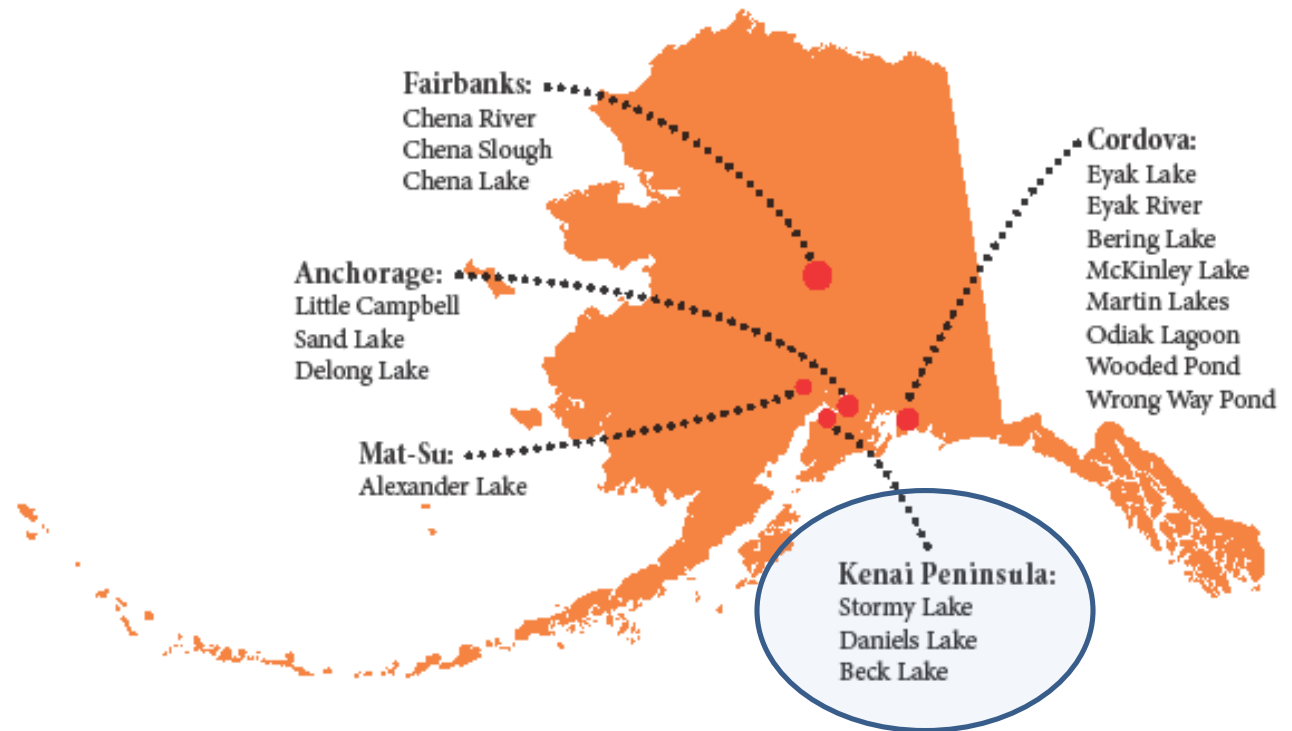


Elodea on the Kenai Peninsula and what we're doing about it

Known Locations of Elodea in Alaska



John Morton
Kenai National Wildlife Refuge







Community Elodea Information Meeting

Nikiski Community Recreation Center
Mile 23.4 Kenai Spur Highway

Tuesday February 19th, 2013
6 - 8:30PM

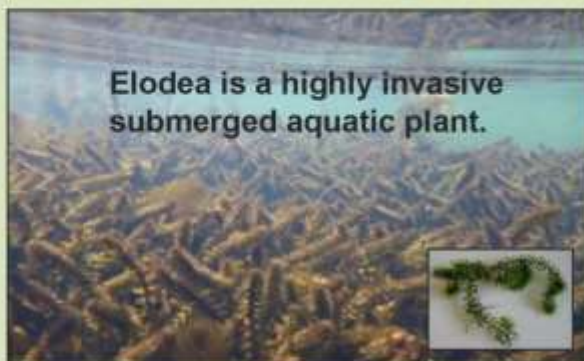


Please join us for a community meeting to discuss what to do about the discovery of Elodea in Stormy & Daniels Lakes.

Dr. Lars Anderson (USDA Agricultural Research Service and University of California-Davis), an aquatic invasive plant expert, will be at the meeting to provide information about Elodea, discuss options for management, and share his experiences in coping with aquatic infestations.

Elodea is not native to the Kenai Peninsula, and can cause serious, irreversible harm to fish and aquatic habitats if allowed to spread unchecked.

Elodea presence has recently been confirmed in Stormy and Daniels Lake on the Kenai Peninsula, and in some slow-moving waters in Anchorage, Fairbanks, and Cordova.



Elodea is a highly invasive submerged aquatic plant.



Meeting Open to the Public
For more information, please contact Janice Chumley at UAF-Cooperative Extensive Service, 907-262-5824



Why we don't want Elodea

Nuisance:
impedes boat and float plane launching, navigation, and fishing

Ecological:
degrades salmon spawning habitat

Safety: fouls float plane rudders and boat propellers

Economic:
reduces property values by fouling launch sites and shore habitats



INTEGRATED PEST MANAGEMENT PLAN FOR ERADICATING ELODEA FROM THE KENAI PENINSULA

April 2014

Prepared by
Elodea Subcommittee of the Kenai Peninsula Cooperative Weed Management Area

John M. Morton (USFWS Kenai National Wildlife Refuge, Soldotna)
Brienne N. Blackburn (AK Department of Natural Resources, Palmer)
Elizabeth Bella (USFWS Kenai National Wildlife Refuge, Soldotna)
Matt Steffy (Homer Soil & Water Conservation District, Homer)
Cheryl Anderson (USFWS Kenai Fish & Wildlife Field Office, Soldotna)
Rob Massengill (Alaska Department of Fish and Game, Soldotna)
Jack Blackwell (AK State Parks, Soldotna)
Lisa Ka'aihue (Cook Inlet Aquaculture Association, Kenai)
Rebecca Zulueta (Kenai Watershed Forum, Soldotna)
Janice Chumley (UAF Cooperative Extension Service, Soldotna)
Michele Aranquiz (Kenai Peninsula Borough Mayor's Office, Soldotna)
Cecil Rich (USFWS Regional Office, Anchorage)

In consultation with:

Lars Anderson (Waterweed Solutions, Davis)
Donald H. Les (University of Connecticut, Storrs)
Scott Schuler (SePRO Corporation, Carmel, IN)
Andrew Skibo (SePRO Corporation, Fort Collins, CO)



**Cooperative Weed
Management Area**

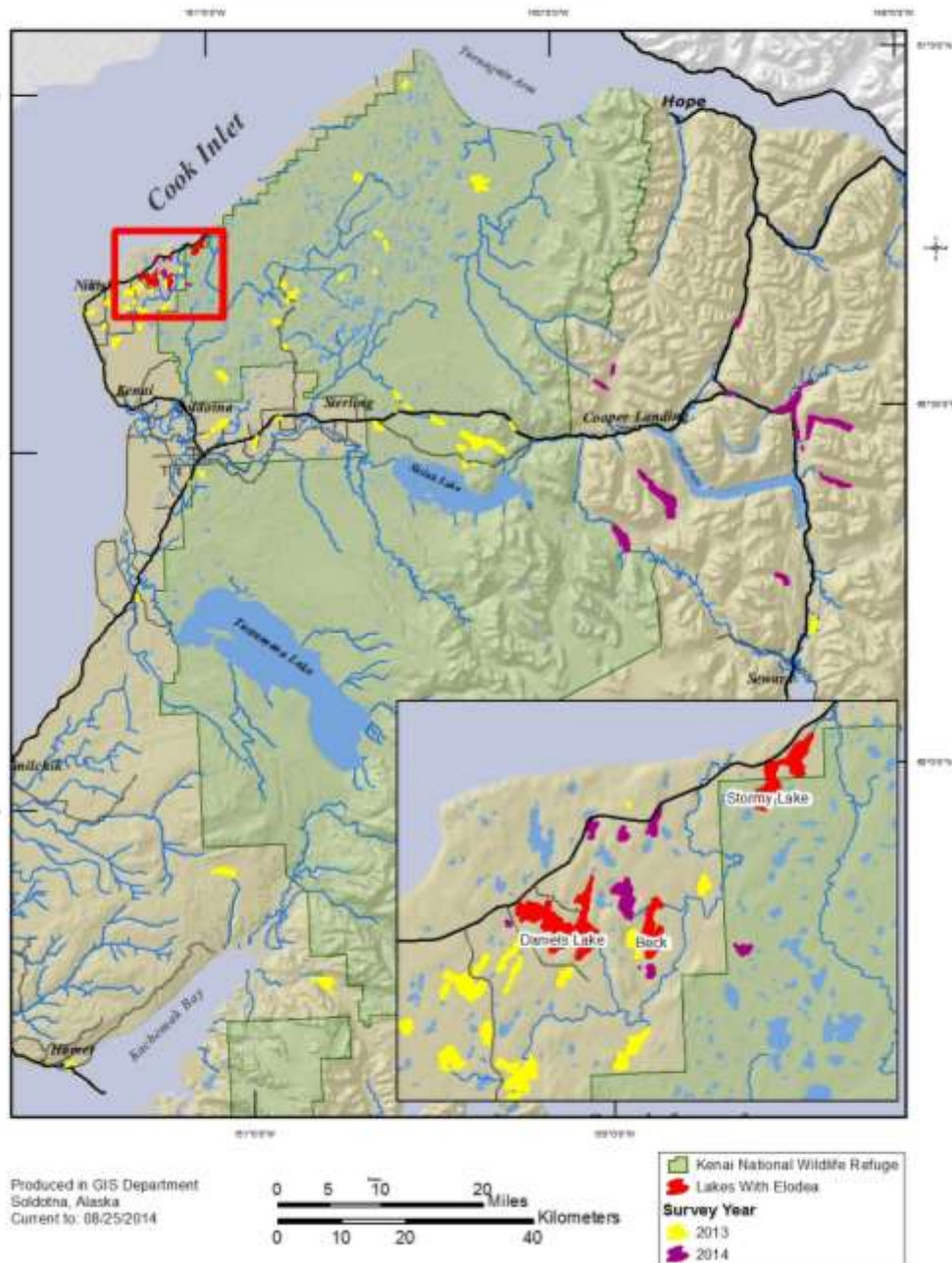


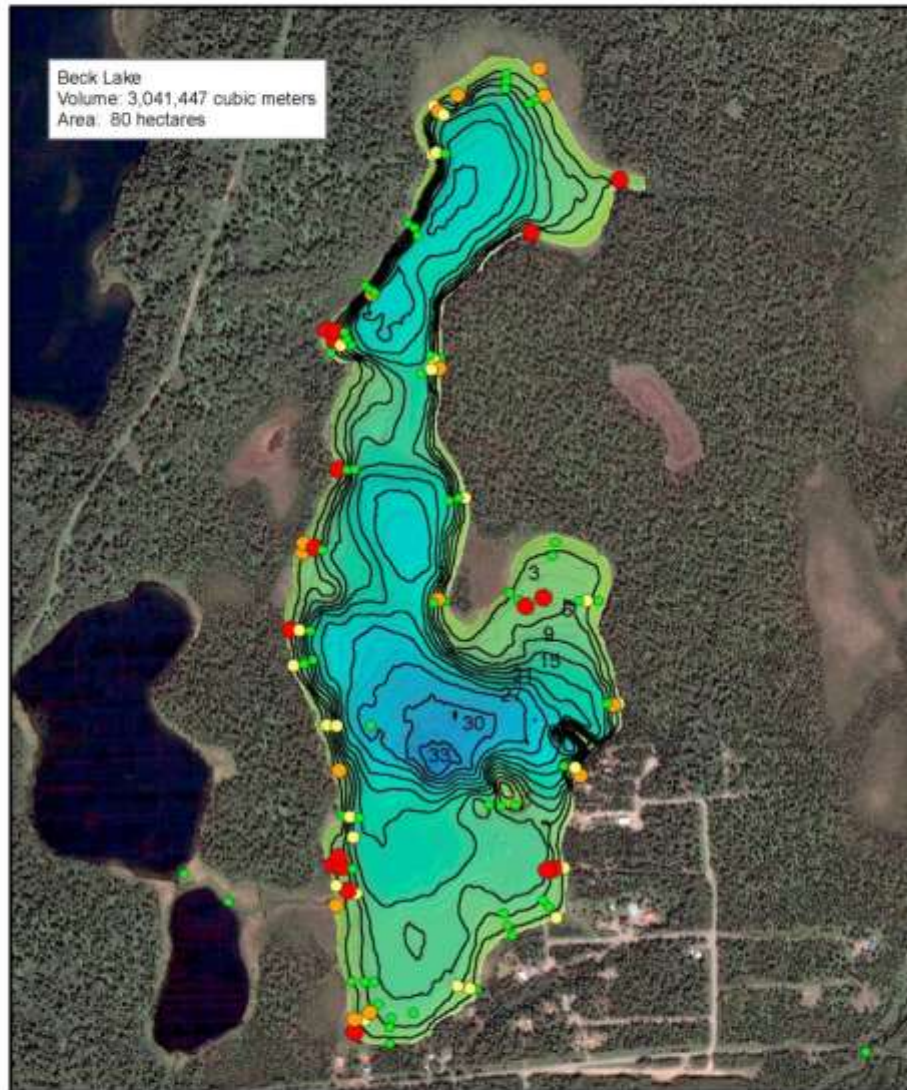
Kenai Watershed Forum





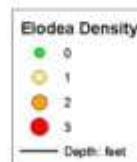
101 at-risk lakes surveyed in summers 2013 & 2014





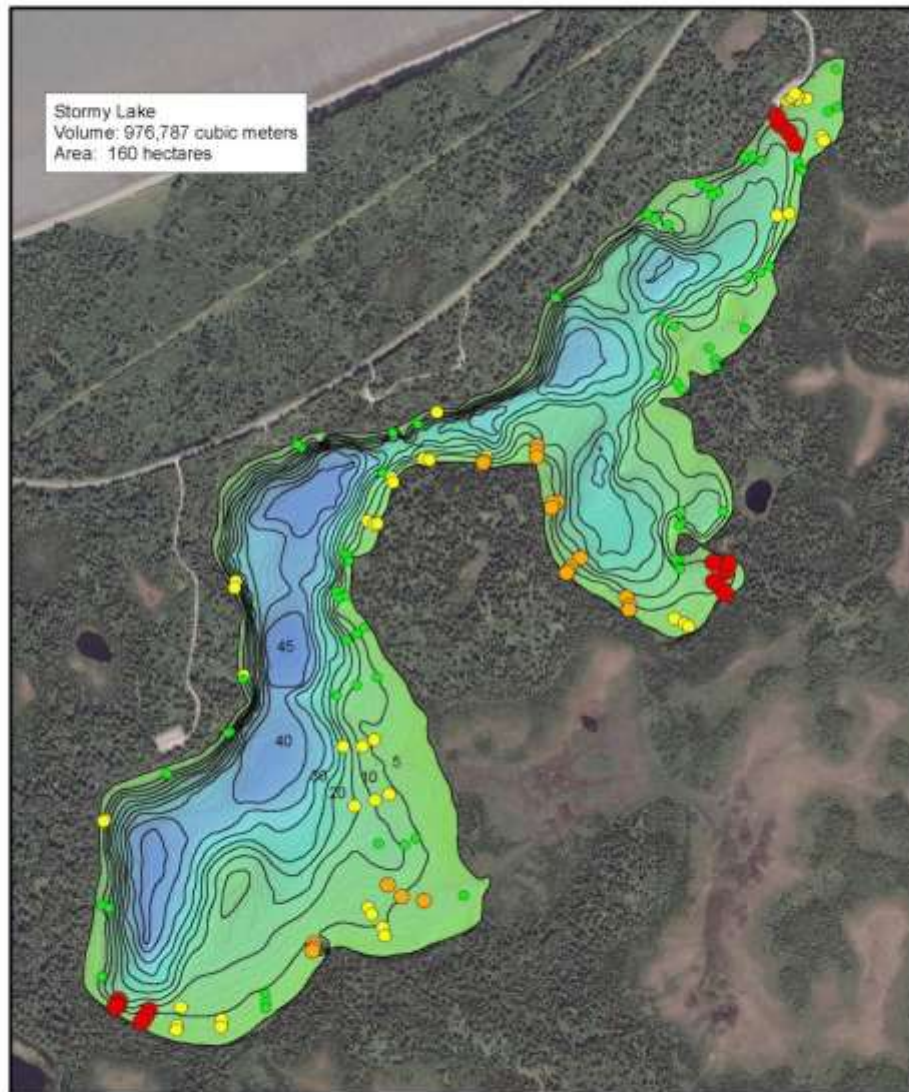
Produced in GIS Department
Soldotna, Alaska
Current to: November 20, 2013
File: map_BeckLakeElodea.pdf

0 0.05 0.1 0.2 0.3 0.4 Miles
0 0.05 0.1 0.2 0.3 0.4 Kilometers



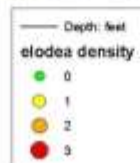
Beck Lake requires whole-lake treatment (200 acres)

- Some private landowners
- Floatplanes
- NO public access
- Outlet flows into Bishop Creek
- Rainbow trout



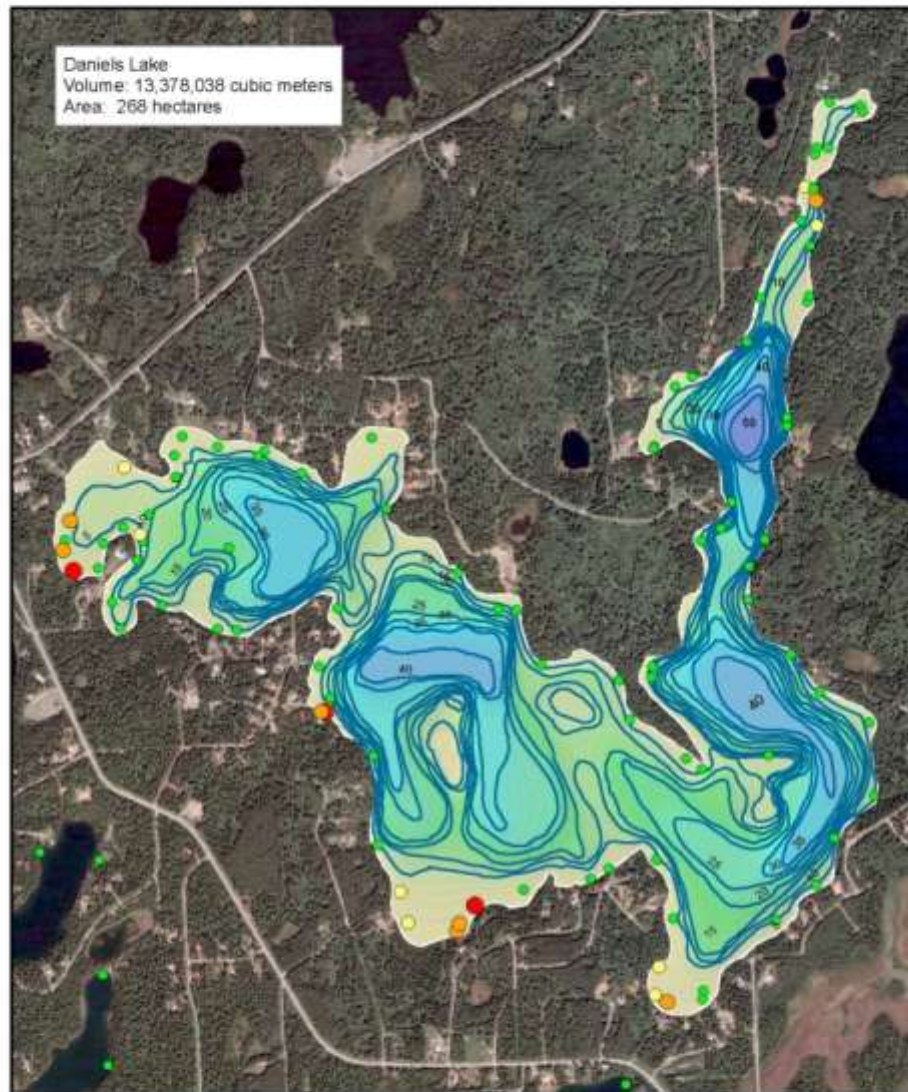
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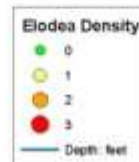
Stormy Lake requires whole-lake treatment (400 acres)

- State Parks/KENWR
- 1 public boat launch
- Outlet flows into Swanson River
- Arctic char



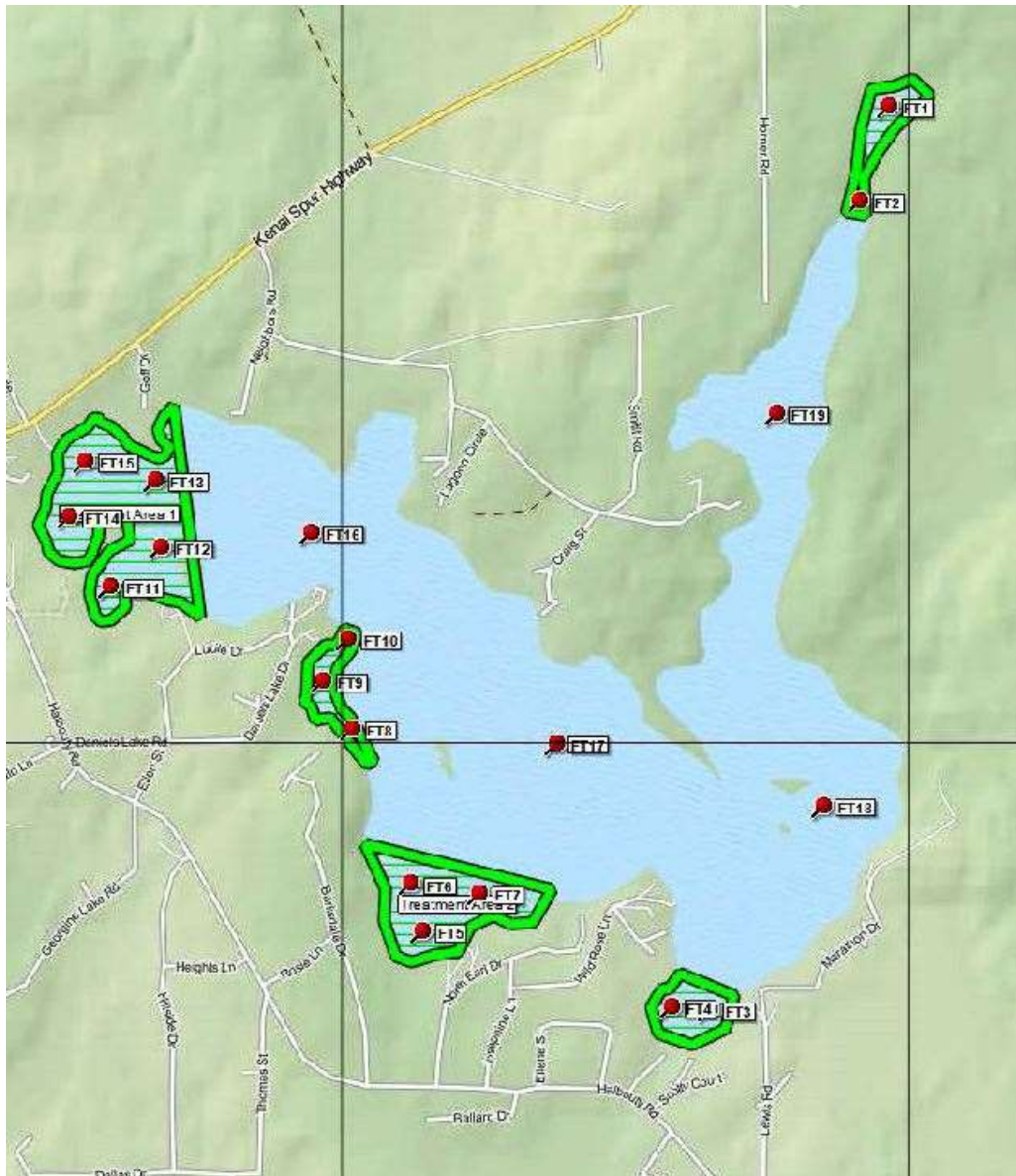
Produced in GIS Department:
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Current to: November 20, 2013
File: map_danielsLakeElodea.pdf

0 0.06 0.1 0.2 0.3 0.4 Miles
0 0.075 0.15 0.3 0.45 0.6 Kilometers



Daniels Lake requires partial-lake treatment (100 of 660 acres)

- All private landowners
- Floatplanes
- 1 community boat launch
- Outlet flows into Bishop Creek
- Sockeye salmon



5 treatment sites on Daniels Lake

Red dots = 19 FasTEST sites

Fluridone kills elodea systemically and selectively with few nontarget effects

- ✓ Absorbed through the roots and shoots (systemic)
- ✓ Inhibits the plant enzyme phytoene desaturase (carotenoids)
- ✓ Inhibits photosynthesis - plant slowly starves and dies at very low concentrations ($\lll 150$ ppb)
- ✓ But needs to be in water column for 45 – 90 days
- ✓ Applied as liquid or slow-release pellets
- ✓ Degrades by photolysis, adsorption, absorption
- ✓ **No** restrictions on swimming, drinking or fishing
- ✓ Minimal irrigation precautions



Diquat (\$9K) also applied in June 2014 to prevent Daniels Lake transitioning from 100-acre partial lake to 660-acre whole lake treatment

Daniels Lake (partial treatment) Reward® Diquat bromide		
Treatment Area	acres	gal
1	52.1	47
2	29.1	29
3	10.1	10
4	9.2	8
5	8.0	7
Σ	108.5	101



Four herbicide treatments over three years (2014-16) to eradicate elodea

	Beck	Stormy	Daniels	Cost
Acres	200	400	660 (100)	
Approach	WHOLE	WHOLE	PARTIAL	
June 2014	liquid/pellet fluridone	liquid/pellet fluridone	diquat pellet	\$360k
Sept 2014	pellet	pellet	pellet	
June 2015	pellet	pellet	pellet	\$144k
June 2016	pellet	pellet	pellet	\$116k
Cost	\$113K	\$320K	\$197K	\$620K

Funds received to date

Receiving Office	Funds Rec'd	Funding Source	Purpose
Kenai Fisheries Office (USFWS)	\$28K	KP Fish Habitat Partnership	Survey peninsula lakes
Kenai NWR (USFWS)	\$20K	USFWS R7 Invasive Species Management with Volunteers	Survey peninsula lakes
Kenai NWR (USFWS)	\$40K	Kenai Peninsula Borough	Support treatments
Kenai NWR (USFWS)	\$40K	National Fish and Wildlife Foundation	Support treatments
Kenai Fisheries Office (USFWS)	\$35K	USFWS R7 Aquatic Invasive Species Program	Nontarget effects study
Kenai NWR (USFWS)	\$120K	USFWS R7 Invasive Species Management with Volunteers	Support treatments
Kenai Peninsula Borough	\$400K	State capital funds appropriation	Support treatments
Kenai Watershed Forum	\$125K	KP Fish Habitat Partnership	Support treatments

Application equipment



Pellet blower for SonarONE



Pump for Sonar Genesis, Diquat

Nets at lake outlets









16' SPORTSMAN

AK8821AG

SOG

mph

5.0



MOB

ZOUT

ZIN

EXIT

ENTER

MENU

PAGE

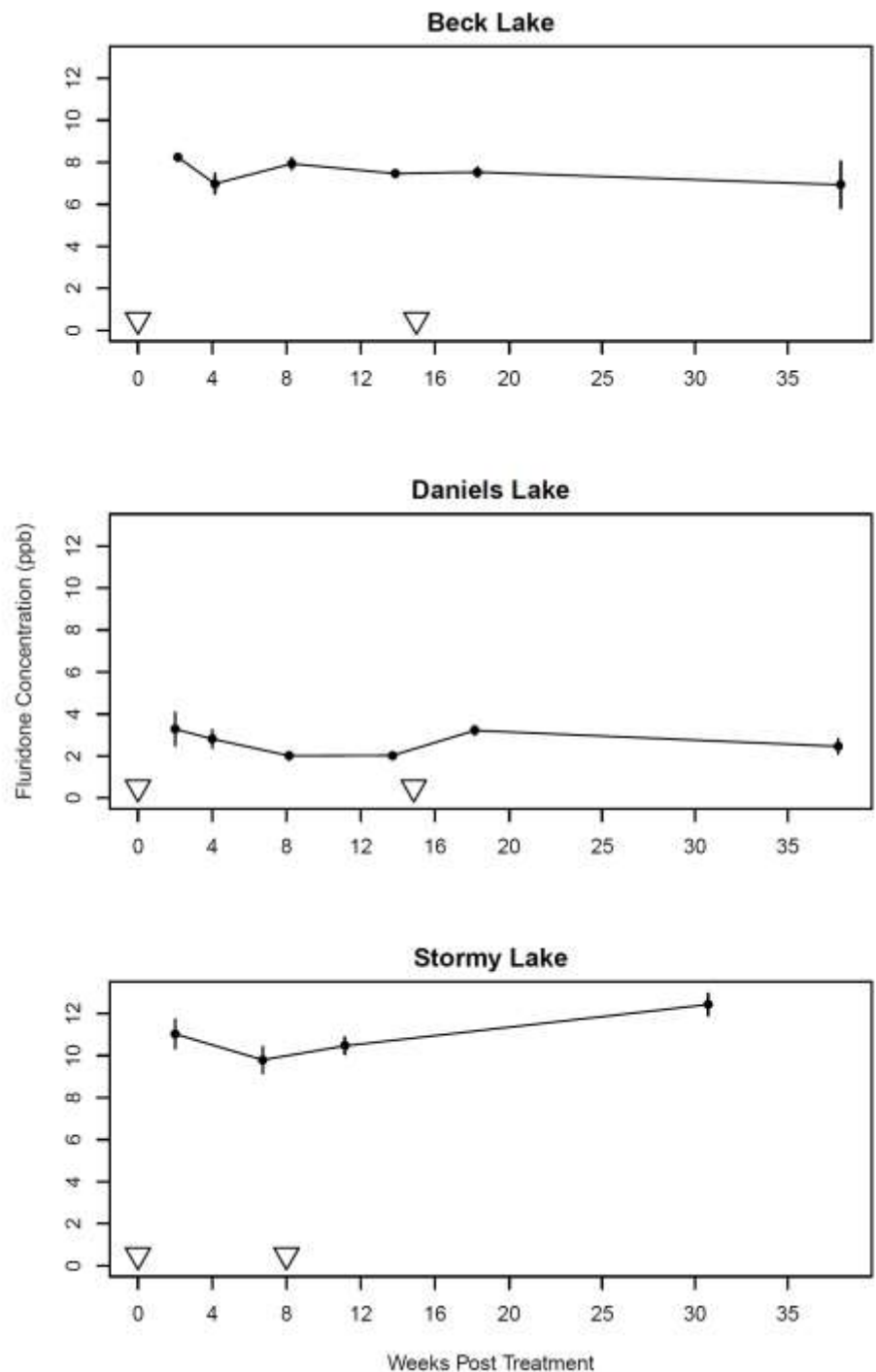
WPT
FIND

LIGHT
POWER

Is it working?



1st application (Beck, Daniels) 3-4 June
1st application (Stormy) 23 July
2nd application 16-17 Sept



Is it working?



2 weeks (Stormy)

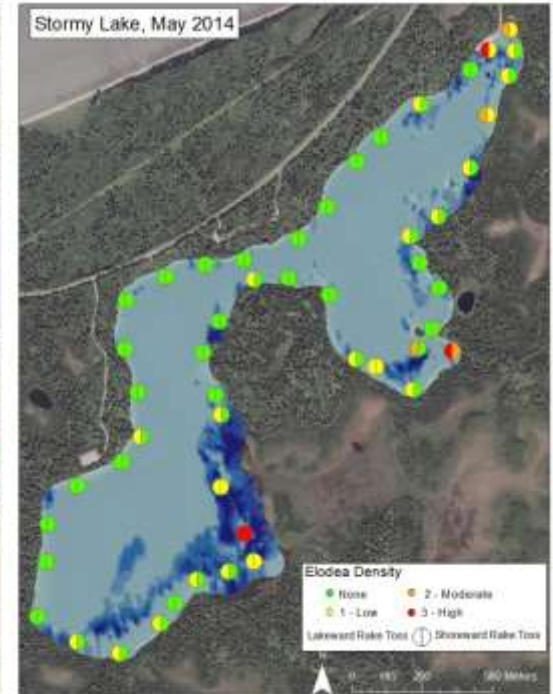
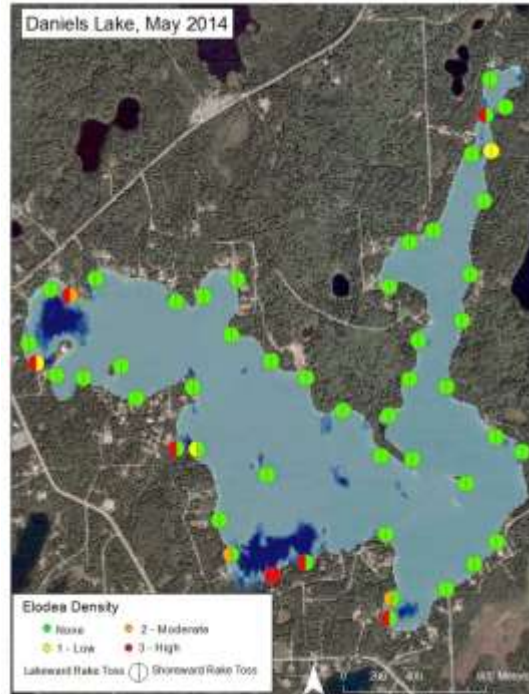
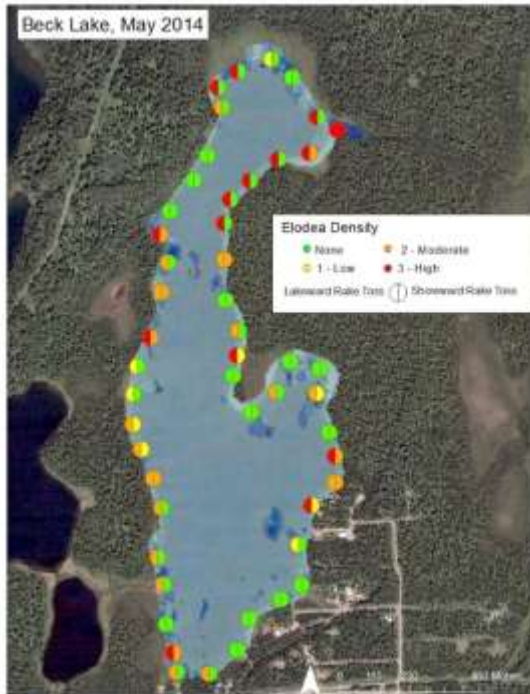


8 weeks (Beck)



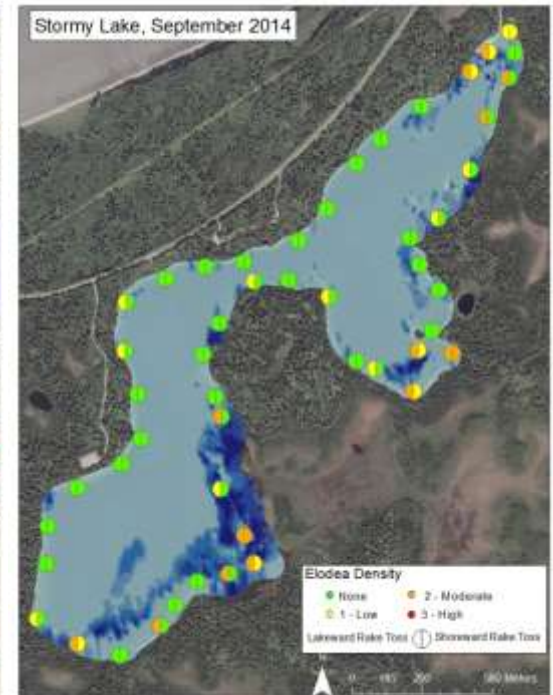
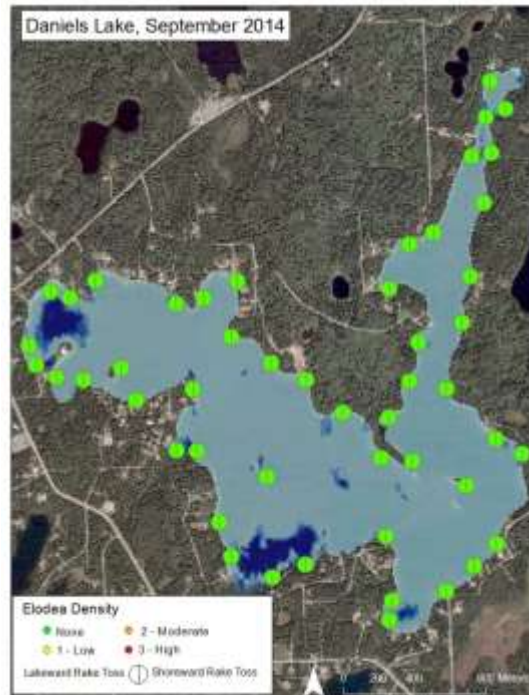
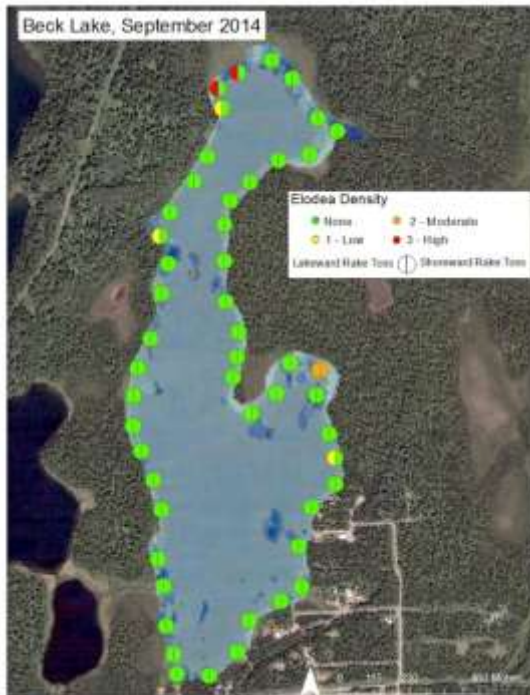
14 weeks (Beck)

Is it working?



LAKE	Beck		Daniels		Stormy	
TREATMENT	PRE	POST	PRE	POST	PRE	POST
% occurrence	70		22		50	
Mean relative abundance	1.49		1.55		0.75	

Is it working?



LAKE	Beck		Daniels		Stormy	
TREATMENT	PRE	POST	PRE	POST	PRE	POST
% occurrence	70	12	22	0	50	46
Mean relative abundance	1.49	0.18	1.55	0	0.75	0.78

Is it working?



February 2013



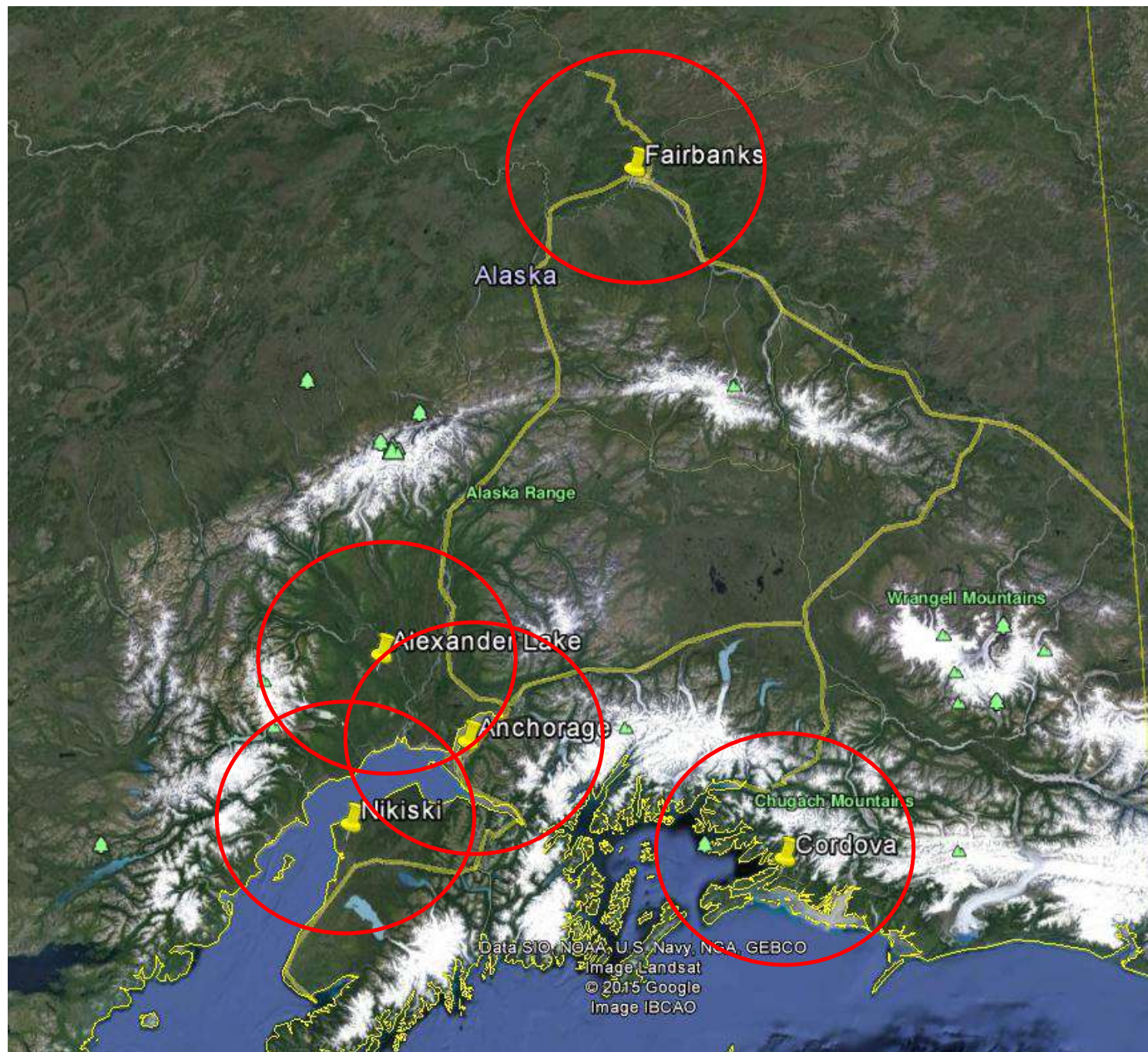
February 2015

Early Detection Rapid Response

Sep 2012	Elodea detected in Stormy Lake
Oct 2012	Elodea detected in Daniels Lake
Feb 2013	1 st public landowner meeting in Nikiski Preliminary survey of Daniels Lake
Mar 2013	1 st face-to-face meeting of Elodea technical working group
Apr 2013	DEC permit application submitted for diquat Live elodea samples sent to SePRO
May 2013	DEC permit application submitted for fluridone Enhanced survey of Daniels Lake Presentation/petition to KPB Assembly
Jun 2013	Begin surveys of other lakes on the Kenai Peninsula (\$55K) DEC permit to apply diquat approved APDES approved for Stormy, Daniels Lakes \$40K received from KBP
Jul 2013	Elodea detected in Beck Lake
Aug 2013	EA approved (AK-DNR/USFWS)
Sep 2013	Complete survey of 65 other lakes on the Kenai Peninsula
Dec 2014	First draft of IPM completed
Jan 2014	\$40K received from National Fish & Wildlife Foundation
Feb 2014	DEC permit application for fluridone formally resubmitted APDES modification to include Beck Lake approved
Mar 2014	2 nd face-to-face meeting of Elodea technical working group
Apr 2014	DEC permit to apply fluridone approved 2 nd public landowner meeting in Nikiski 2-hr special session at KP-CWMA annual conference \$155K (2 grants) received from USFWS
May 2014	Pre-treatment surveys to monitor product efficacy (50 sites per lake) Pre-treatment surveys of water quality and non-target effects \$120K received from KP Fish Habitat Partnership \$400K received from State of Alaska (through KPB) Supplemental EA approved (to include Beck Lake) USFWS Pesticide Use Permits approved Nets installed at outlets of Daniels and Beck Lakes (CIAA)
Jun 2014	1st herbicide treatments (Beck, Daniels Lake)

Why we can't wait.....





Lessons learned...

- **Clear management goal**
 - eradicate from Kenai Peninsula
 - understand the problem (no jurisdictional boundaries, no time to waste)
- **Dedicated interagency project team**
 - include private landowners
- **Find the right experts**
 - SePRO, Lars Anderson, Don Les
- **Adaptive IPM plan**
 - don't be discouraged by lack of funds if you have clarity of vision
- **Outreach to generate support**
 - general public, targeted stakeholders, potential funders
- **The hard work is planning, fund raising, NEPA/permit process**
 - — easy work is field application

A close-up photograph showing a person's hand holding a black metal frame. The frame is covered with a dense mass of green and brown aquatic plants, possibly seaweed or algae, which are dripping with water. The background is a body of water with some green lily pads visible. The text "Questions???" is overlaid in yellow on the plants.

Questions???

