LaDredge Outdoors

Jumbo Perch Reproduction Project 2007

Reel Weeds™
By LaDredge Outdoors

LaDredge Outdoors
Underwater Structure Products

About *Reel Weeds*™

- LaDredge Outdoors has spent nearly 7 years designing this type of artificial weed, including hundreds of hours of testing in extreme winter conditions, improving what was not right, and building the perfect artificial underwater weed for fishermen and fisheries.
- Although appearance and familiarity to fish is high on the list, quality, safety and durability exceeds everything else. Our product line has been custom designed and manufactured specifically with these factors in mind. It can withstand extreme weather conditions and is completely safe in our fisheries. We will cut no corners to provide to you the best possible artificial weed structure.
- We caution anybody in constructing and/or submerging into our fisheries a homemade weed structure with products purchased from pet stores, craft stores, etc. Those products are in no way designed for this type of application, but simply intended and constructed for household decor, or heated aquariums.

The following slides illustrate data referencing the LaDredge Outdoors, LLC ***Reel Weeds***™ ***Jumbo Perch*** spawning habitat experiment conducted in the spring of 2007 in a eastern South Dakota lake.

In this experiment we deployed a line of 50 ***Reel Weeds***™ spaced one foot apart in five different "stations" throughout this fishery. Total of 250 ***Reel Weeds***™.

Deploying *Reel Weeds*™

A line of 50 weighted *Reel Weeds*™ spaced one foot apart.
Total of 150 feet of surface area for spawning per station.

Deploying *Reel Weeds*™

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Deploying *Reel Weeds*™

A line of 50 weighted *Reel Weeds*™ submerged. Markers every 10 feet for visibility and retrieval purposes.

Deploying *Reel Weeds*™

Station results

Station 1 Data Log

Reel Weeds Perch Spawning Habitat - Data Log

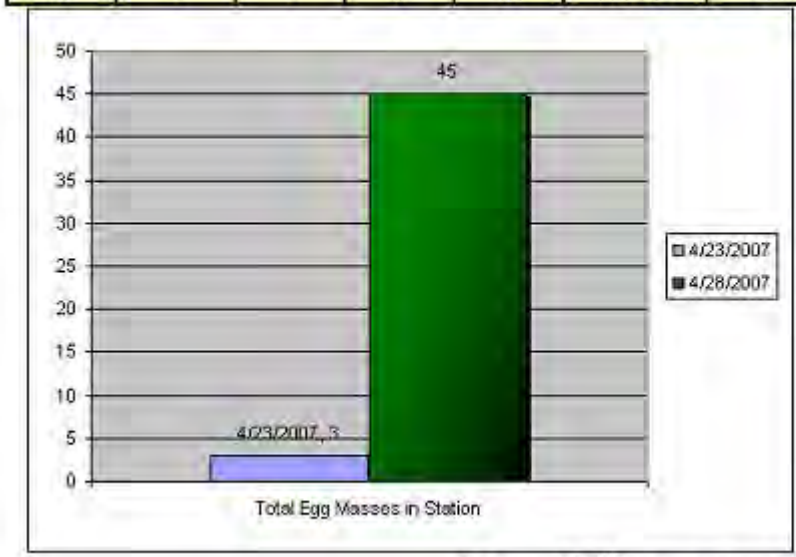
Station 1 detail Report

Date of Reel Weeds Deployment:	4/21/2007
Lake	Not disclosed

Station 1:	
Description:	Rocky shoreline with some tree tops at each end. No natural weeds in area. Northwest end of lake.
Deployment remarks:	50 Reel Weeds submerged in 6 feet of water. Reel Weeds were each 3 feet in length, weighted to the bottom and stood straight up, leaving 3 feet of water between surface and top of Reel Weed. Distance between Reel Weeds 1 foot.
Surface Water Temp when deployed:	46
Bottom Water Temp when deployed:	45

	Date	Surface temp	Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses in Station	Average Egg Masses per RW	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	3	0	0	3	0.06	75000	375
Visitation date 2:	4/28/2007	55	54	26	5	3	45	0.9	1125000	5625
Total →				26	5	3	45	0.9	1125000	5625

Observations:Very evident that some old some new egg masses. Sometimes on the same weed. We drifted around entire area with underwater camera submerged. There were some sunken branches but no egg masses were found other than on the Reel Weeds.



* Average 25,000 eggs per mass

** Survival rate based on 1/2 of 1%

Station 2 Data Log

Reel Weeds Perch Spawning Habitat - Data Log

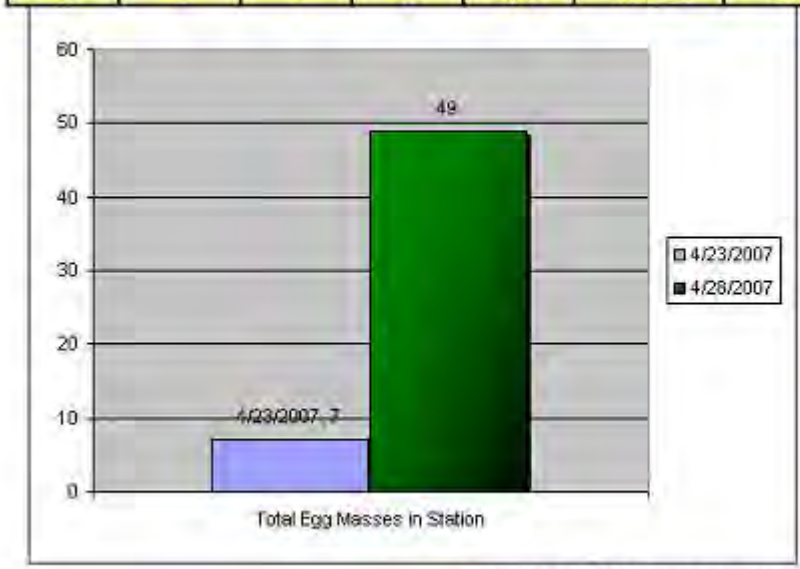
Station 2 detail Report

Date of Reel Weeds Deployment:	4/21/2007
Lake	Not disclosed

Station 2:	
Description:	Rocky Shoreline with submerged logs. Located southwest side of lake.
Deployment remarks:	50 Reel Weeds submerged in 6 feet of water. Reel Weeds were each 3 feet in length, weighted to the bottom and stood straight up, leaving 3 feet of water between surface and top of Reel Weed. Distance between Reel Weeds 1 foot.
Surface Water Temp when deployed:	48
Bottom Water Temp when deployed:	46

	Date	Surface temp	Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses in Station	Average Egg Masses per RW	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	3	2	0	7	0.14	175000	875
Visitation date 2:	4/28/2007	56	56	28	6	3	49	0.98	1225000	6125
Total →				28	6	3	49	0.98	1225000	6125

Observations: Observed submerged logs with underwater camera. No egg masses were found other than on Reel Weeds. With southerly winds this is the most protected station.



* Average 25,000 eggs per mass

** Survival rate based on 1/2 of 1%

Station 3 Data Log

Reel Weeds Perch Spawning Habitat - Data Log

Station 3 detail Report

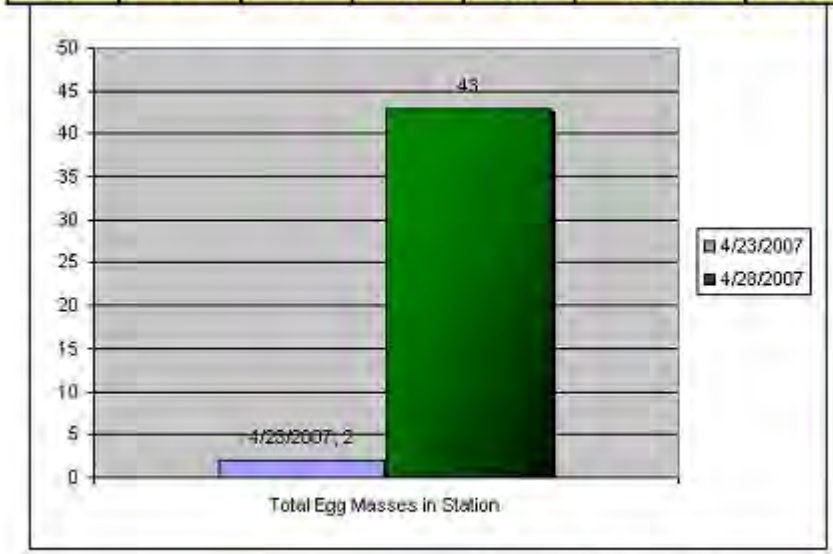
Date of Reel Weeds Deployment:	4/21/2007
Lake	Not disclosed

Station 3:

Description:	Trees on shoreline with many branches submerged due to high water. Located north of south lake access.
Deployment remarks:	50 Reel Weeds submerged in 6 feet of water. Reel Weeds were each 3 feet in length, weighted to the bottom and stood straight up, leaving 3 feet of water between surface and top of Reel Weed. Distance between Reel Weeds 1 foot.
Surface Water Temp when deployed:	46
Bottom Water Temp when deployed:	46

	Date	Surface temp	Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses in Station	Average Egg Masses per RW	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	2	0	0	2	0.04	50000	250
Visitation date 2:	4/28/2007	54	56	26	4	3	43	0.86	1075000	5375
Total →				26	4	3	43	0.86	1075000	5375

Observations: A popular fishing area in the winter and typically good populations of perch. Expected the most eggs due to all the surrounding structure but that was not validated. We observed no egg masses on the branches, limbs, logs, etc. in area



* Average 25,000 eggs per mass

** Survival rate based on 1/2 of 1%

Station 4 Data Log

Reel Weeds Perch Spawning Habitat - Data Log

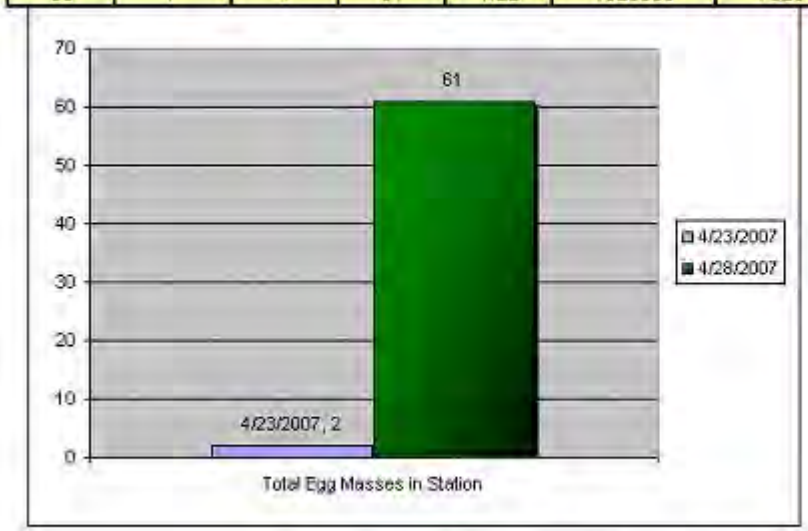
Station 4 detail Report

Date of Reel Weeds Deployment:	4/21/2007
Lake	Not disclosed

Station 4:	
Description:	Rocky shoreline. Very firm bottom. No natural weeds in area. Northeast side of lake.
Deployment remarks:	50 Reel Weeds submerged in 6 feet of water. Reel Weeds were each 3 feet in length, weighted to the bottom and stood straight up, leaving 3 feet of water between surface and top of Reel Weed. Distance between Reel Weeds 1 foot.
Surface Water Temp when deployed:	46
Bottom Water Temp when deployed:	46

	Date	Surface temp	Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses in Station	Average Egg Masses per RW	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	2	0	0	2	0.04	50000	250
Visitation date 2:	4/28/2007	56	55	35	7	4	61	1.22	1525000	7625
Total →				35	7	4	61	1.22	1525000	7625

Observations: With very few egg masses found one week earlier we found incredible numbers for this location. Nothing stands out as being an attractive area other than it is in the narrows heading to the northeast.



* Average 25,000 eggs per mass
** Survival rate based on 1/2 of 1%

Station 5 Data Log

Reel Weeds Perch Spawning Habitat - Data Log

Station 5 detail Report

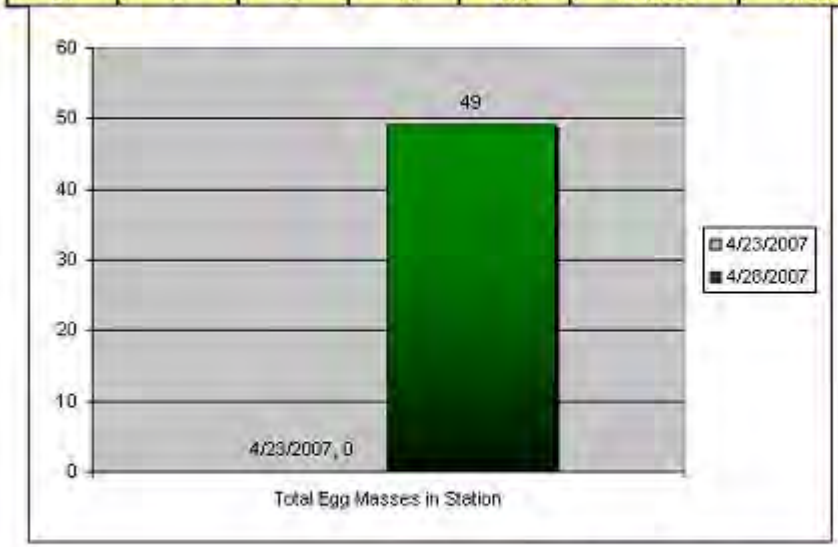
Date of Reel Weeds Deployment:	4/21/2007
Lake	Not disclosed

Station 5:

Description:	No structure on content to the shoreline. Muddy bottom. Located in far northeast side of lake.
Deployment remarks:	50 Reel Weeds submerged in 6 feet of water. Reel Weeds were each 3 feet in length, weighted to the bottom and stood straight up, leaving 3 feet of water between surface and top of Reel Weed. Distance between Reel Weeds 1 foot.
Surface Water Temp when deployed:	48
Bottom Water Temp when deployed:	48

	Date	Surface temp	Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses in Station	Average Egg Masses per RW	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	0	0	0	0	0	0	0
Visitation date 2:	4/26/2007	56	56	24	5	5	49	0.98	1225000	6125
Total →				24	5	5	49	0.98	1225000	6125

Observations: Not much of anything for structure in the area above or below water line. This was more of an experiment station due to there being nothing at all around and based on the first visitation seemed to develop a "no show" for the fish. To the contrary, this station proved just as strong as others.



* Average 25,000 eggs per mass

** Survival rate based on 1/2 of 1%

Data Summary

Reel Weeds Perch Spawning Habitat - Data Log

Summary Sheet

	Date	Average Surface temp	Average Bottom temp	Number of RWs with 1 Egg Mass	Number of RWs with 2 Egg Masses	Number of RWs with 3 Egg Masses	Total Egg Masses	Average Egg Masses per RW	Total RW with any Egg Masses	Total RW w/o any Egg Masses	% of RW with Egg masses	Estimated total Eggs at station *	Survival numbers **
Visitation date 1:	4/23/2007	48	48	10	2	0	14	0.056	12	238	5%	350000	1750
Visitation date 2:	4/28/2007	56	56	139	27	18	247	0.988	184	66	74%	6175000	30875
Total →				139	27	18	247	0.988	184	66	0.736	6175000	**30875**

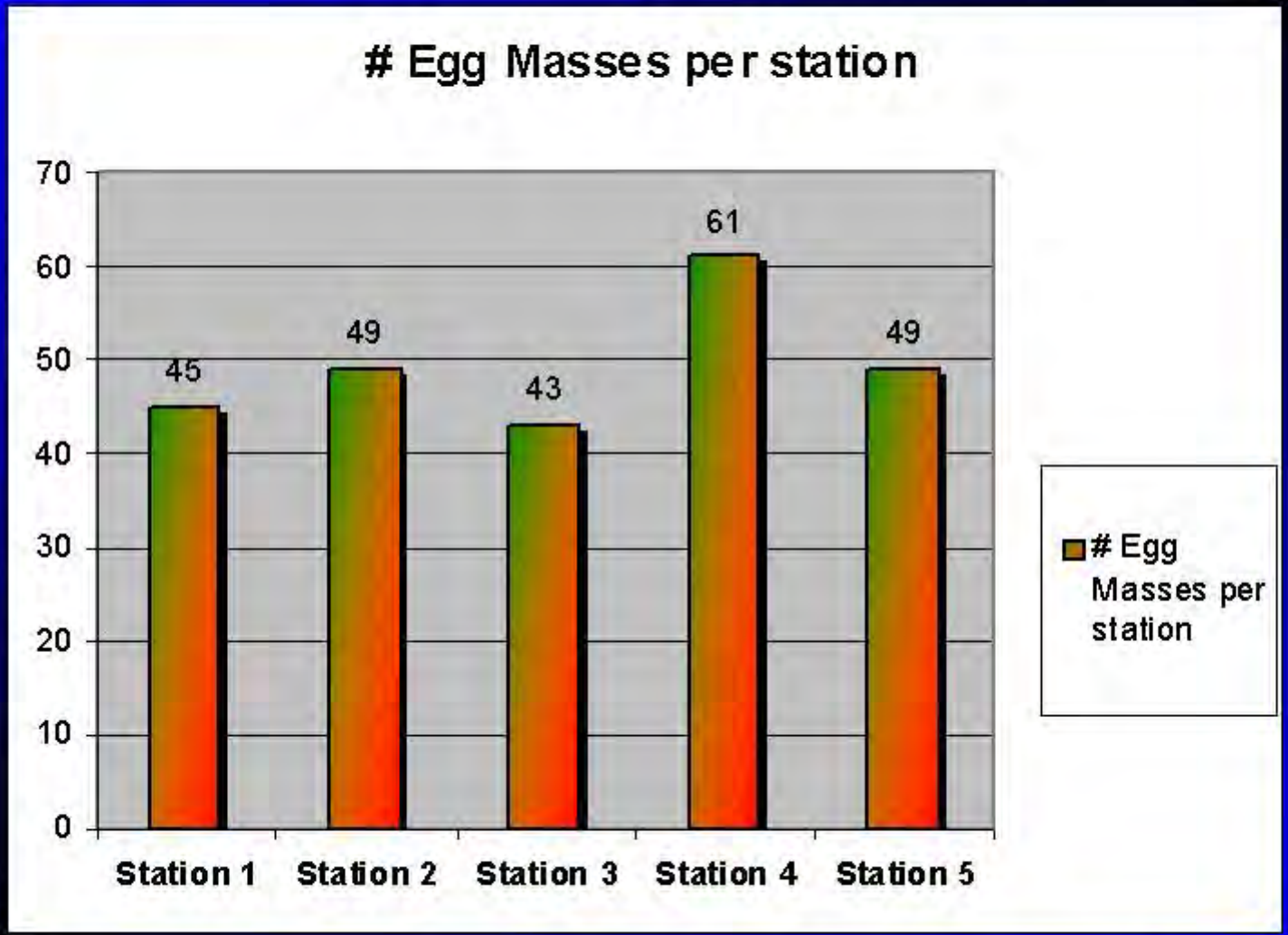
* Average 25,000 eggs per mass

** Survival rate based on 1/2 of 1%

Key Notes

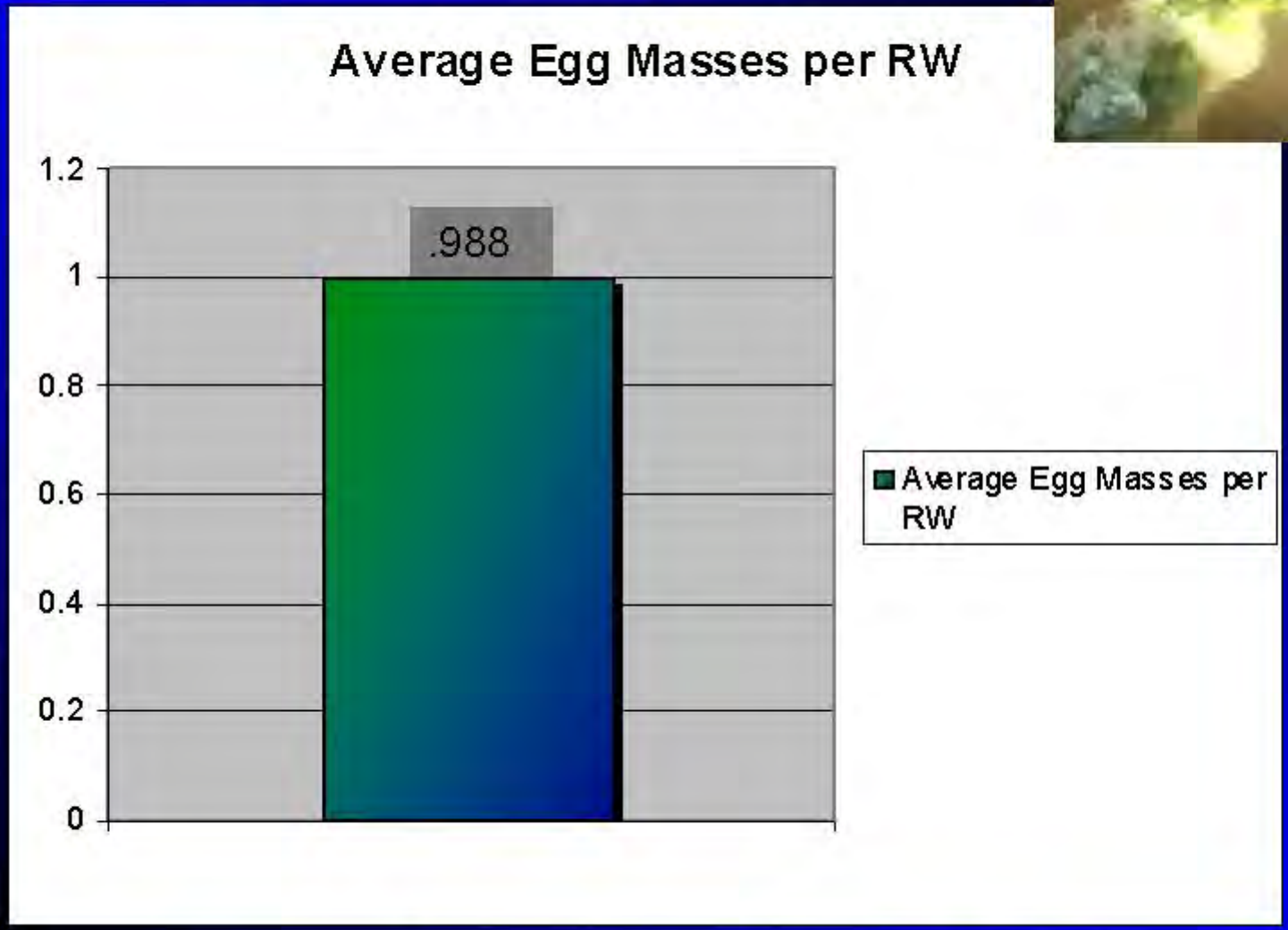
- Total of 247 egg masses
- Average masses per ***Reel Weed***™ .988
- 184 of the 250 ***Reel Weeds***™ had one or more masses present
- At a .5 of 1% survival factor, 30,875 perch should survive due to this experiment

Data Summary



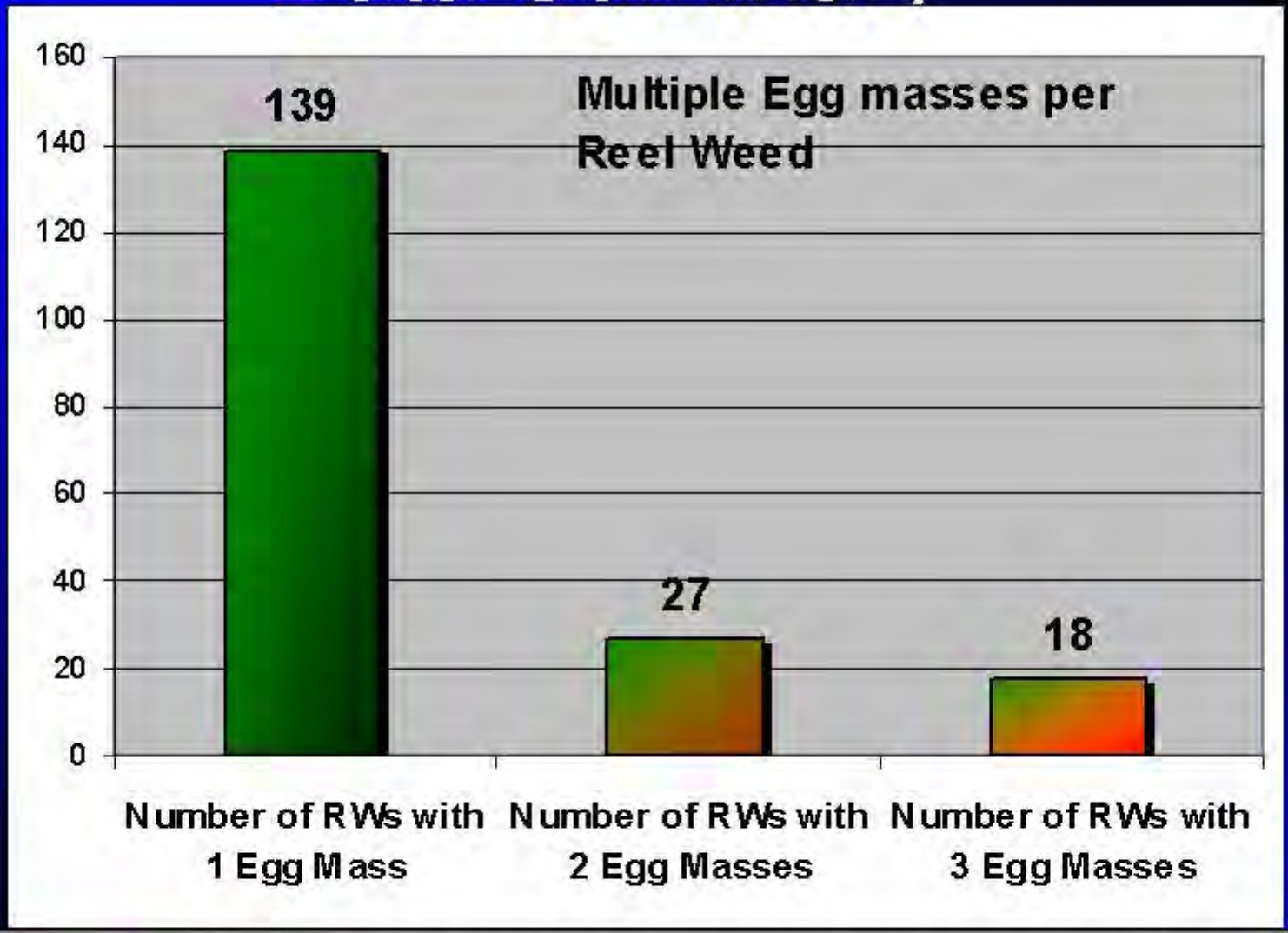
Notes: Fairly consistent population of egg masses throughout stations.

Data Summary



Notes: .988 egg masses PER ***Reel Weeds***™

Data Summary



Notes: 45 ***Reel Weeds***™ had more than 1 egg mass present. Some may have had more than 3 masses present but was difficult to determine due to it being completely encased in eggs. Majority had 1 egg mass present. Many multiple egg mass ***Reel Weeds***™ had new and old egg masses present.

The following slides include a series of above and under water photographs. The ***Reel Weeds***™ were lifted to the surface for analysis and for above-water photography then lowered back down immediately thereafter.

Video was also obtained for future reference.

Ascended 3 foot strands of ***Reel Weeds***™ to the surface for photography

- Ascended 3 foot strands of ***Reel Weeds***™ to the surface for photography

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Close-up photos

Egg Masses *Reel Weeds™*

Close-up photos

A double Egg Mass *Reel Weed*™

Close-up photos

1 Egg Mass that measured almost 4 feet long.

Close-up photos

Multiple Egg Masses

Close-up photos

Egg Masses

Close-up photos

Egg Mass

Close-up photos

Egg Mass

Close-up photos

Egg Mass

Eggs completely embedded in ***Reel Weeds***™

Close-up photos

Egg Mass

Close-up photos

Egg Mass

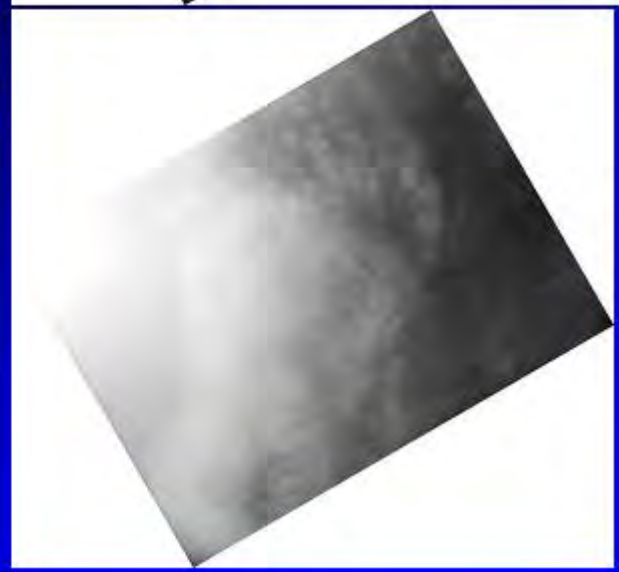
Close-up photos

1 Egg Mass that is secured in ***Reel Weeds***™

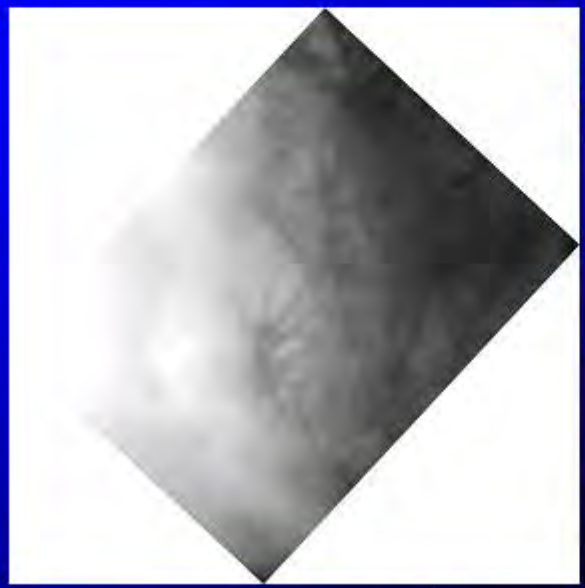
Close-up photos

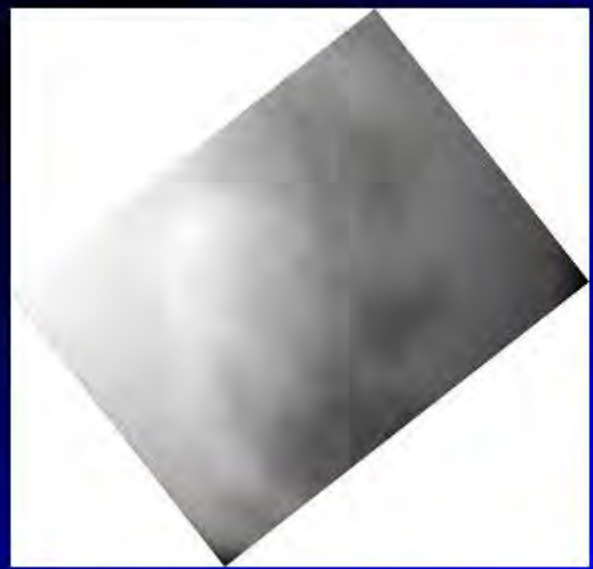
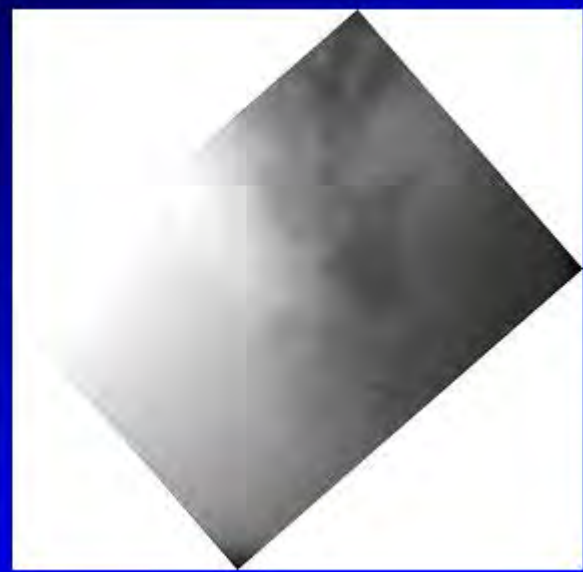
Extreme close up of Egg Mass in ***Reel Weeds***™

- Underwater photography of ***Reel Weeds***™ with egg masses



- Underwater photography of ***Reel Weeds***™ with egg masses



Research on flooded trees

- Checked three areas with significant numbers of flooded trees with hanging branches, etc. No egg masses were found.

Research on Cattails

- Checked three areas with significant numbers of Cattails. No egg masses were found.

Data Summary and Conclusions

- We spent a significant amount of time and effort searching (via an underwater camera) all other forms of structure in this fishery for egg masses. Trees, limbs, branches, logs, shorelines, cattails, etc. etc. We found no egg masses on any of these. Particularly in one of the most "wooded" areas of the lake (see station 3) the ***Reel Weeds***™ were only feet from flooded trees and although we found 43 egg masses on the ***Reel Weeds***™ none were present on the tree limbs.
- Within 43 hours of deploying the ***Reel Weeds***™ we had our first 14 egg masses. From that point on and as the water temperature increased another 204 egg masses appeared in the next 7 days.
- The surface area we covered with our 5 stations was extremely small in proportion to the size of this fishery. Additional coverage would have yielded incredible results.
- Egg masses adhere/embed very well with the spiny sprigs of ***Reel Weeds***™

Data Summary and Conclusions

- Due to the mobility, compactness and reusability of ***Reel Weeds™*** year after year, far more coverage in many more fisheries could be achieved with decreased labor-intensiveness and costs associated with traditional methods of artificial spawning habitat.

- In addition to maintaining and improving Jumbo Perch fisheries, expanded perch spawning habitat programs could be initiated to maintain populations of fish higher in the food chain that depend on small perch for their refuge.

- ***Reel Weeds™*** present a very natural environment and replicate real weeds. In addition to the appearance, their swaying action enhances overall fertilization and oxygen levels of the eggs.

- Strategies for introducing ***Reel Weeds™*** as spawning habitat are unlimited. Whether utilizing "lines" or "clumps" it has been sufficiently proven that perch will heavily utilize ***Reel Weeds™*** for reproduction purposes.

Acknowledgements

LaDredge Outdoors acknowledges and sincerely thanks the following for their assistance and overall support in this project:

Dr. David Willis: South Dakota State University

Mark Ermer: South Dakota Game Fish and Parks, Regional Fisheries Manager

MarCum Technologies – Underwater Viewing Systems

LaDredge Outdoors

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Structure is Everything!

The End

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