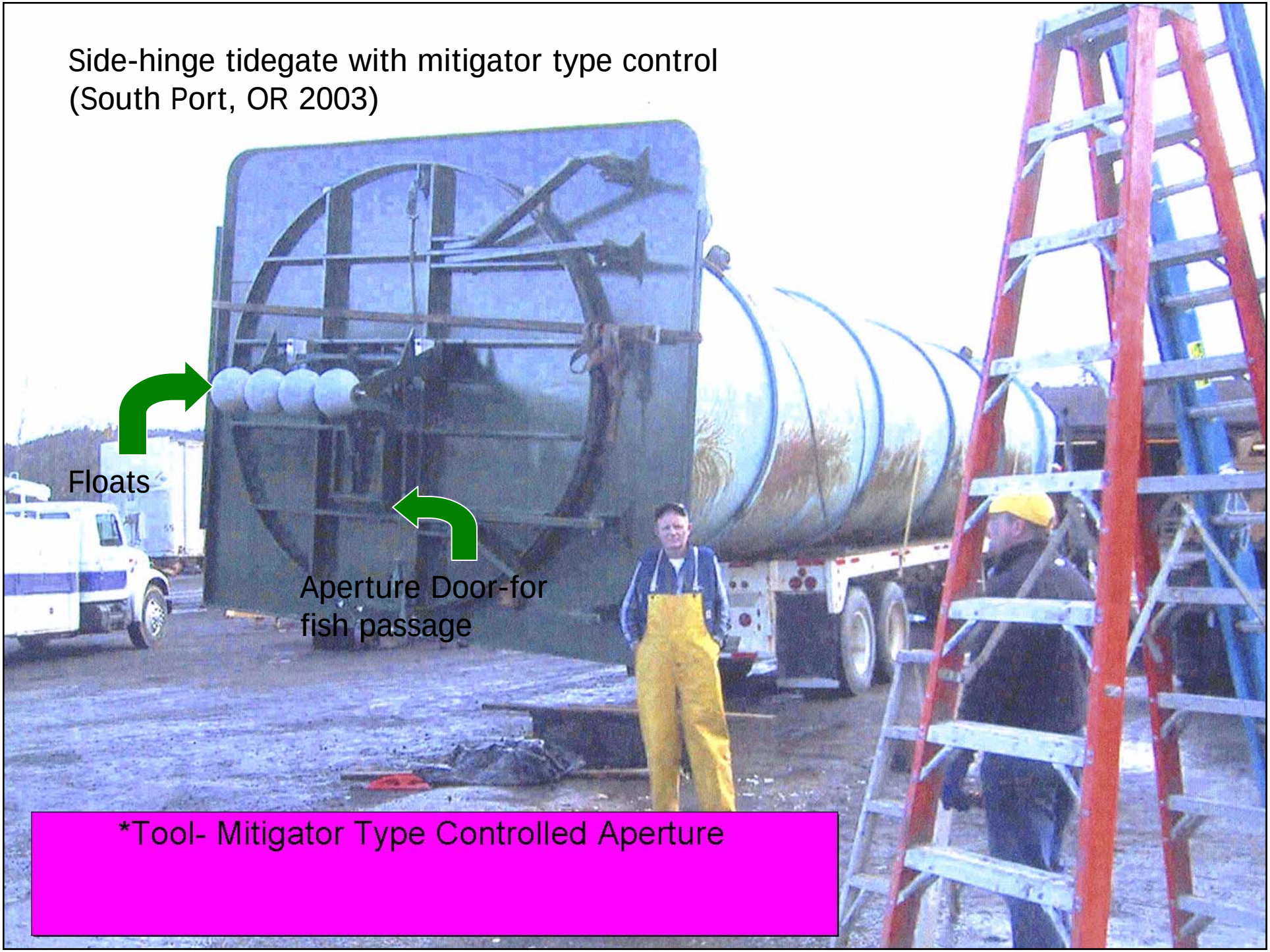
3/4" = 1"
2/2/04

Nehalem Marine
24755 Miami-Foley Rd
Nehalem, OR 97131

1 OF

*Tool- Adjustable Aperture Auxiliary Door

Side-hinge tidegate with mitigator type control
(South Port, OR 2003)



*Tool- Mitigator Type Controlled Aperture

Curtain type Top-hinge tidegate (Humboldt Bay NWR 2007).

The gate slides up and down w/ adjustment handle which allows it to have a opening all the time (The opening size is dictated by how far the gate is slid up or down, a set position until adjusted again.)

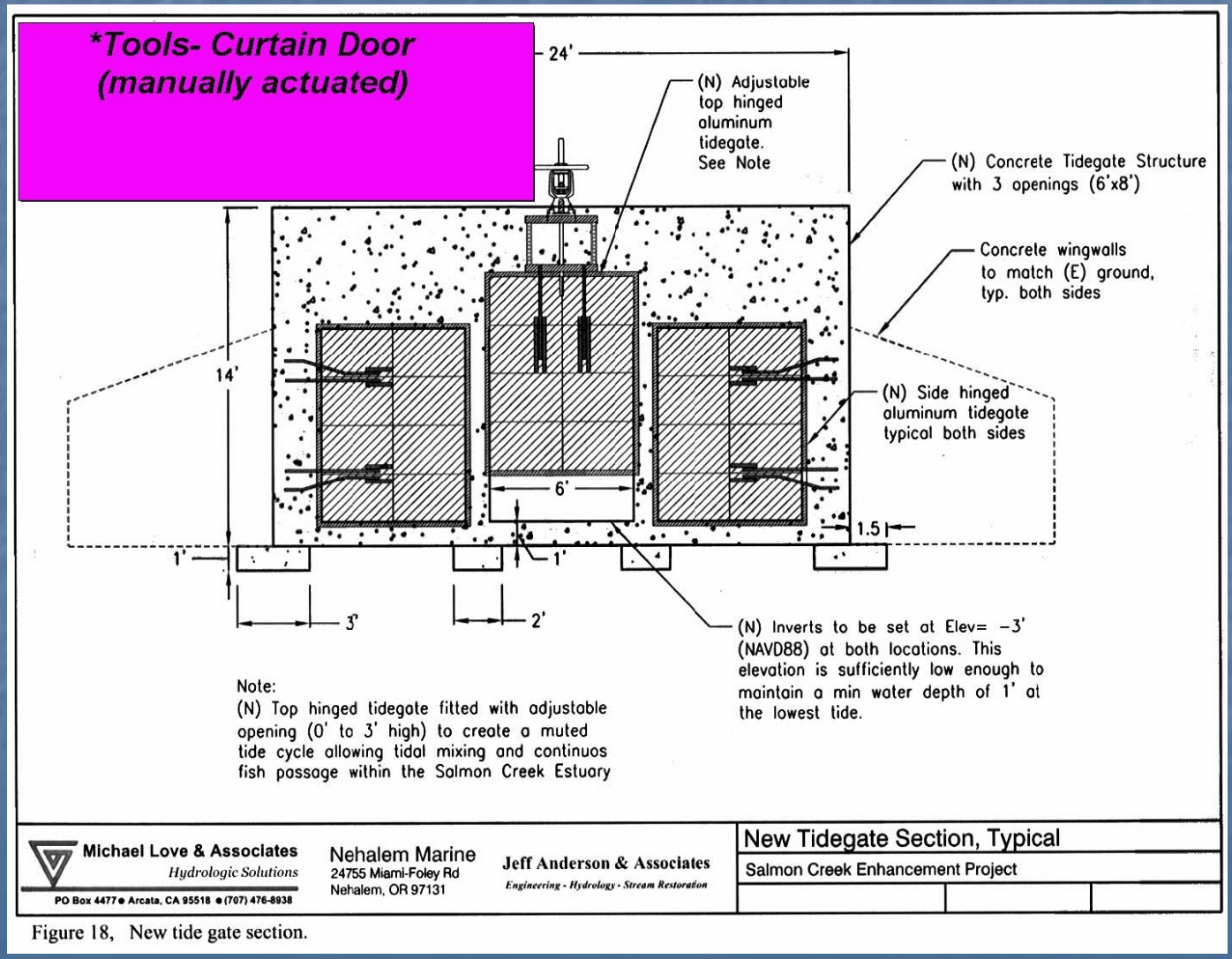
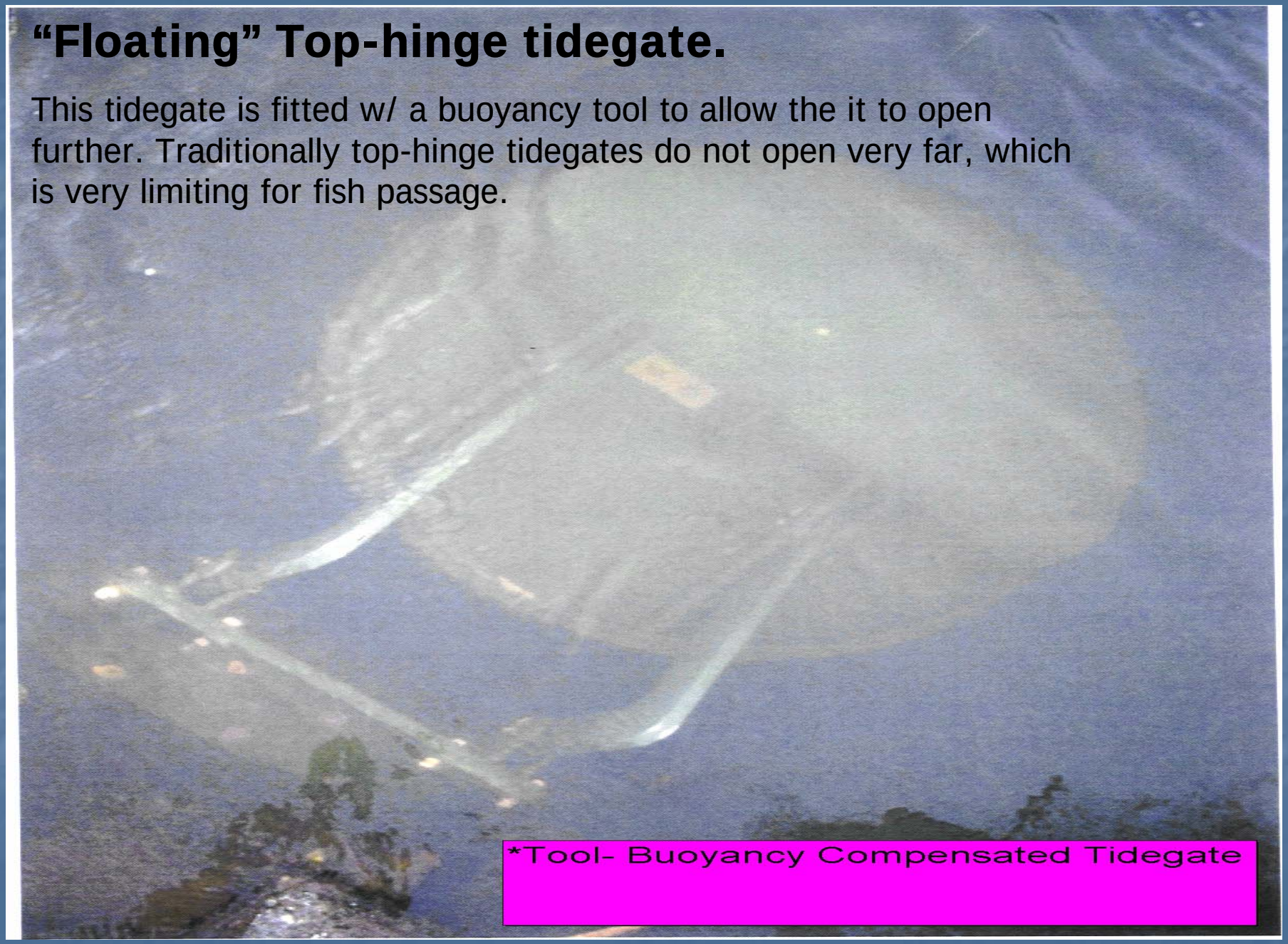


Figure 18, New tide gate section.

“Floating” Top-hinge tidegate.

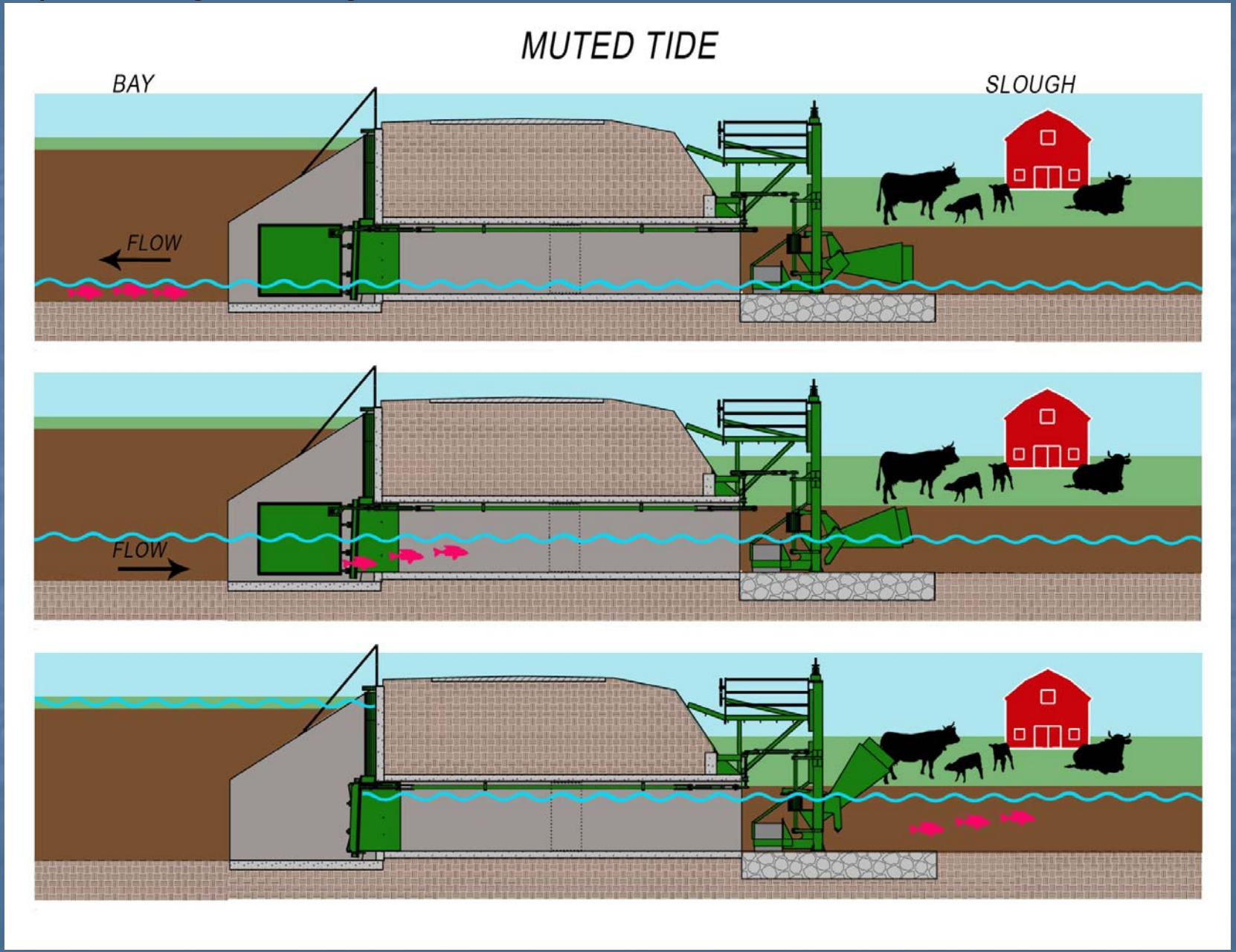
This tidegate is fitted w/ a buoyancy tool to allow the it to open further. Traditionally top-hinge tidegates do not open very far, which is very limiting for fish passage.



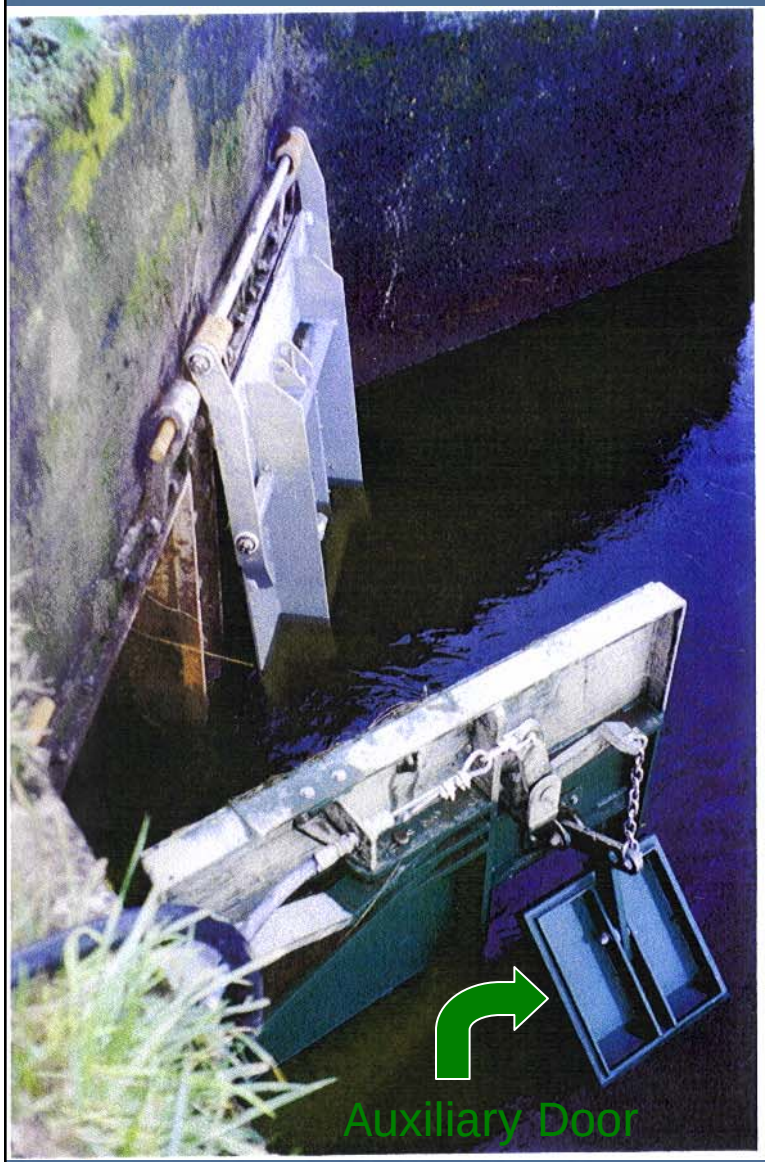
MTR

Muted Tidal Regulator

An illustration of a typical muted tidal cycle showing how the tidegate remains open during incoming tide until the interior inundation level is reached.



An early MTR driven auxiliary door



Mid Ebb Tide

***Tool- Muted Tidal Regulator**

MTR Controlled Auxiliary Door

Location: USFW Humboldt Bay National Wildlife Refuge

Tidal Management Tools

- Lightweight, double-hinged T/G
- Buoyancy compensated T/G
- Side-hinged T/G
- Manually adjusted curtain type T/G
- Adjustable apertures
- Mitigator type controlled aperture
- Arrays
- Mitigator
- **Muted Tidal Regulators (MTR)**

OREGON FISH PASSAGE LAW

ODFW Administers State Fish Passage Rules & Regulations
= Signed into Law 2001, *ORS 509.585*

This law requires all *new & replaced* structures (culverts, bridges water diversions, dams, tide gates, fishways, etc.) to meet fish passage criteria

All projects shall have ODFW Fish Passage approval (fish passage permit) prior to construction.

Contact your local ODFW District Office for information & assistance

Fish Passage Approval Forms @ ODFW website
http://www.dfw.state.or.us/fish/passage/

Greg Apke, 503-947-6228 ***greg.d.apke@state.or.us***

OREGON
Fish & Wildlife

OREGON TIDEGATE FISH PASSAGE CRITERIA

(SIMILAR CRITERIA CURRENTLY BEING ADOPTED BY NOAA/NMFS)

- ALL TIDEGATES NO LESS THAN 4' WIDE
- VELOCITIES MUST BE AT OR UNDER 2FPS 50% OF TIME
- LEGAL FISH PASSAGE MUST BE MAINTAINED 50% OF TIME
- FULL FISH PASSAGE REVIEW WHEN TRIGGER OCCURS

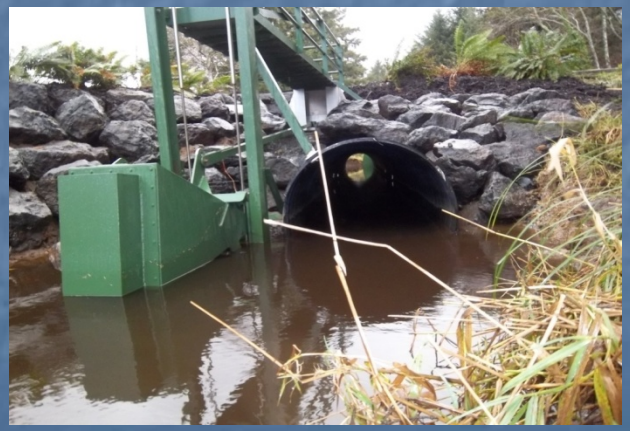
OREGON STATE STATUTE

- Owners & Operators of Culverts Must Address Fish Passage when "Trigger Events" Occur.
- "Trigger Events" include
  - Major Replacement
  - Installation
  - Activities that Extend the Life of Culverts (new floors, aprons, wing walls, slip lining, etc…..
  - Abandonment of Artificial Obstruction

Little Pompey Before Restoration

Little Pompey After Restoration

Muted Tidal Regulator (MTR) System

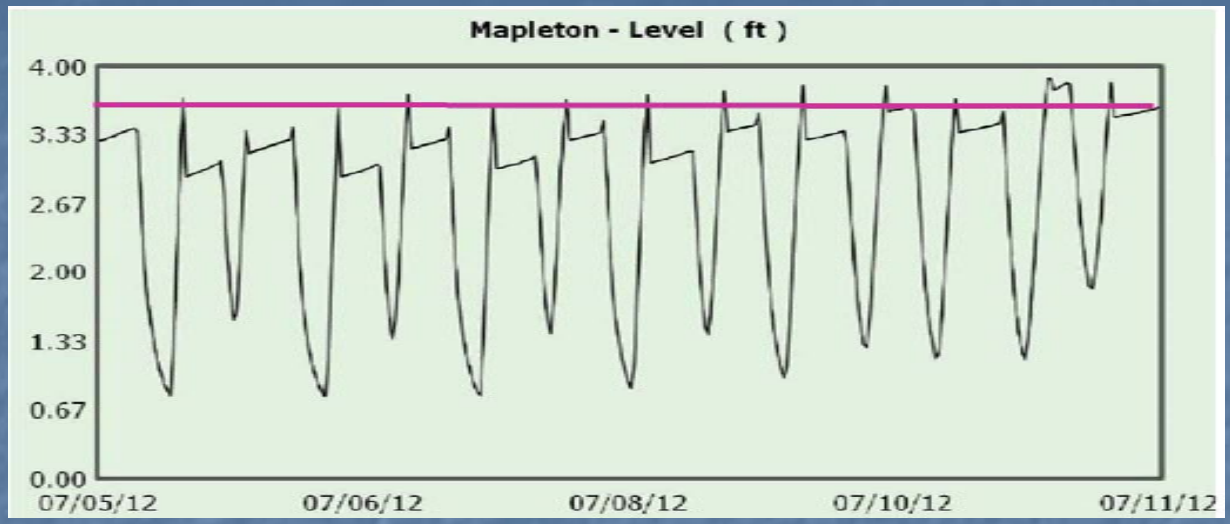


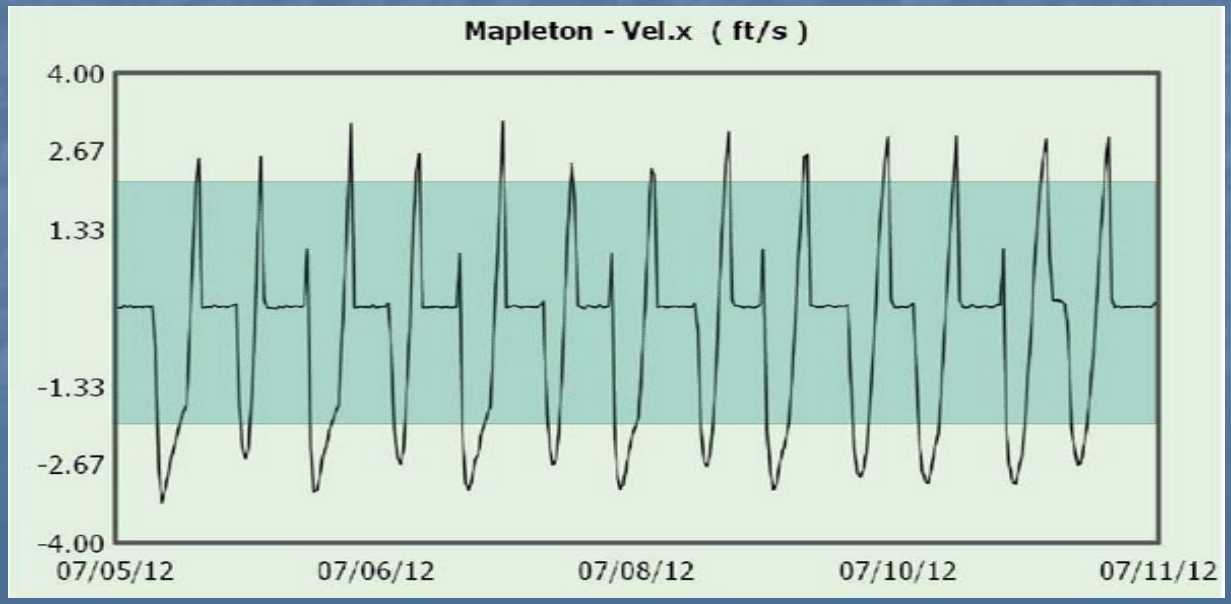
Pheylane MTR

Pheylane

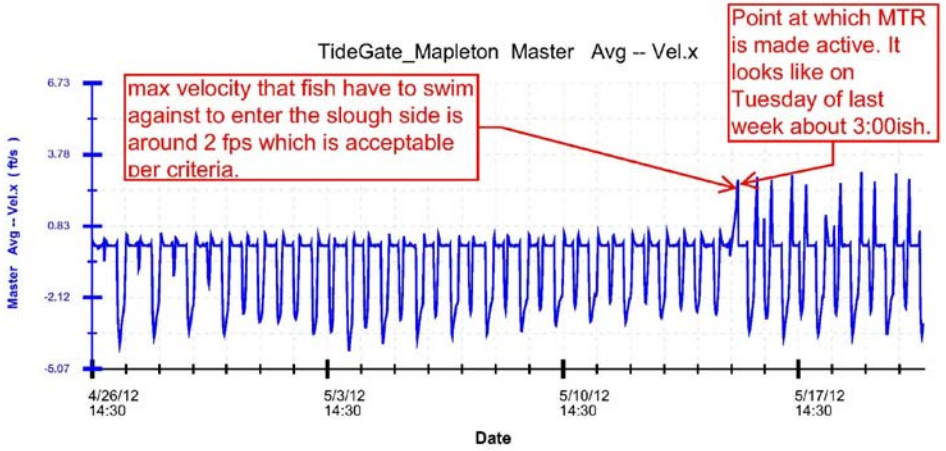
Pheylane Monitoring

MTR regulating interior inundation level (Peaks indicate water level where gate is closing) Inundation level set for 3.50'.





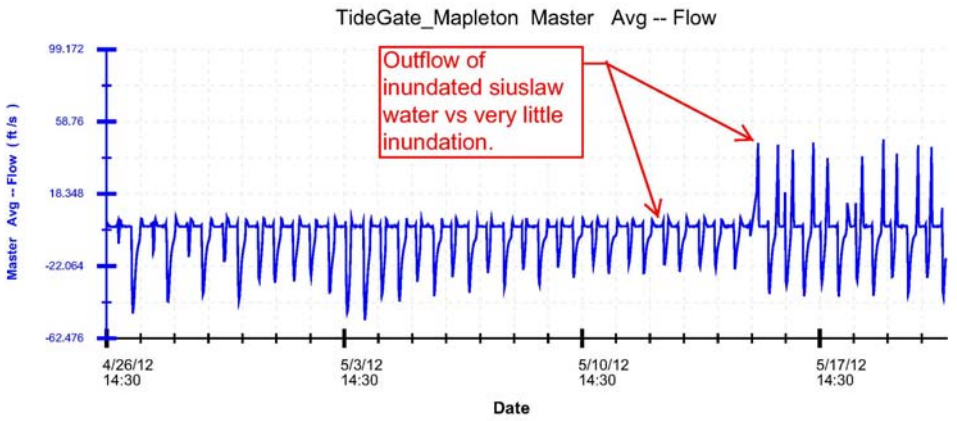
Graph showing that the system is meeting ODFW velocity requirement of 2fps.



These graphs are a great data collection of a side-hinge gate operating w/out a regulator then the same gate operating with a regulator. As the data is a direct comparison (same gate, same waterway) it is very telling.

We obtained this data as the MTR for this gate was unhooked for modifications (beginning of graphs) then re-activated (end of graphs)

(Pheylane tidegate. Slides from Ryan McCormick ODFW)



Fish Passage @ Pheylane

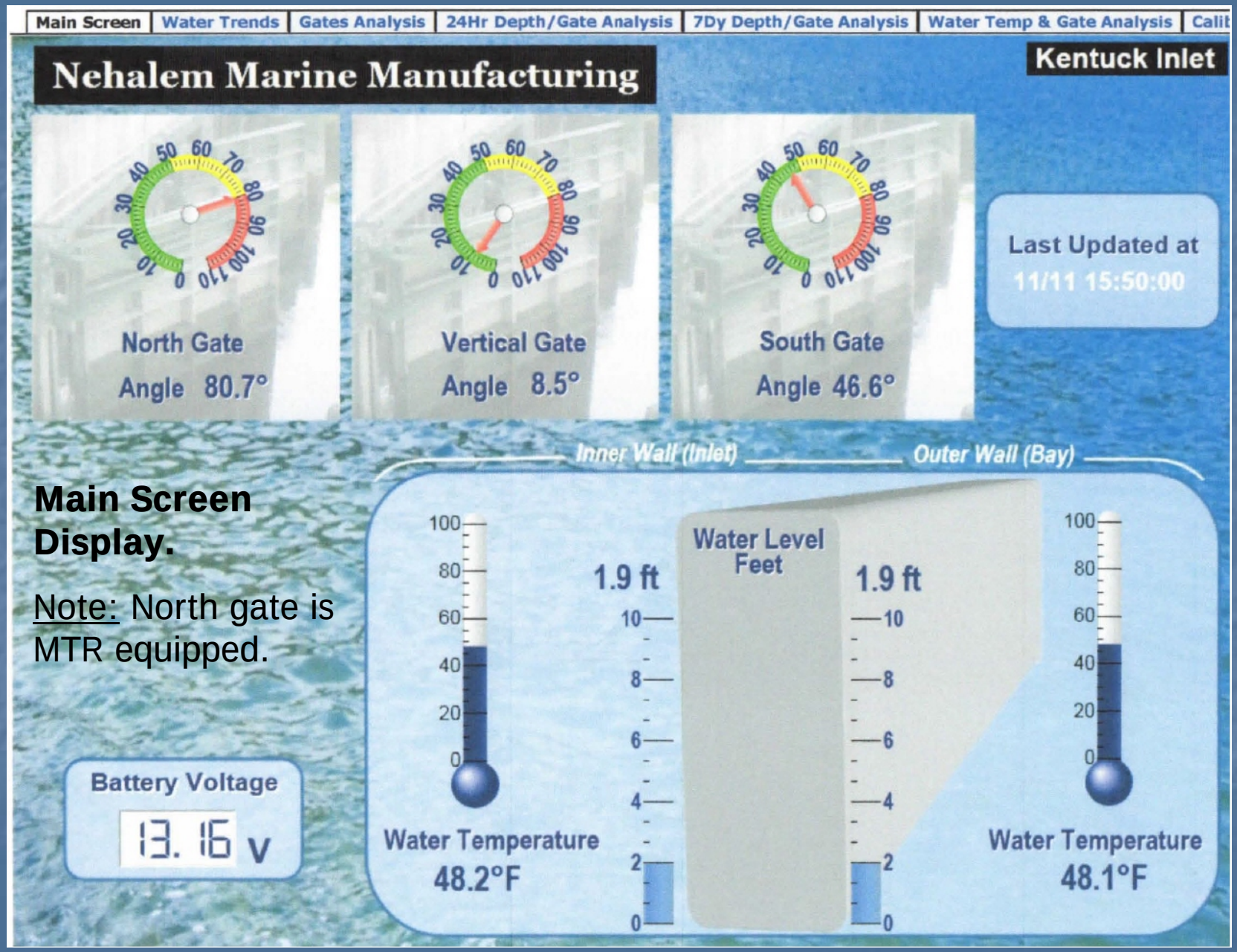
Coho entering OCTH through MTR side-hinge tidegate. They are presumed to be from upper Siuslaw Watershed and seeking OCTH.

Kentuck Tidegates

Early MTR system. Kentuck Slough, Coos Bay for Coos County Roadway Dept. (site of electronic monitoring station installed early 2012)

Top Hinge Side Hinge Array with MTR

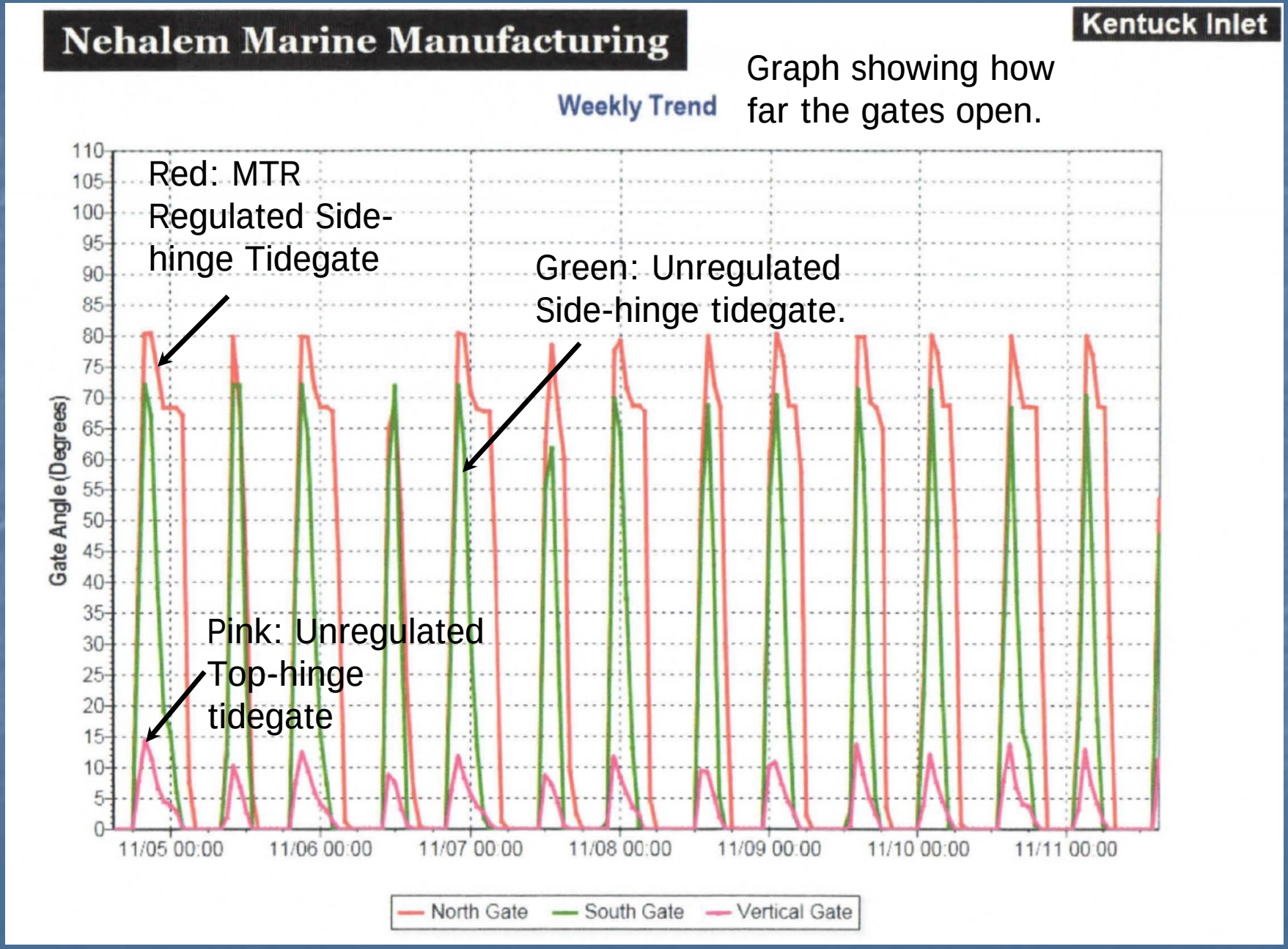
Kentuck Tidegates Monitoring Data



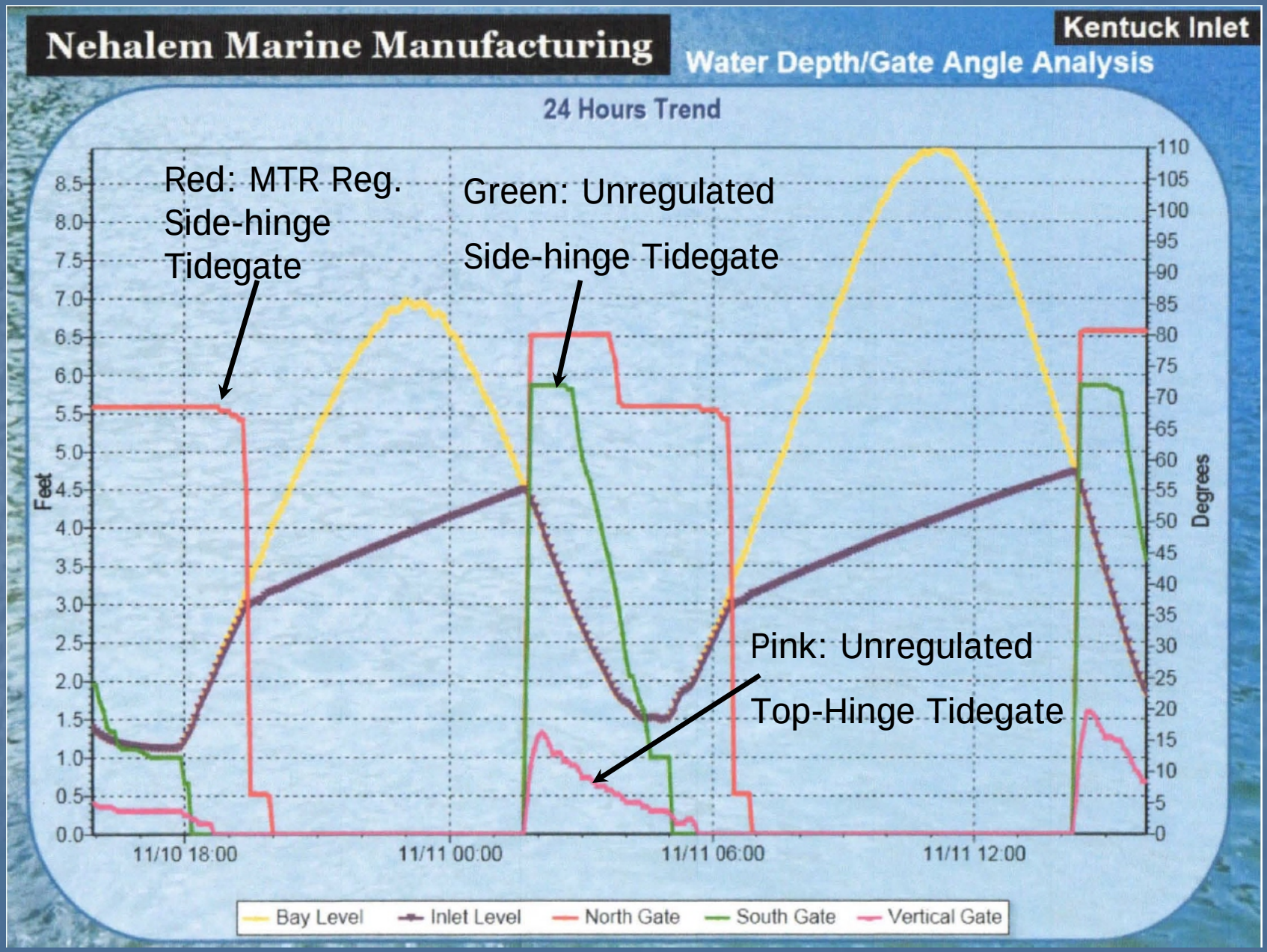
Main Screen Display.

Note: North gate is MTR equipped.

Kentuck Tidegates Monitoring Data



Kentuck Tidegates Monitoring Data



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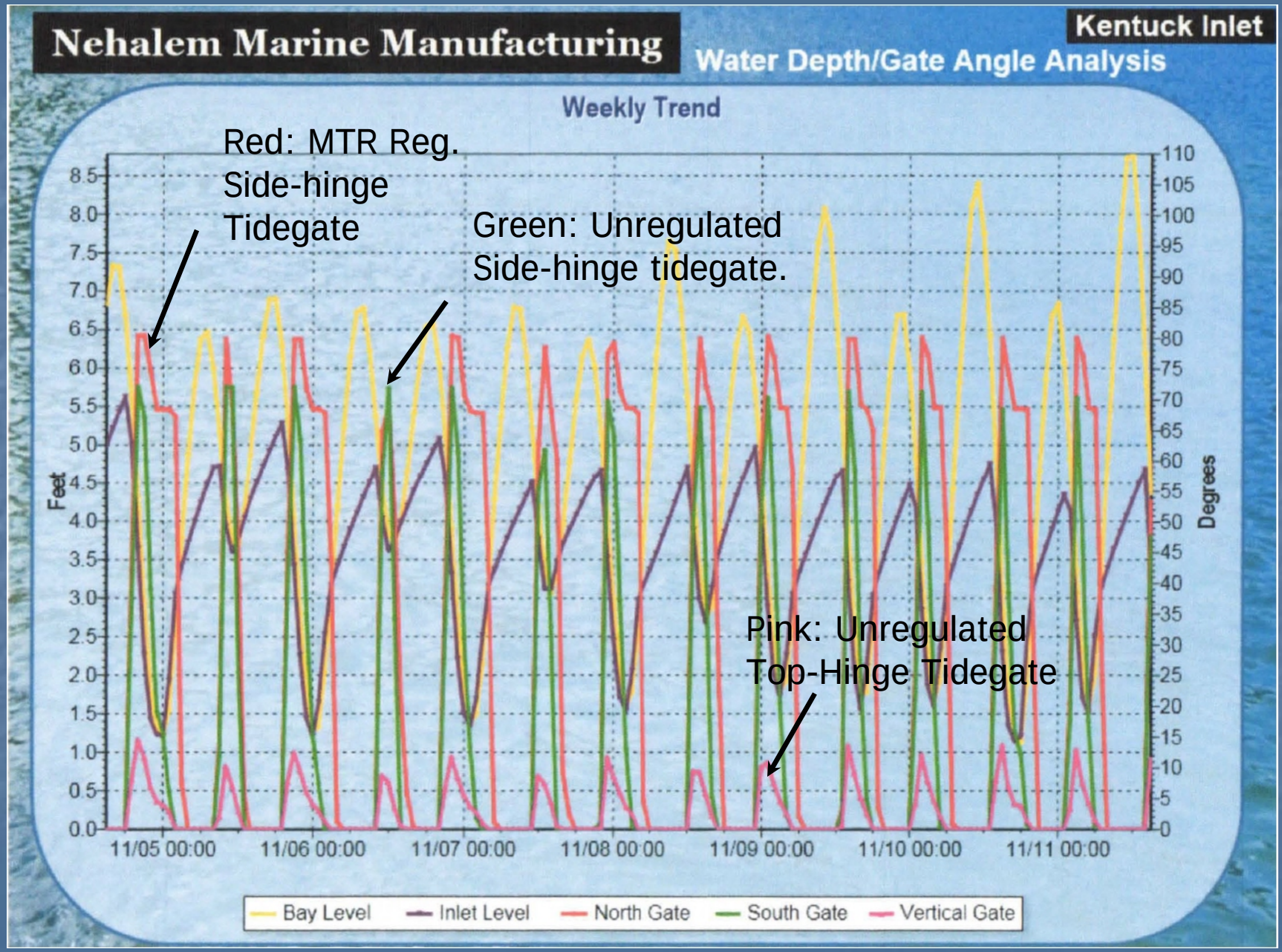

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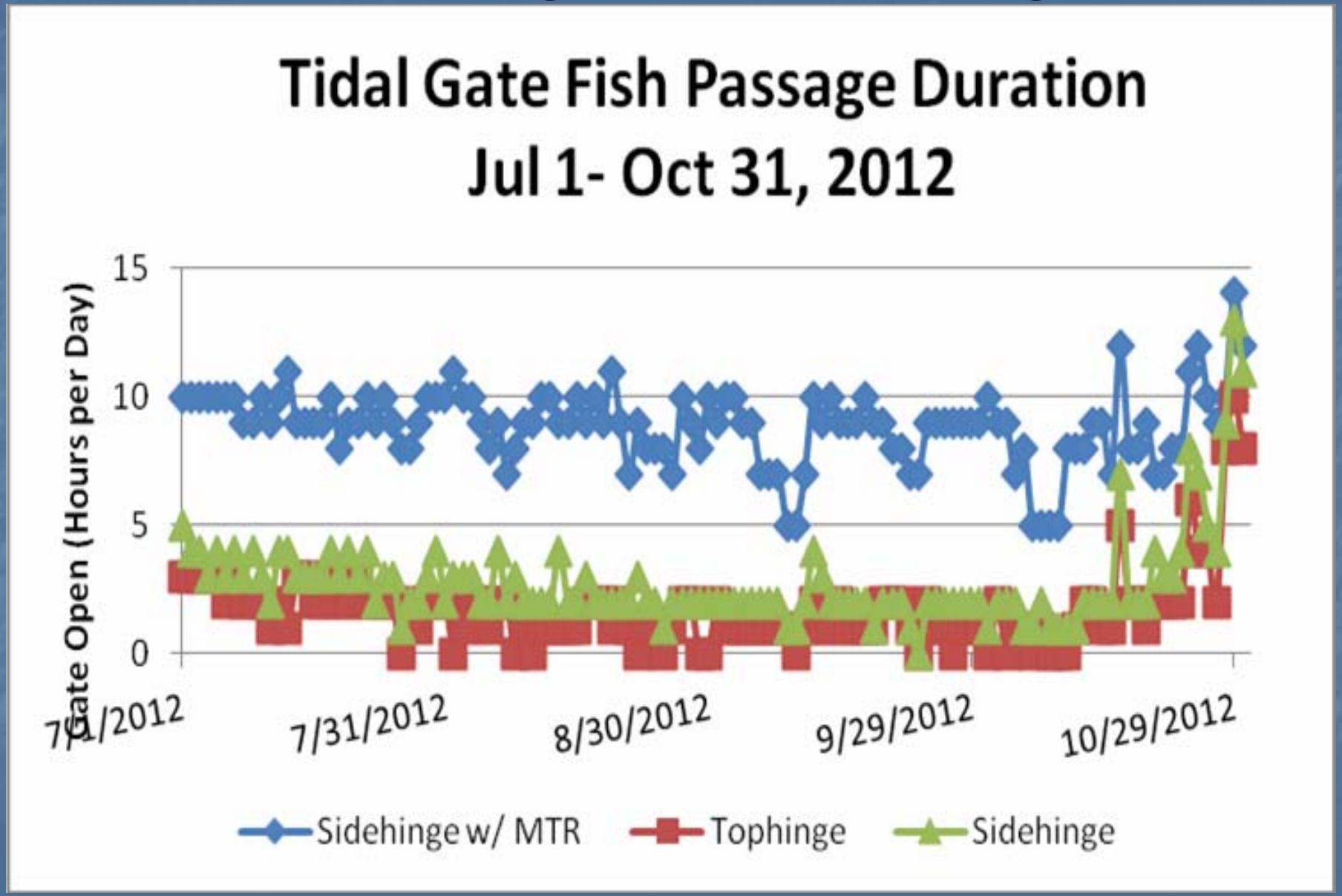
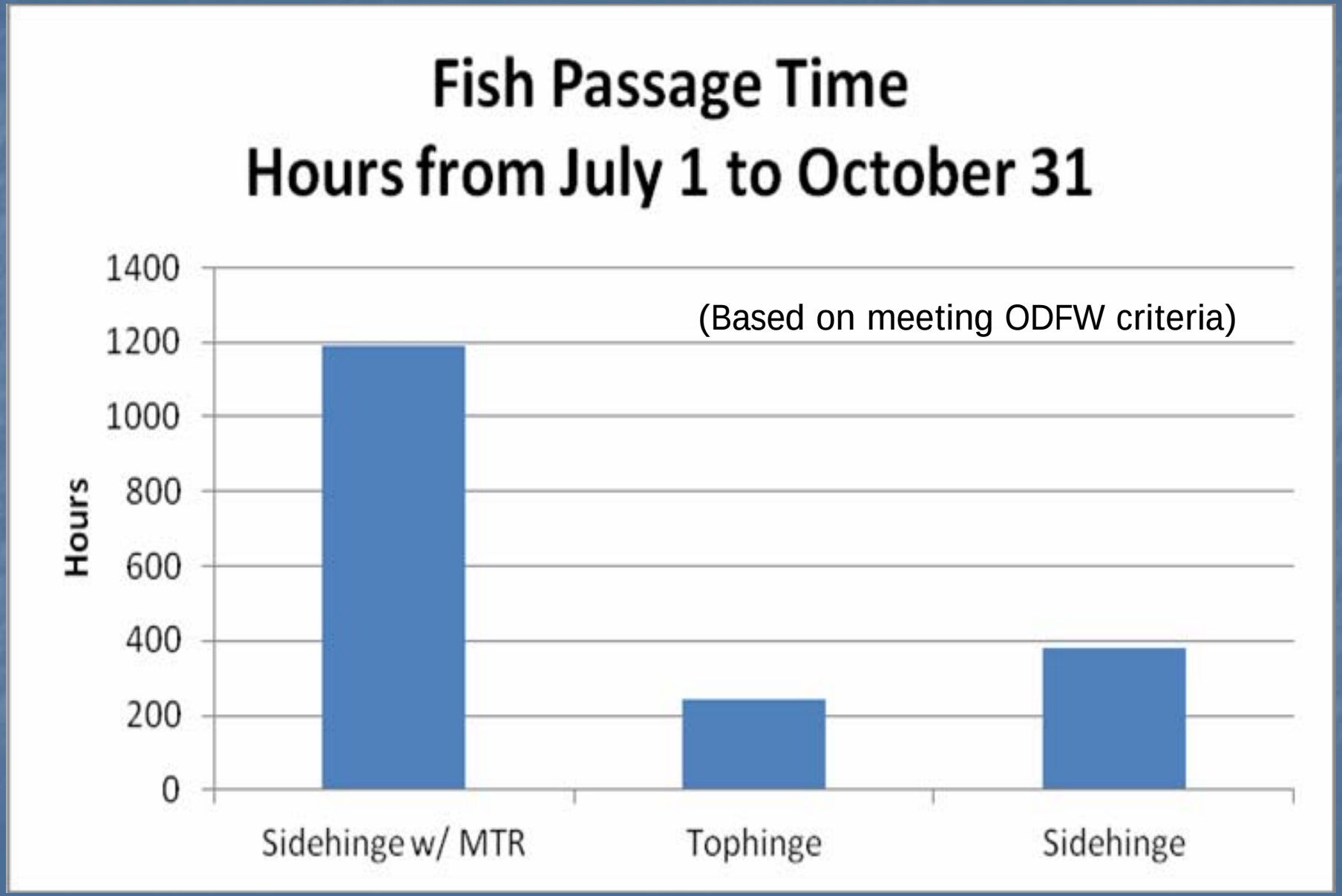
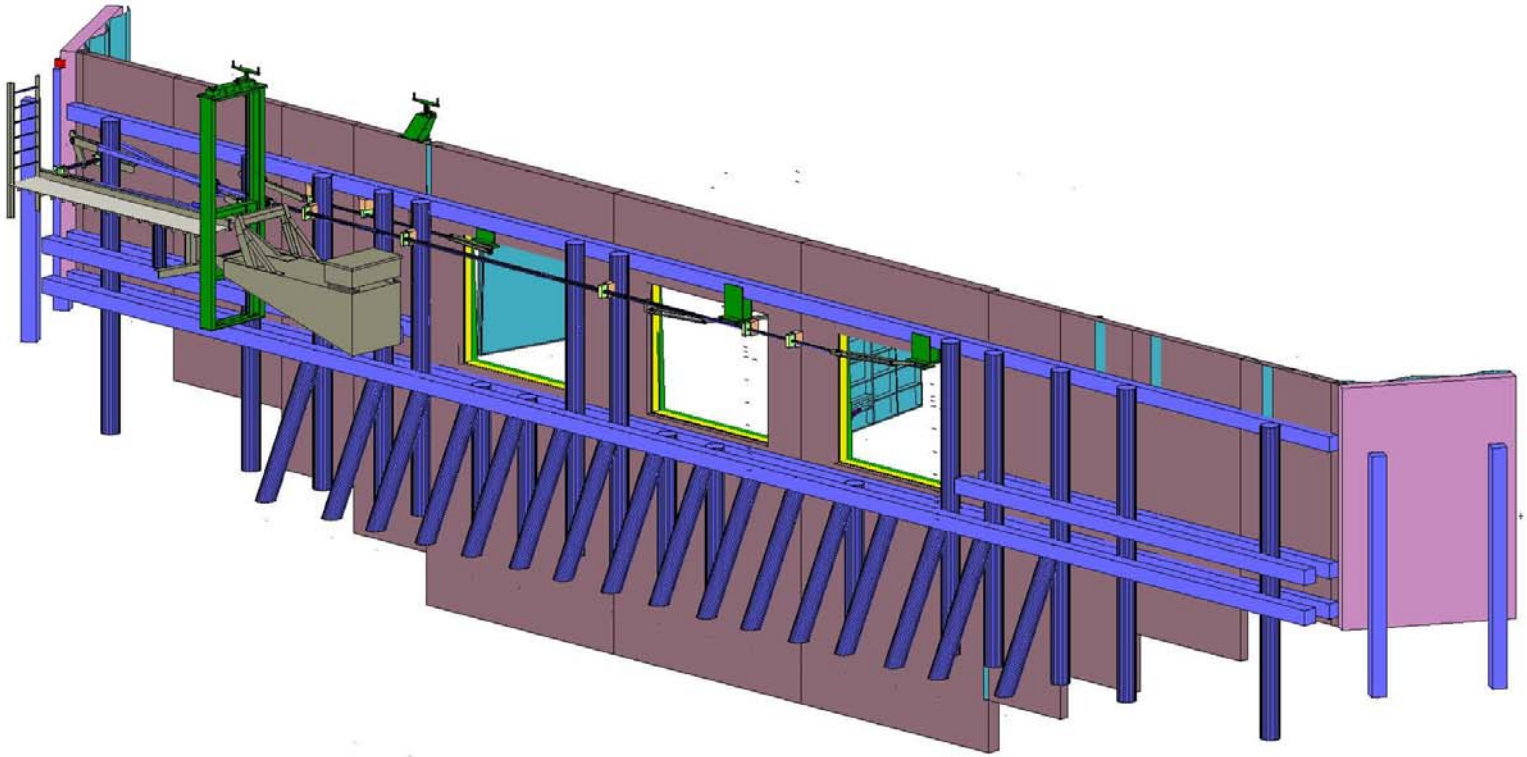


Kentuck Tidegates Monitoring Data



Fisher Slough Restoration



Fisher Slough
Compatible Restoration

- **This photo is intended to show restored/wet habitat adjacent to a growing commercial potato crop. This photo was taken as the water receded after three weeks of very high water in June and early July this year. The river had been near flood stage so the floodgates were closed much of the time and tributaries were also high. The dike and drainage measures we installed seemed to work great; the field was dry and the crop did fine. This was not the case in other fields in the delta.**

North Slough tidegates under construction at the shop.


Existing North Slough tidegates to be replaced. (01-23-13am)

North Slough tidegate replacement project 01/23/13 mid-day.


North Slough tidegate
replacement project
01/23/13 early
afternoon.

North Slough MTR
installation on interior.


North Slough 01/23/13
afternoon, operating
normally.

Agricultural/Fish Passage

A typical 4’ side-hinge tidegate “ready to install” unit.


Typical 4’ side-hinge
tidegate unit
installed.

Fornsby Slough

Tidegate & MTR system at slack low-Tide.

Small note: Failed culverts and SRT have been replaced with sidehinge gate and MTR, mark on bank at target inundation level

Target inundation level.

Tide flooding in.

Nearing inundation level.

Tidegate closing.

Tidegate MTR system at full Inundation level.

Note: The high-value agricultural land in the back ground.

Tidegate closed.

Helpful Web Sites

- www.measuretek.com/resultxnehalem/home Username: nehalemmarinemfg Password: nmm101
- www.qdata.com Username: pheylaneguest_u Password: pheylane (Temporarily Offline)
- www.nehalemmarine.com Nehalem Marine Manufacturing's Home site.
- Tidegates & Salmon: Effects on Movement and Migration http://www.cooswatershed.org/Publications/Art%20Bass%20Power%20Point.pdf