Dredging Impacts on Sea Turtles: *Applying Lessons Learned*

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HeraldTribune.com
SOUTHWEST FLORIDA'S INFORMATION LEADER

Second sea turtle is killed, halting beach renourishment

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By WILL ROTHSCHILD
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For the second time in three months, the $21 million Longboat Key beach renourishment project has been stopped following the killing of a sea turtle during dredging.

It is unclear when the U.S. Army Corps of Engineers will allow the project to resume, meaning more delays for a project already six months behind schedule. The Corps also has the authority to halt the project permanently if it decides the threat of more sea turtle deaths is too great.

The dredging near the mouth of Tampa Bay was stopped for several weeks during the summer and fall because of storms. And the Corps shut down the project for five days in November after the first sea turtle was killed.

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TOP JOBS

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4 USACE Divisions

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90+ Hopper Projects

Risk Assessment Factors for Potential Dredging Impacts

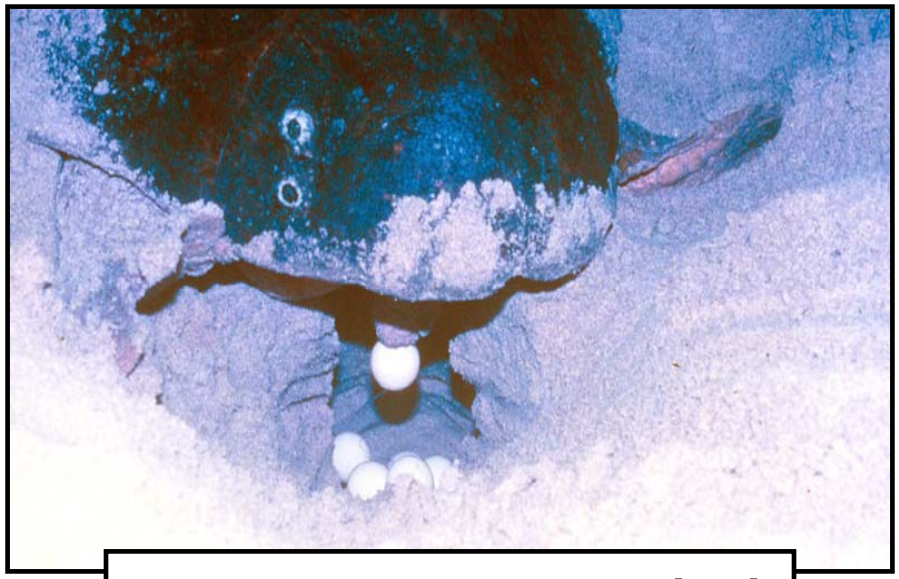
1. **Dredging project**
   - Location
   - Timing
   - Duration
   - Dredge & equipment type
   - Dredge operations
2. **Biological data**
   - Species occurrence & behavior
   - Habitat utilization at dredging site
3. **Protection Methods**
   - Availability
   - Effectiveness
4. **History of incidental take**
   - Temporal, spatial
   - Dredge type, vessel

1. Dredging Project

- *Location*
- *Timing*
- *Duration*
- *Dredge type*
- *Dredge operations*

2. Biological Data

- Species occurrence and behavior
- Habitat utilization at dredging site



90% Terrestrial

10% Aquatic

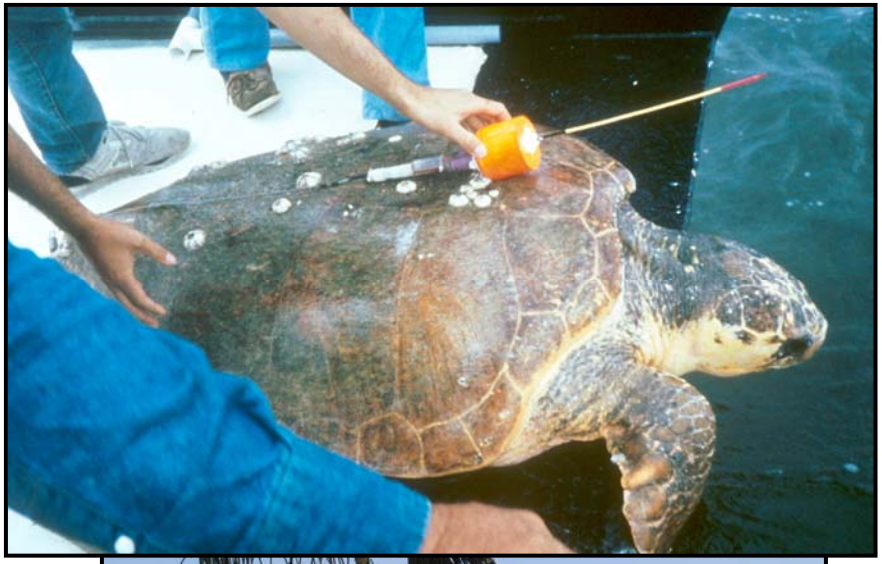
Known Biological Data

Sea Turtle Research Program

Biological Studies

Channel Use?

- Who?
- When?
- Where?
- How many?
- Behavior?



3. Protection Methods

(Implemented 1992)

- *Minimize hopper use*
- *Environmental window*
- *Draghead turtle deflector*
- *Trawling to move turtles*
- ~~*Acoustic detection*~~
- ~~*Acoustic dispersal*~~

Hopper Dredging Window

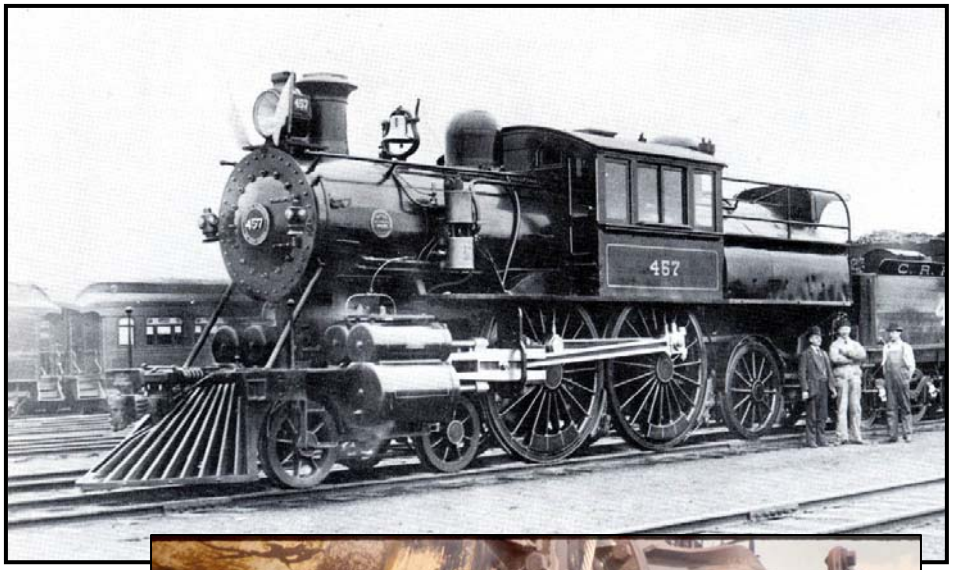
Based on Water Temp. & Nesting Timeline

Hatching

Nesting

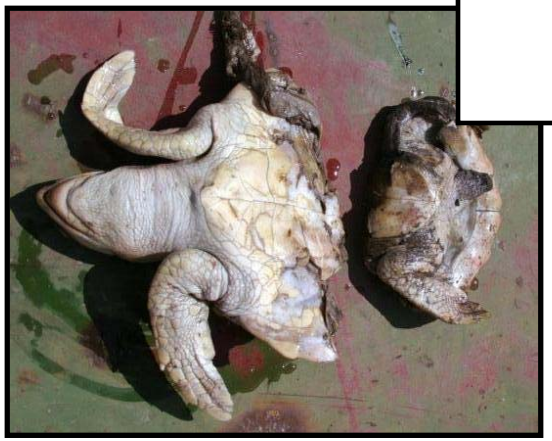
JAN FEB MAR APR ***MAY JUN JUL AUG SEP OCT*** *NOV DEC*

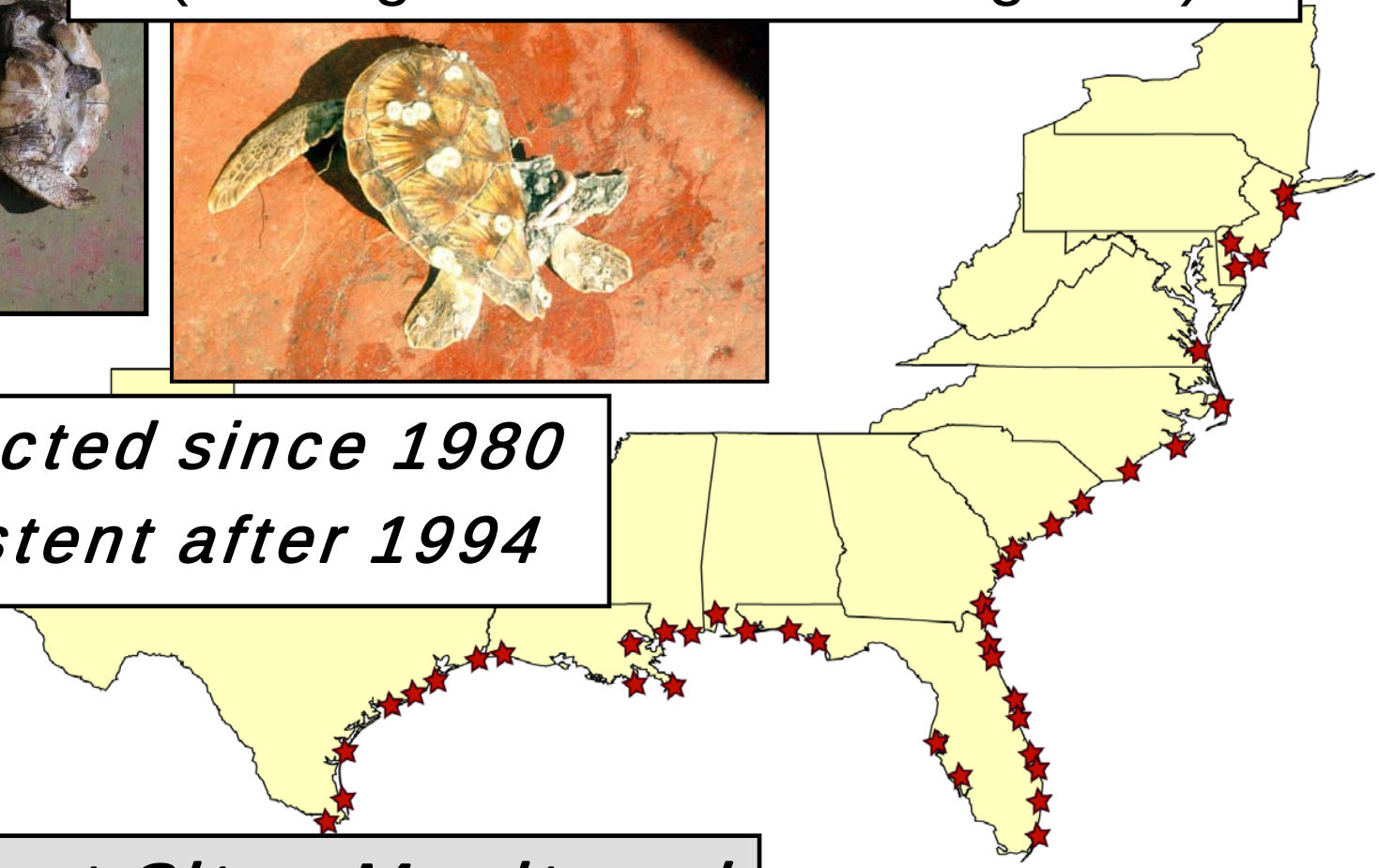
Turtle "Friendly" Bed-Levelers



4. History of Incidental Take

Incidental Take Monitoring
(Dredge Observer Program)

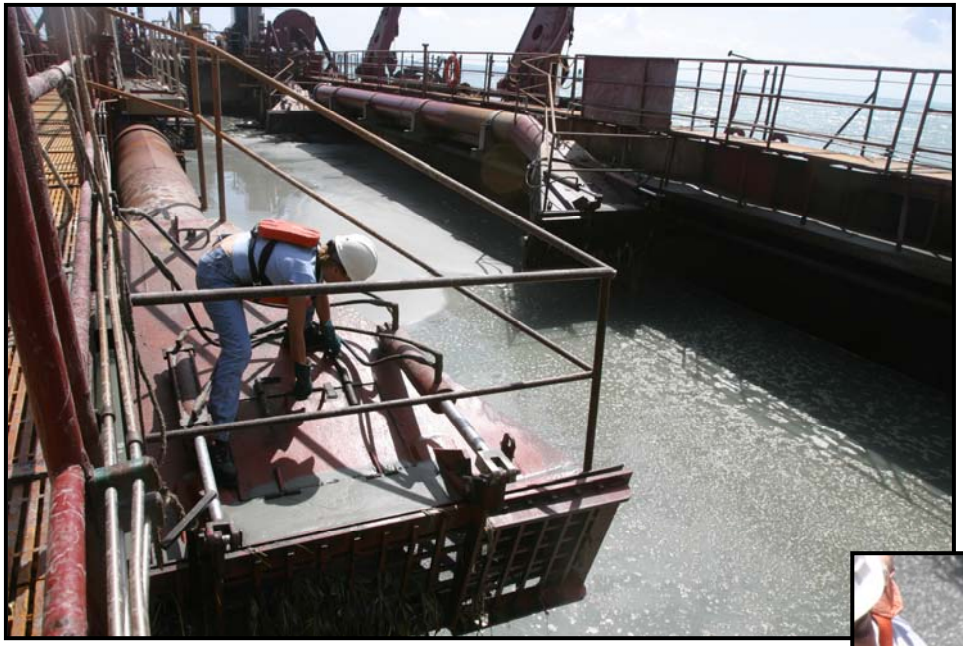




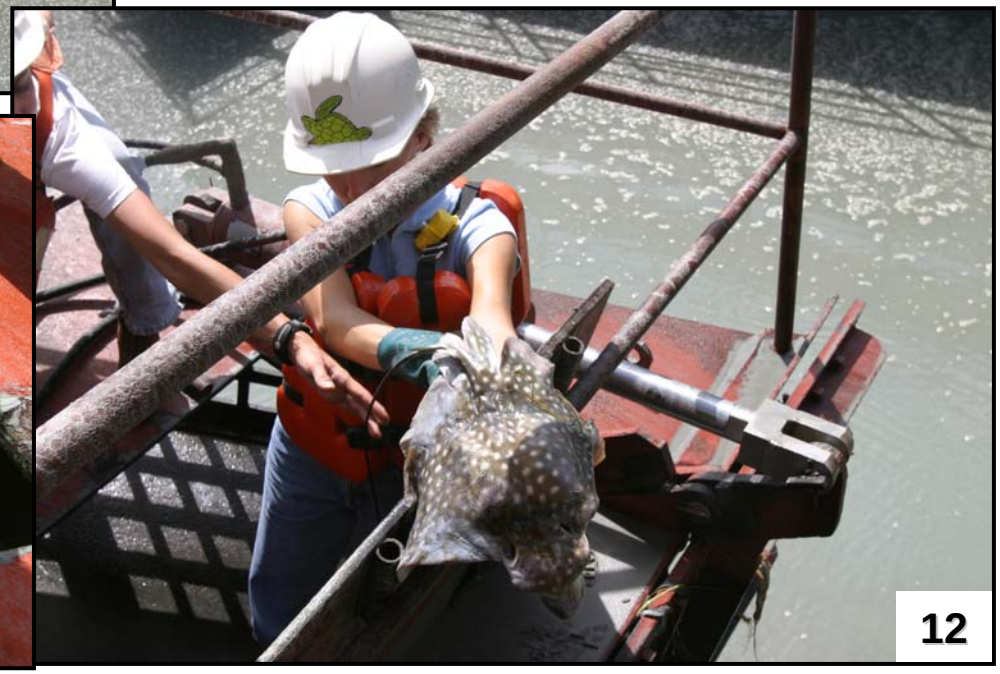
- *Conducted since 1980*
- *Consistent after 1994*

90+ Project Sites Monitored

Dredge Observer Program



- Sea turtles
- Sturgeon
- Shark / bycatch
- Marine mammals



http://el.erdc.usace.army.mil/seaturtles/

Annual Sea Turtle Take Limits

North Atlantic – North of North Carolina
Varies by Project

	REGIONAL Limits	
	Gulf	South Atlantic
Loggerheads	40	35
Kemp's ridley	20	7
Greens	14	7
Hawksbills	4	2
Leatherbacks	None designated	

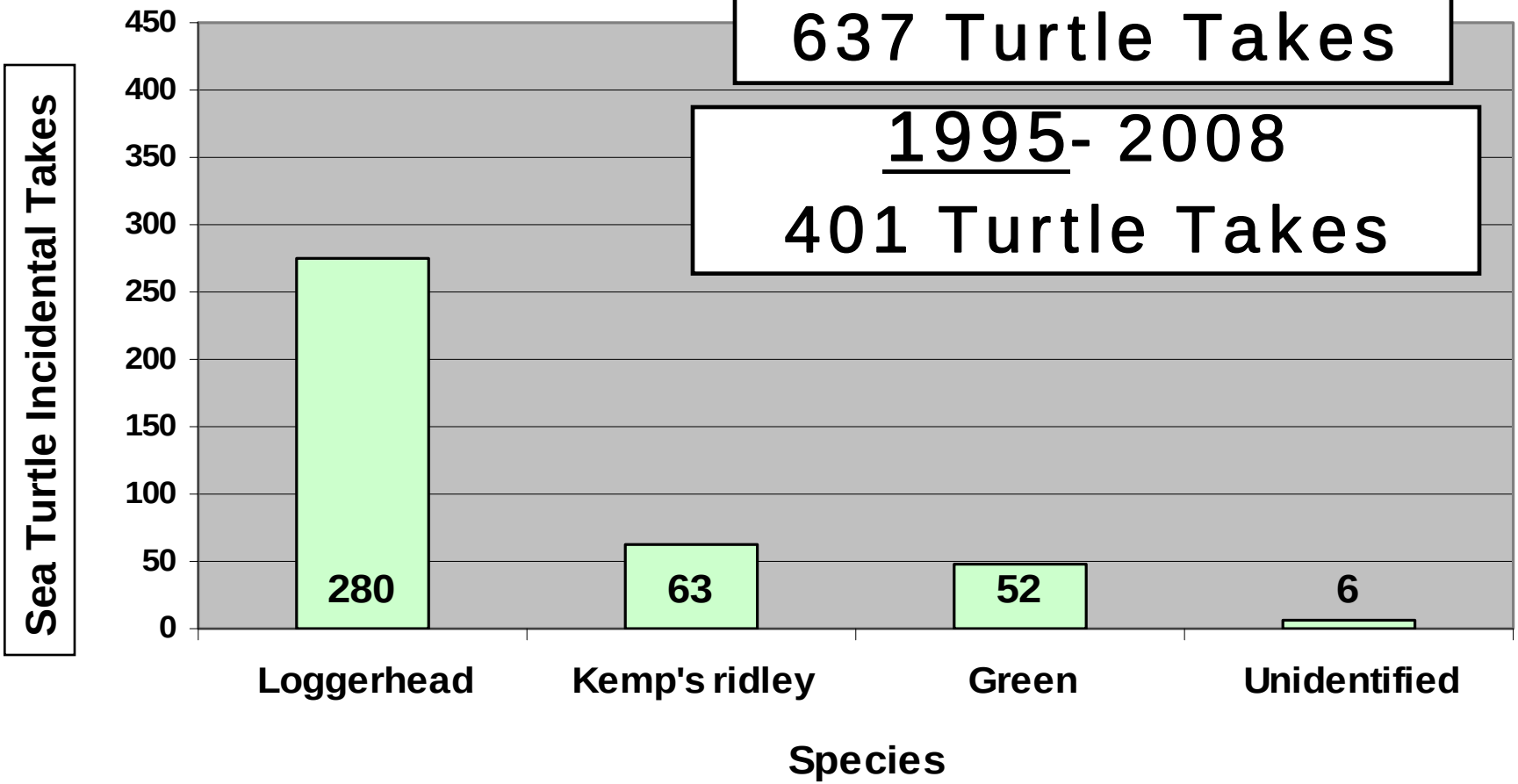
Documented Sea Turtle Takes

1980 - 2008

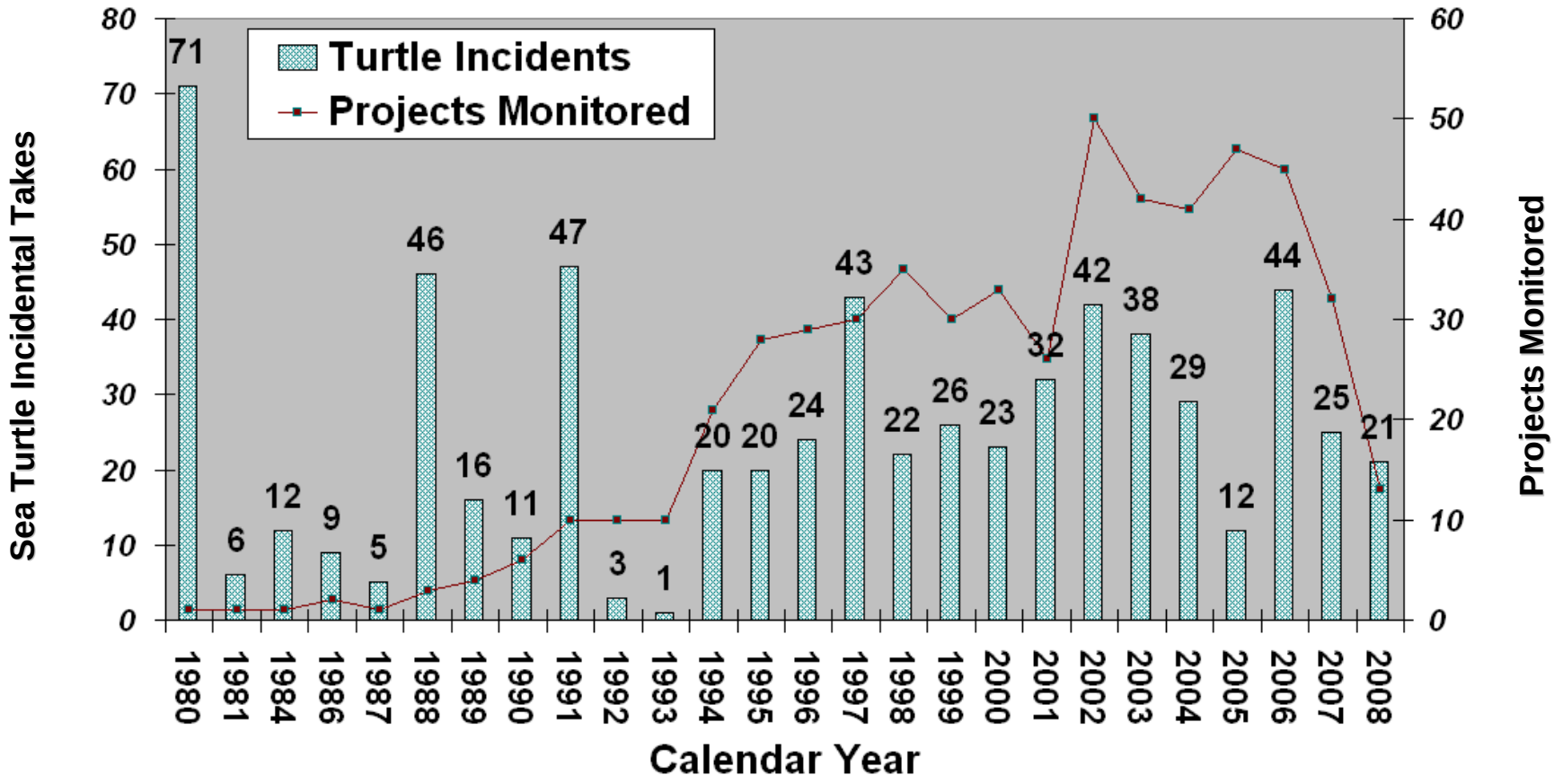
637 Turtle Takes

1995- 2008

401 Turtle Takes

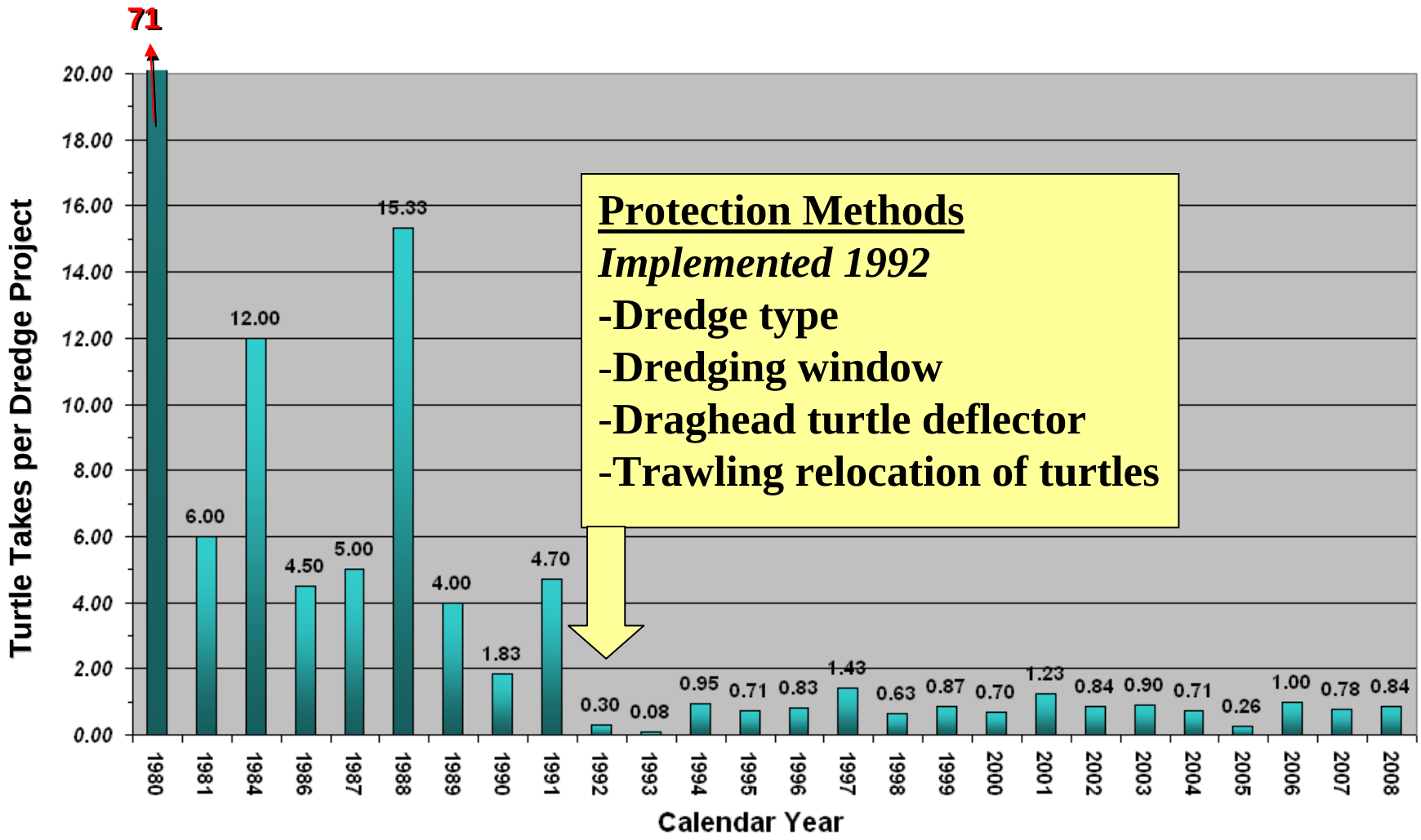


Annual Sea Turtle Takes & Dredge Projects Monitored
(1980 – 2008)



Annual Turtle Takes/Project

(1980 - 2008)



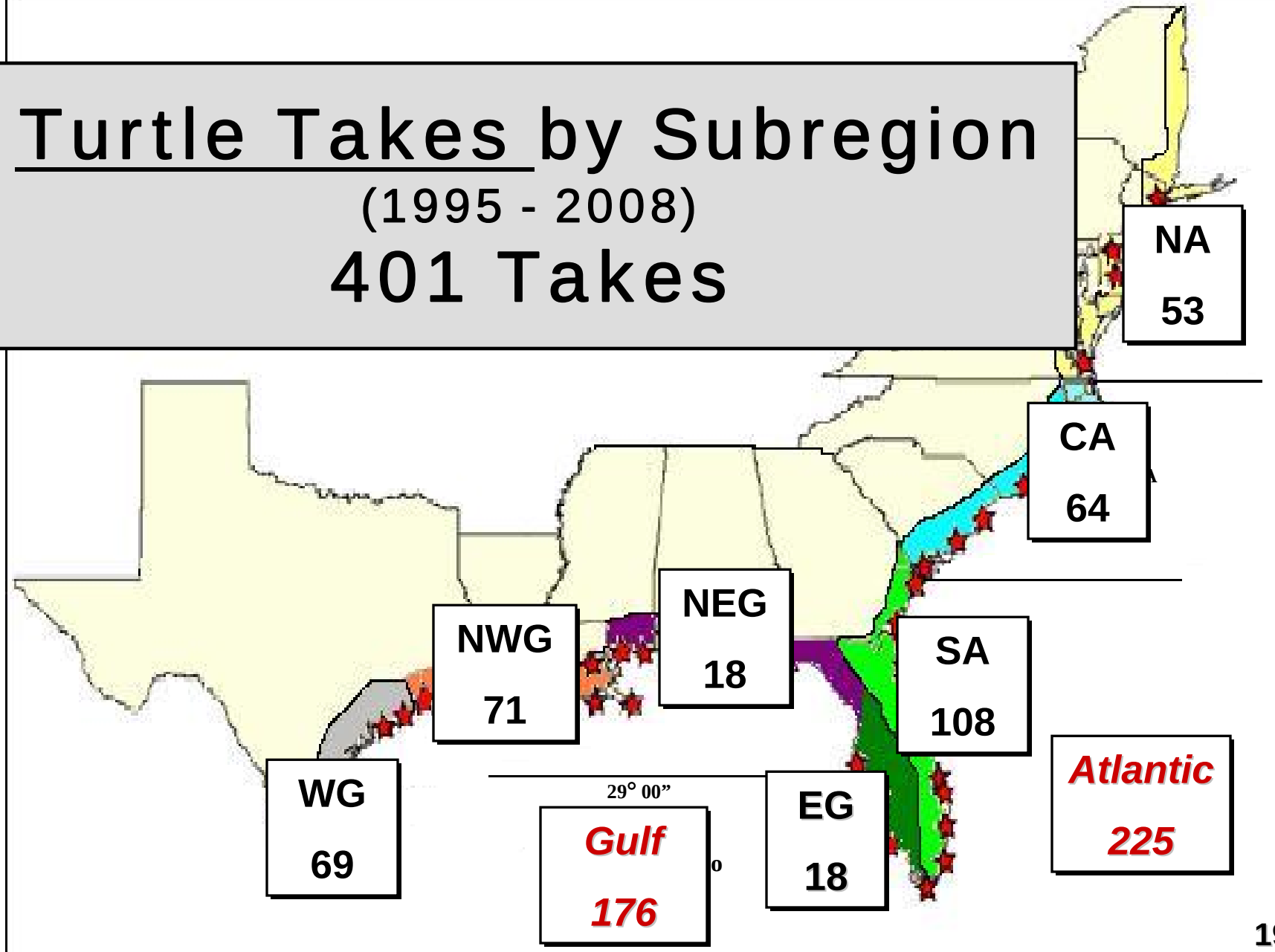
TURTLE HABITAT SUBREGIONS

Subregion	*USACE District*
West Gulf	**Galveston**
Northwest Gulf	**Galveston & New Orleans**
Northeast Gulf	**Mobile**
East Gulf	**Jacksonville**
South Atlantic	**Savannah & Jacksonville**
Central Atlantic	**Wilmington & Charleston**
North Atlantic	**Norfolk, Baltimore, New York, Philadelphia, New England**

Turtle Takes by Subregion

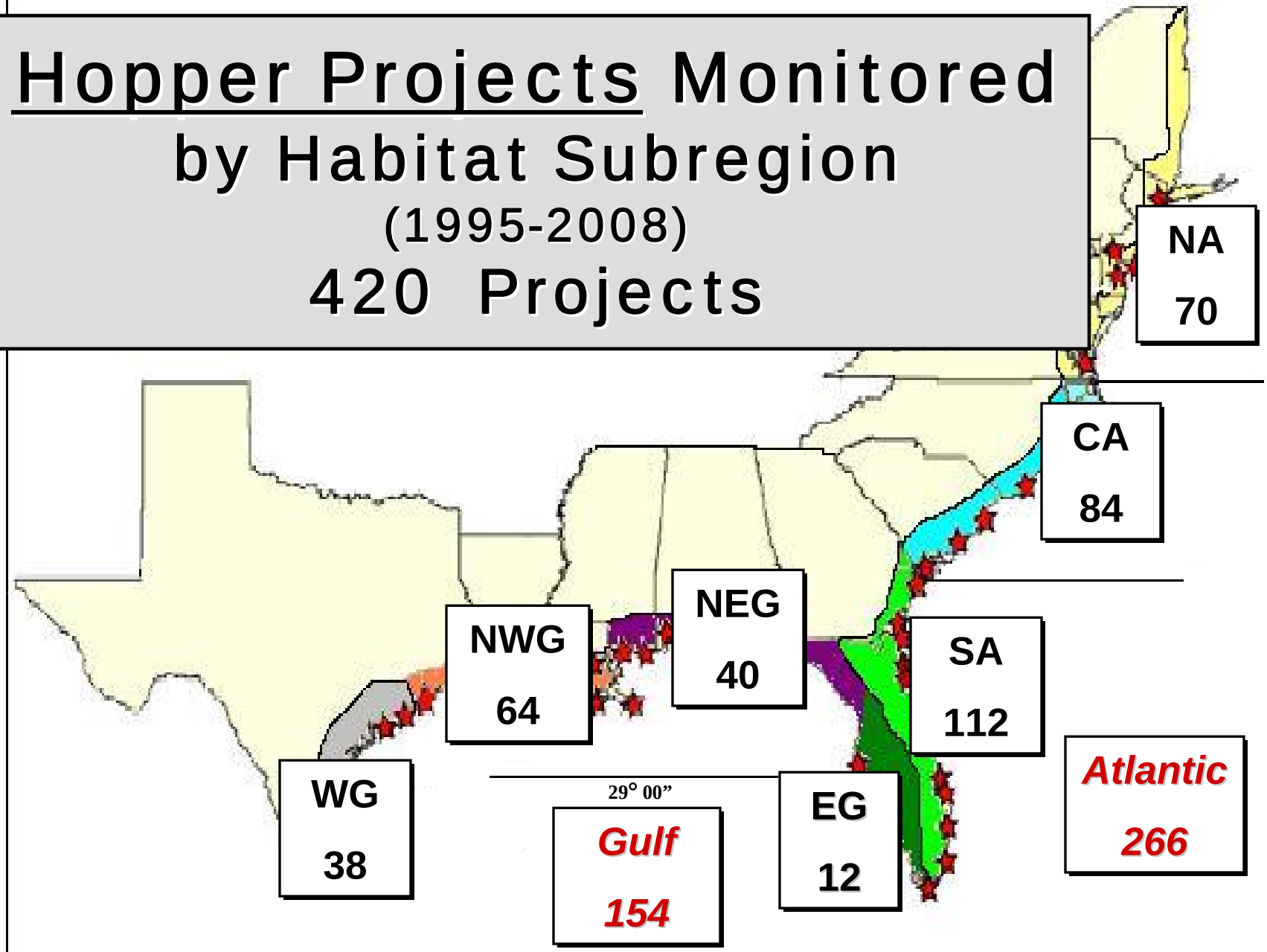
(1995 - 2008)

401 Takes



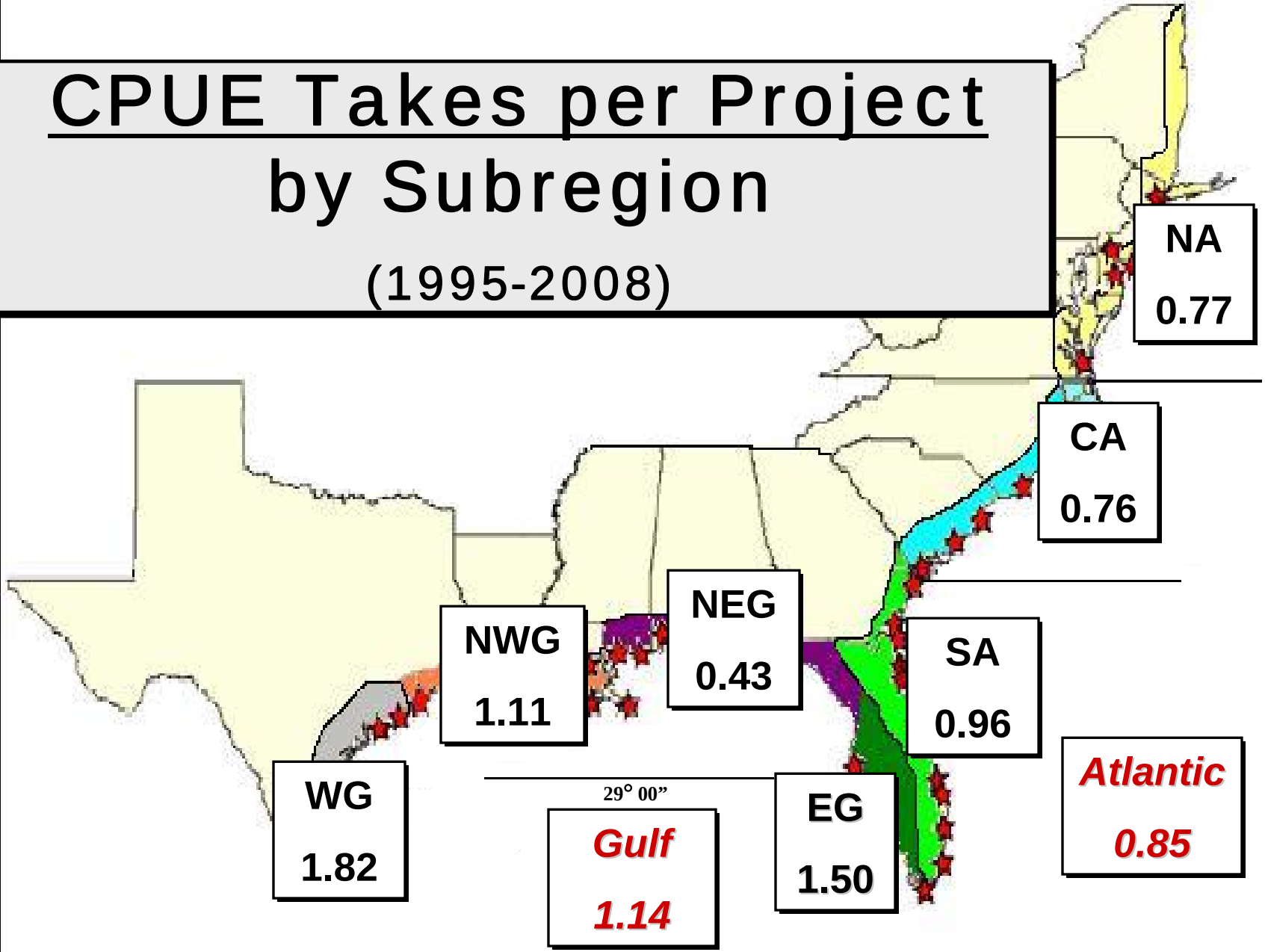
Hopper Projects Monitored
by Habitat Subregion
(1995-2008)

420 Projects



CPUE Takes per Project by Subregion

(1995-2008)



Hopper Dredging Window

Based on Water Temp. & Nesting Timeline

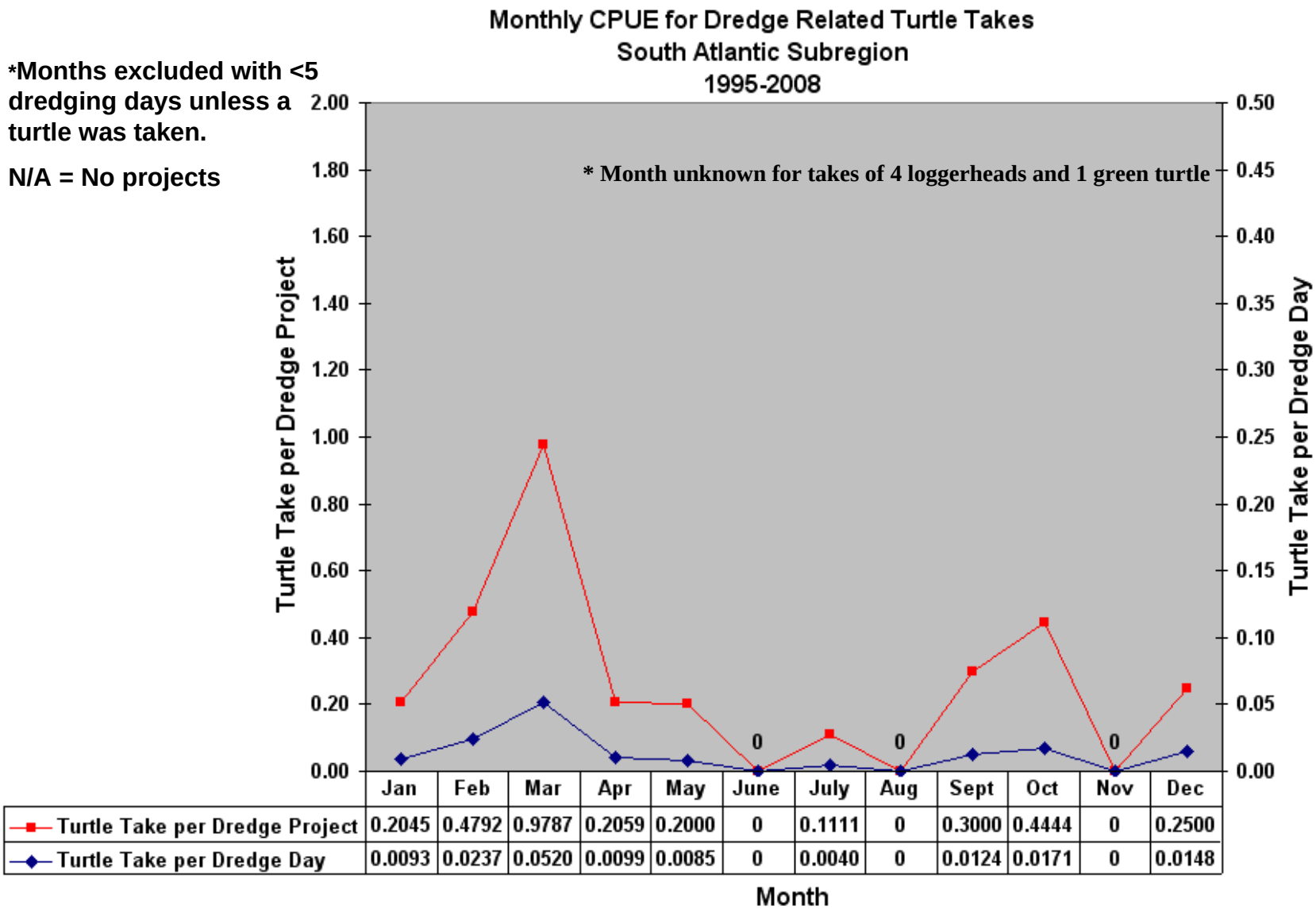
Hatching

Nesting

JAN FEB MAR APR ***MAY JUN JUL AUG SEP OCT*** *NOV DEC*

*Months excluded with <5 dredging days unless a turtle was taken.

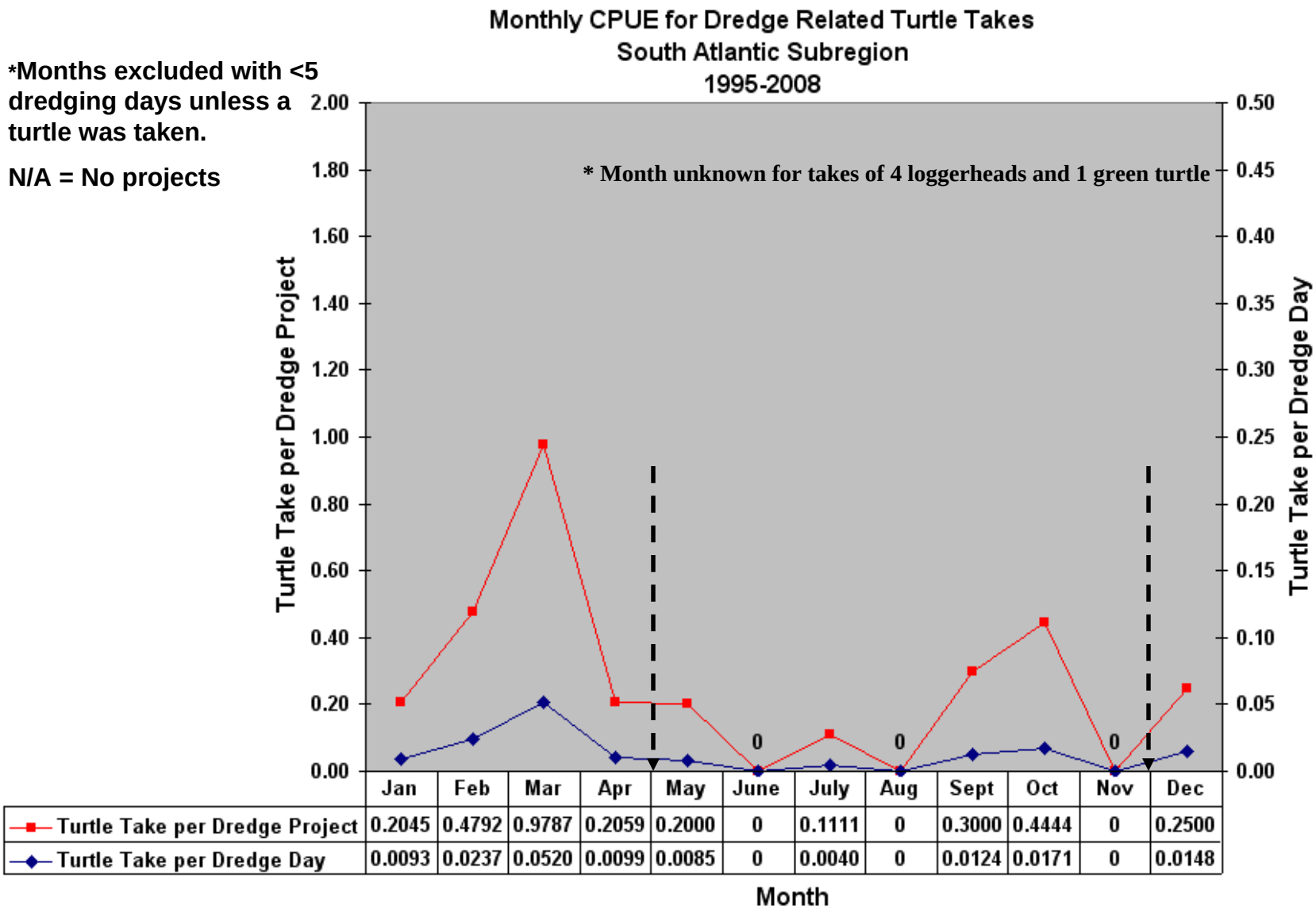
N/A = No projects



Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	9	23	46	7	4	0	1	0	3	4	0	6
Total Projects	44	48	47	34	20	11	9	11	10	9	9	24
Total Dredge Days	967	969	885	710	469	249	249	200	242	234	216	405

*Months excluded with <5 dredging days unless a turtle was taken.

N/A = No projects



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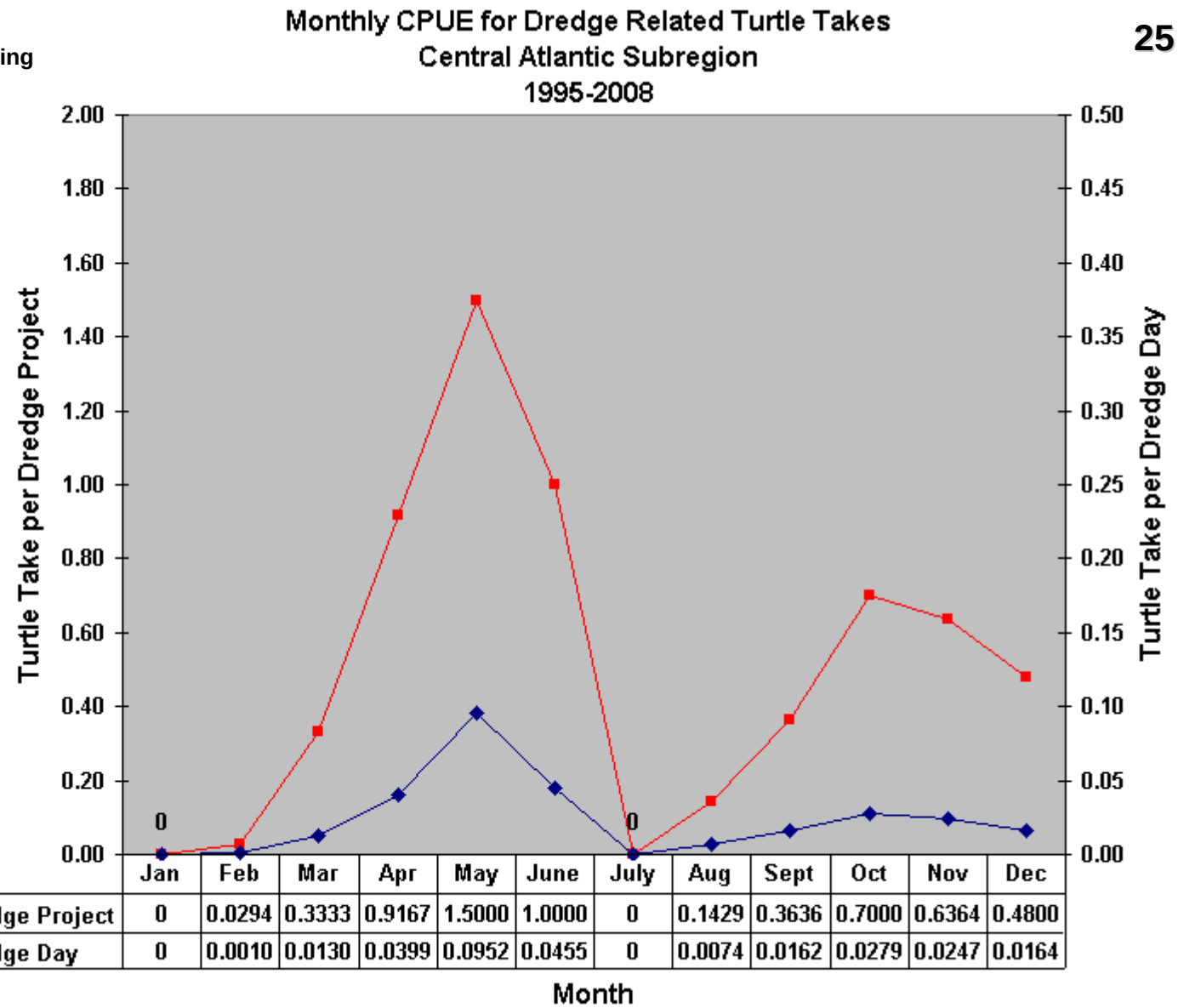

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	0	1	12	11	6	1	0	1	4	7	7	12
Total Projects	38	34	36	12	4	1	4	7	11	10	11	25
Total Dredge Days	971	1000	926	276	63	22	63	136	247	251	283	730

*Months excluded with <5 dredging days unless a turtle was taken.

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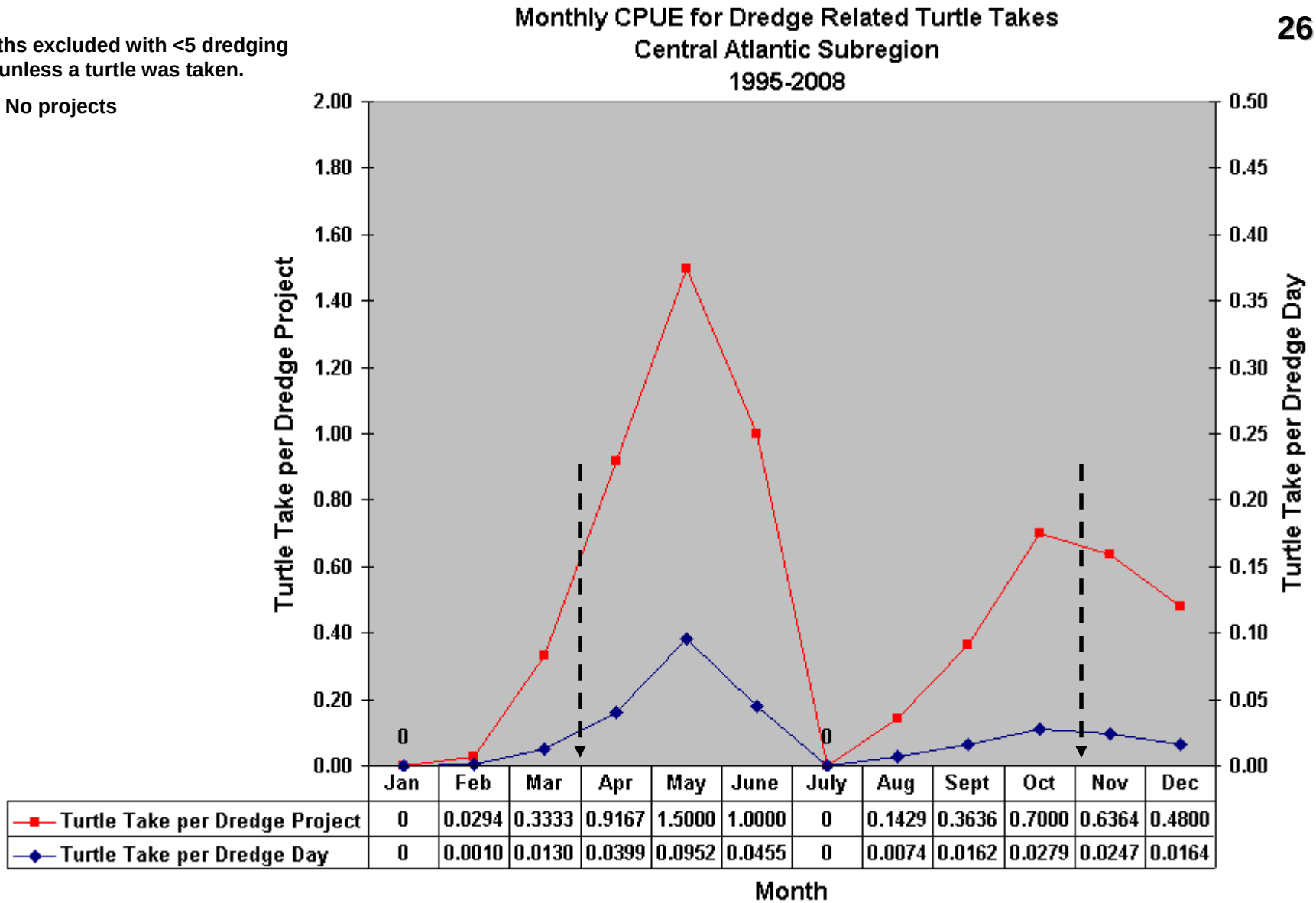

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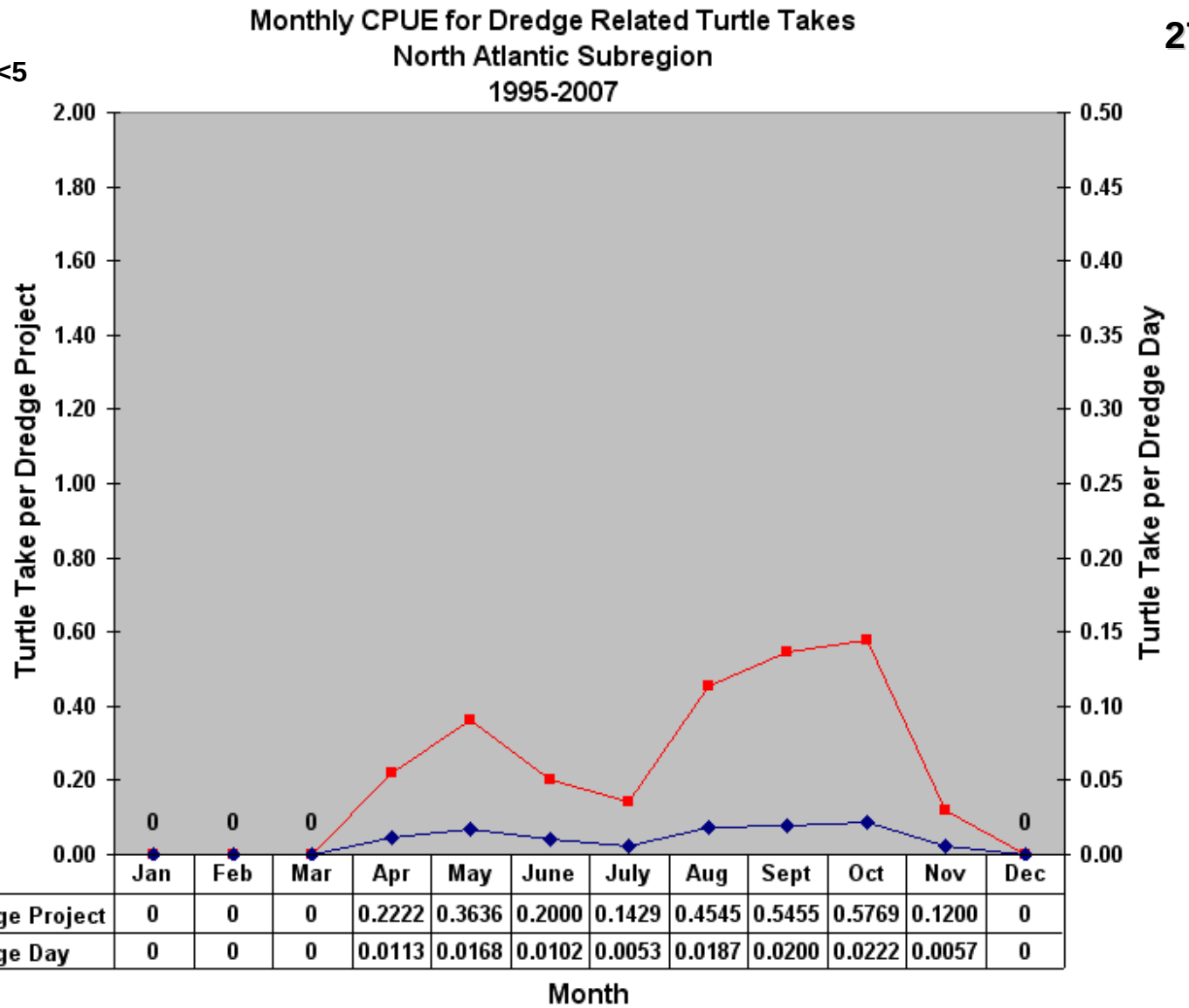

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Turtle Take per Dredge Project	0	0	0	0.2222	0.3636	0.2000	0.1429	0.4545	0.5455	0.5769	0.1200	0
Turtle Take per Dredge Day	0	0	0	0.0113	0.0168	0.0102	0.0053	0.0187	0.0200	0.0222	0.0057	0

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	0	0	0	2	4	4	3	10	12	15	3	0
Total Projects	9	4	6	9	11	20	21	22	22	26	25	9
Total Dredge Days	198	102	154	177	238	394	568	534	601	676	525	249

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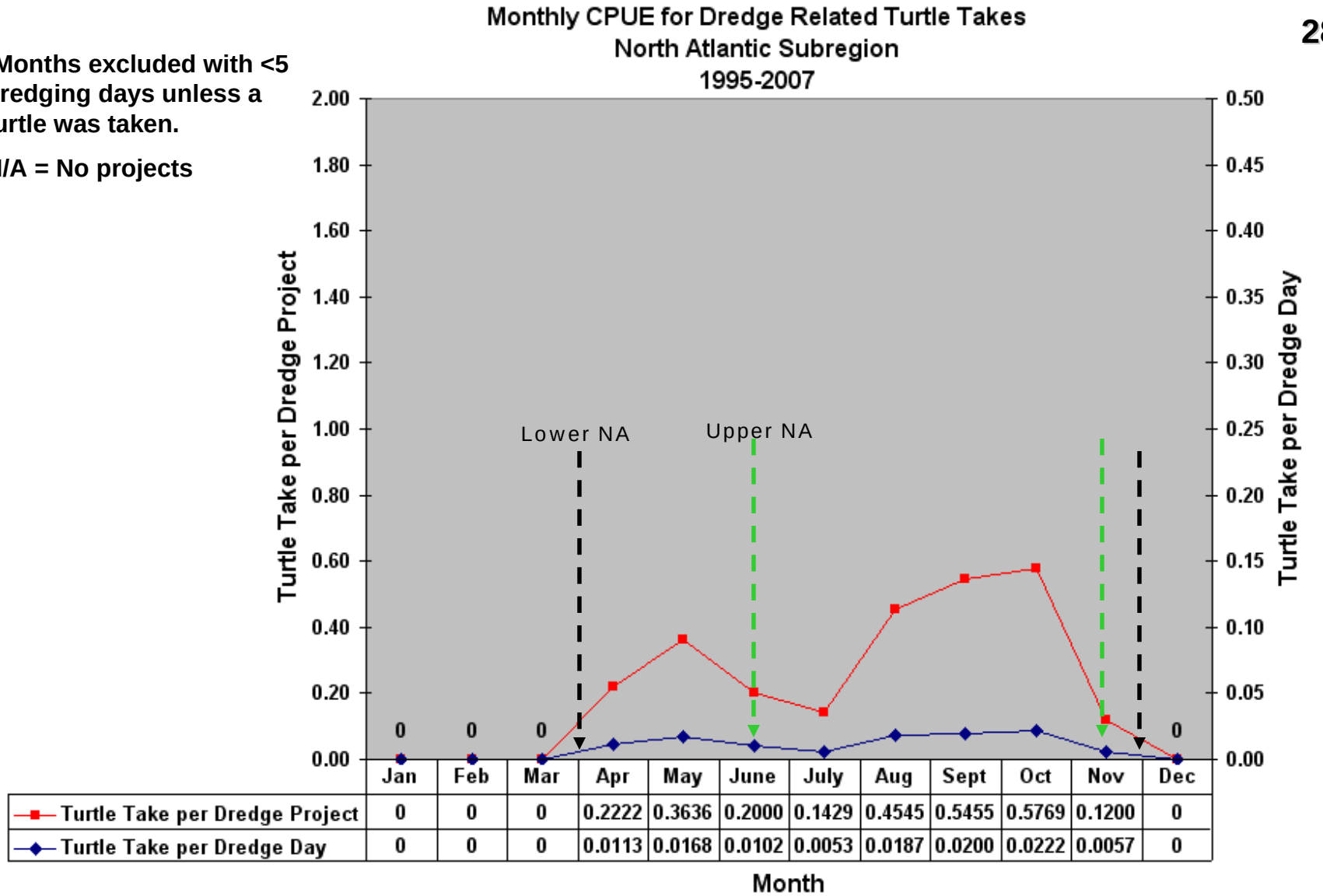

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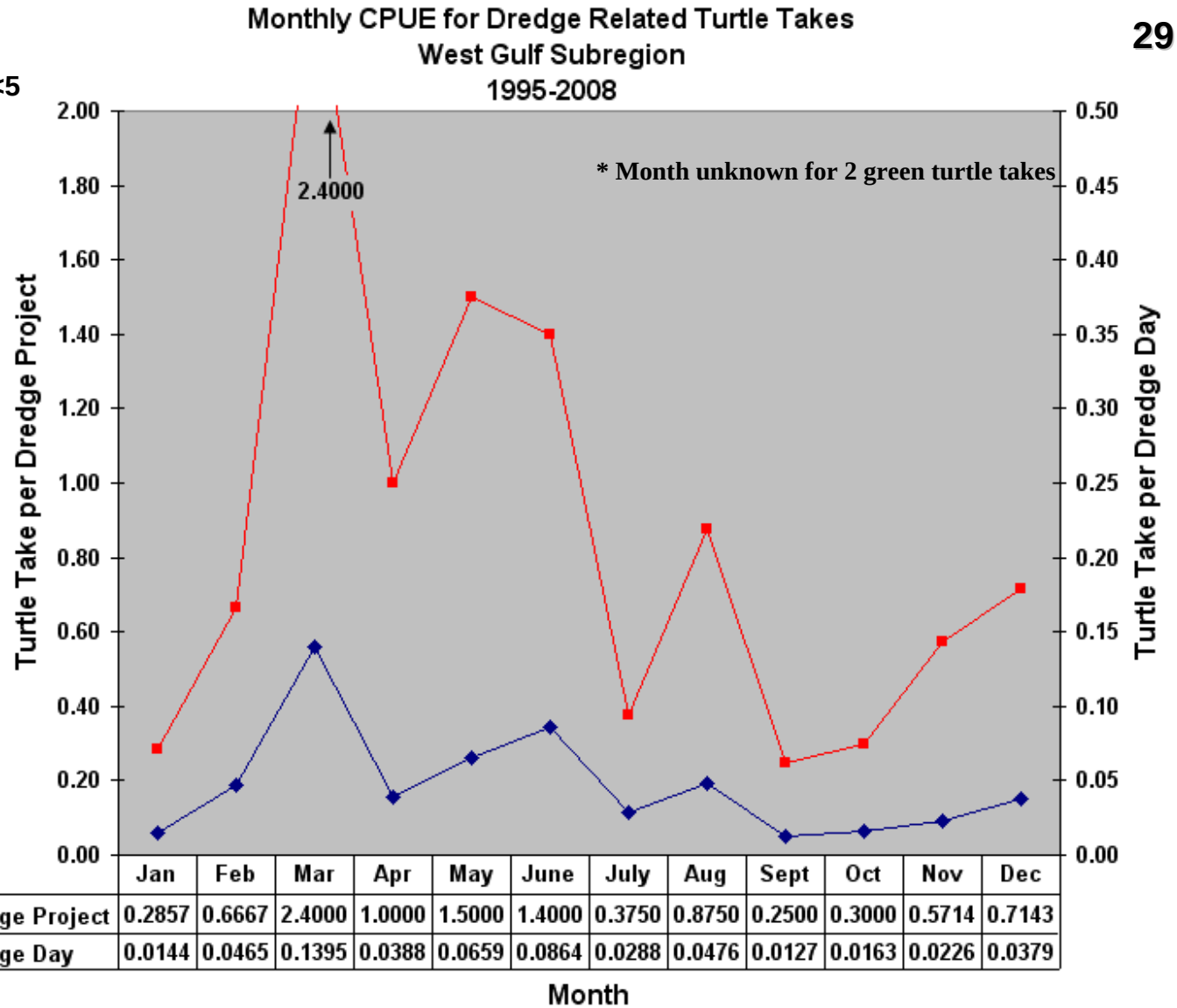

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Turtle Take per Dredge Project	0.2857	0.6667	2.4000	1.0000	1.5000	1.4000	0.3750	0.8750	0.2500	0.3000	0.5714	0.7143
Turtle Take per Dredge Day	0.0144	0.0465	0.1395	0.0388	0.0659	0.0864	0.0288	0.0476	0.0127	0.0163	0.0226	0.0379

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	2	6	12	4	6	7	3	7	1	3	4	5
Total Projects	7	9	5	4	4	5	8	8	4	10	7	7
Total Dredge Days	139	129	86	103	91	81	104	147	79	184	177	132

*Months excluded with <5 dredging days unless a turtle was taken.

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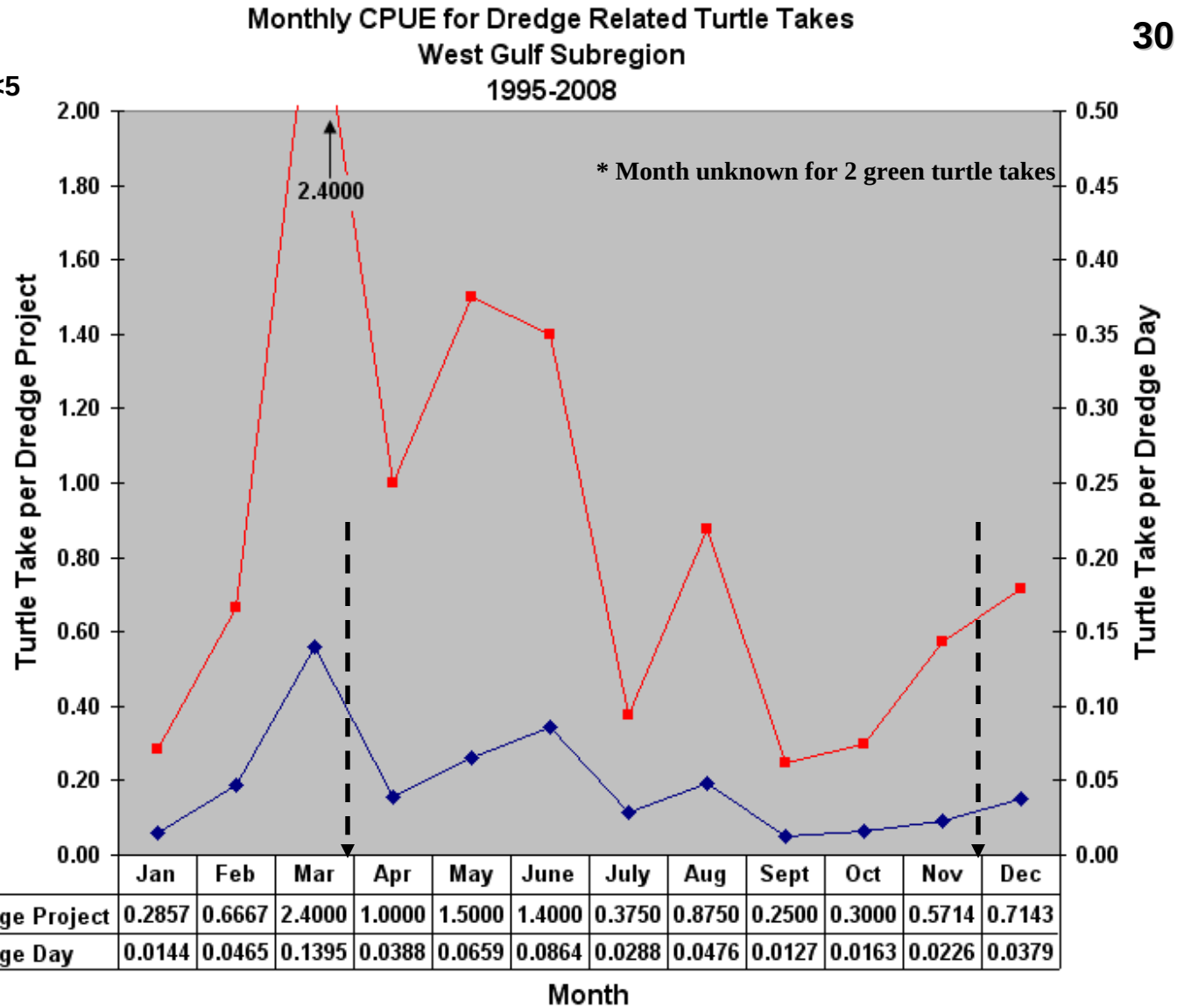

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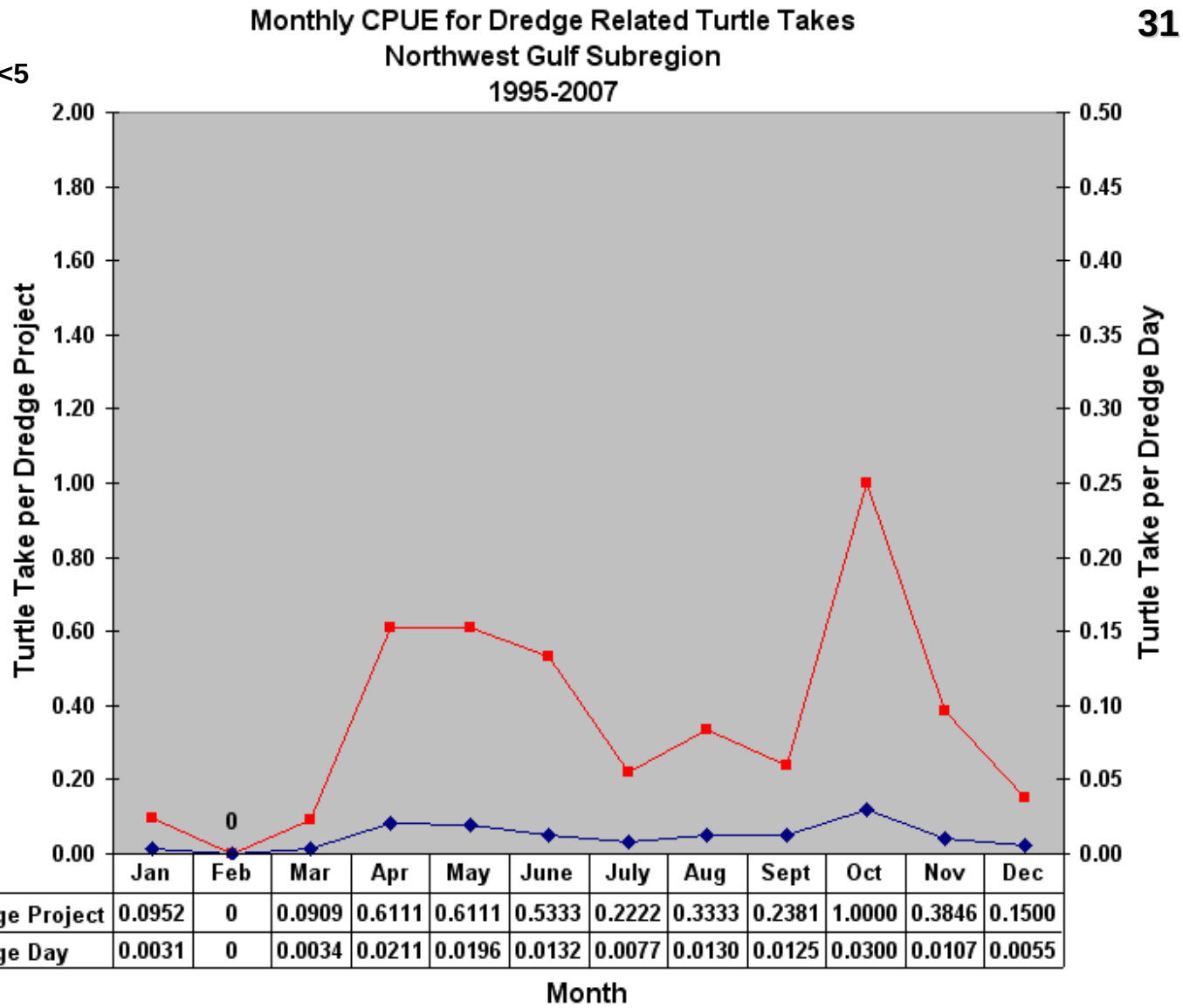

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Turtle Take per Dredge Project	0.0952	0	0.0909	0.6111	0.6111	0.5333	0.2222	0.3333	0.2381	1.0000	0.3846	0.1500
Turtle Take per Dredge Day	0.0031	0	0.0034	0.0211	0.0196	0.0132	0.0077	0.0130	0.0125	0.0300	0.0107	0.0055

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	2	0	2	11	11	8	4	7	5	13	5	3
Total Projects	21	21	22	18	18	15	18	21	21	13	13	20
Total Dredge Days	641	585	592	522	560	607	521	537	399	434	466	541

*Months excluded with <5 dredging days unless a turtle was taken.

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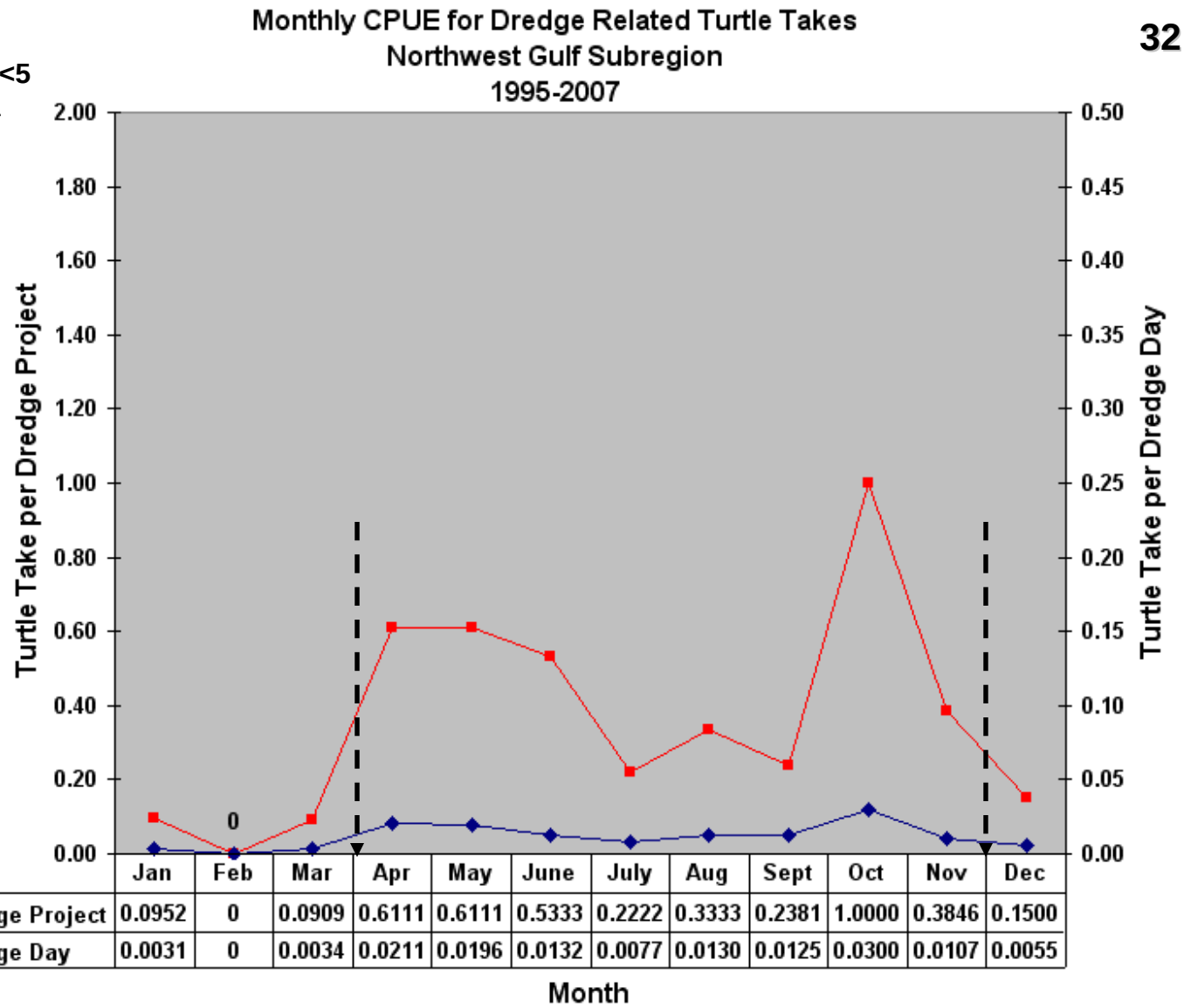

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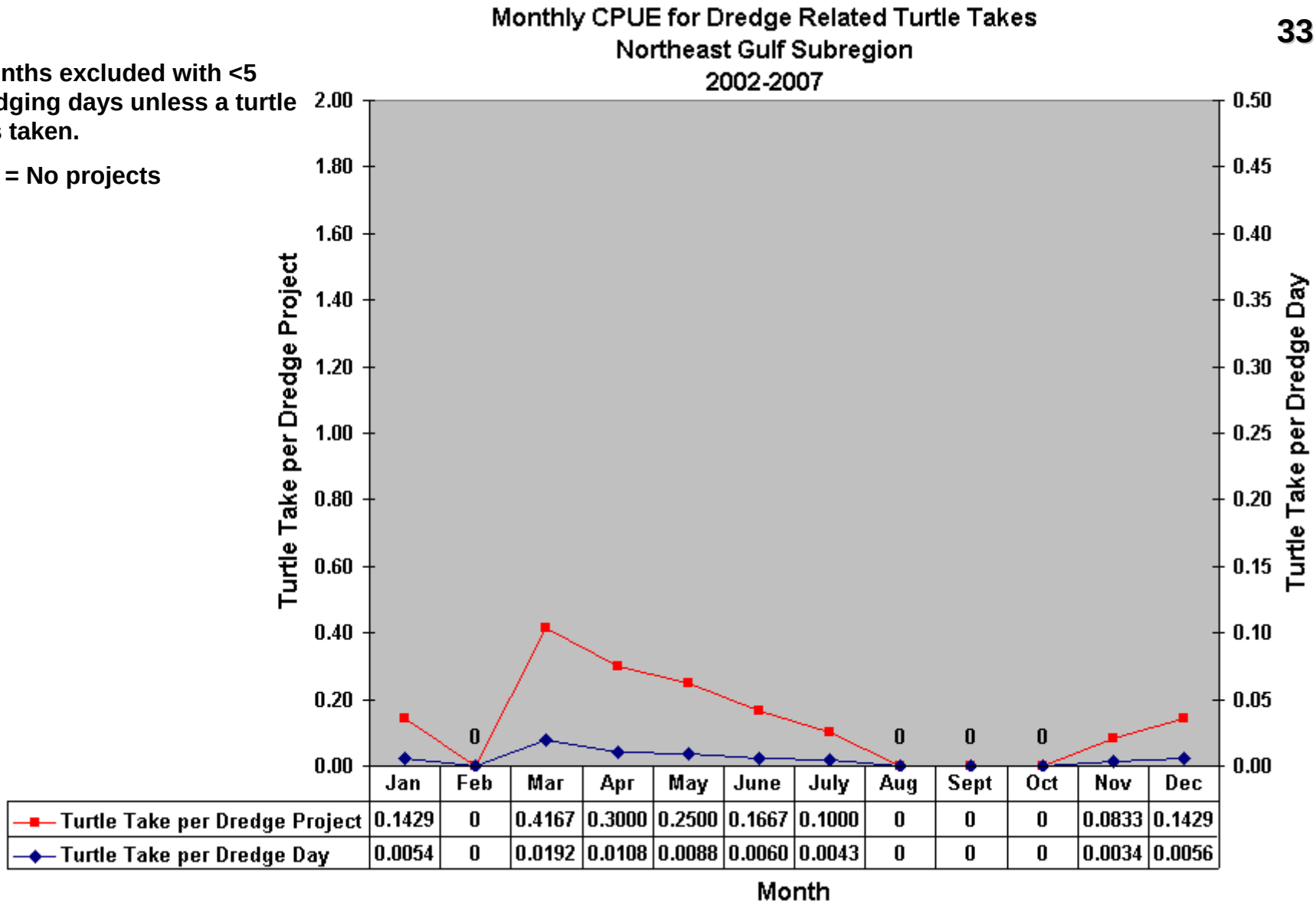
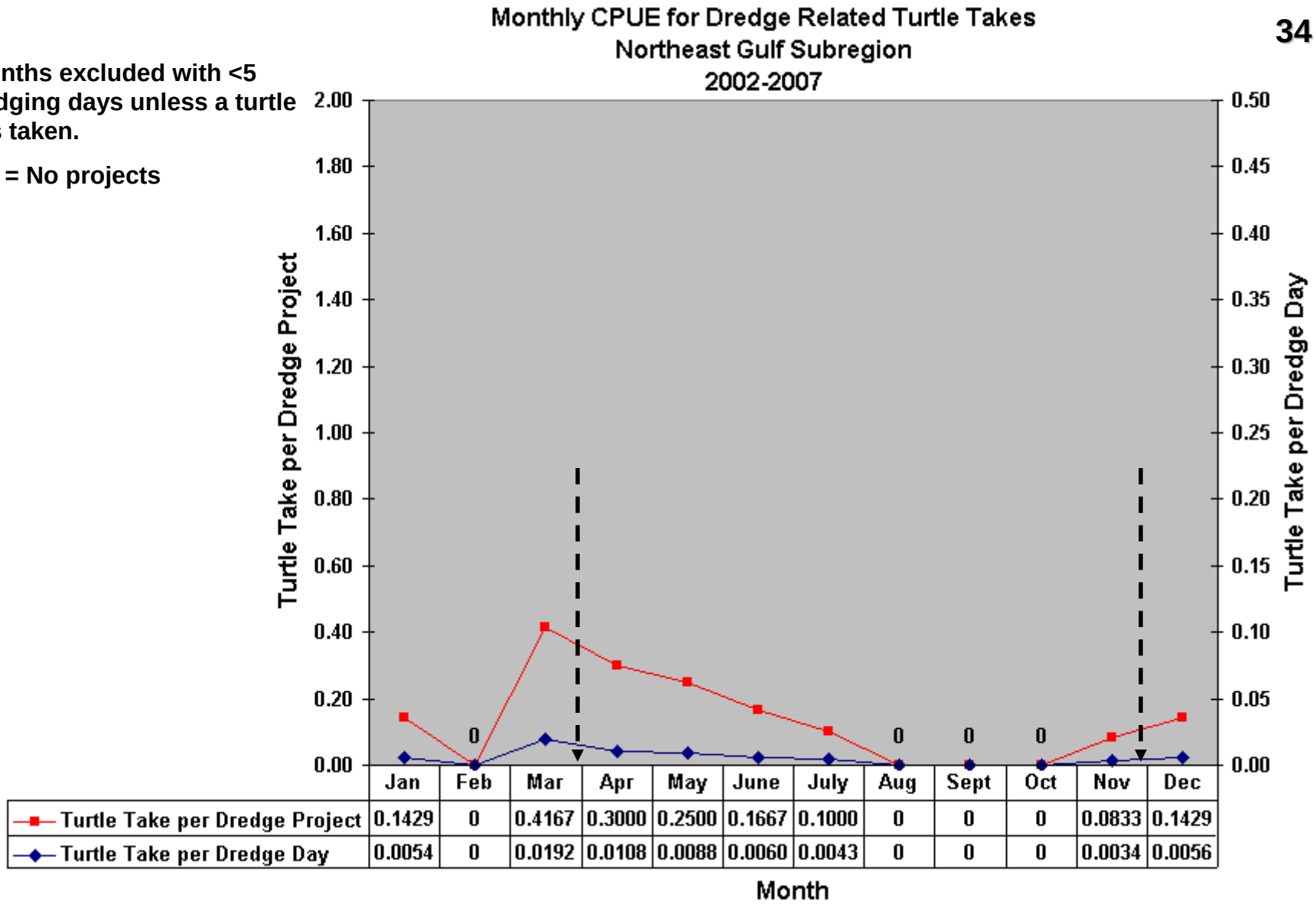


Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	1	0	5	3	3	2	1	0	0	0	1	1
Total Projects	7	9	12	10	12	12	10	8	8	14	12	7
Total Dredge Days	186	170	260	278	339	332	232	166	212	363	296	179

*Months excluded with <5 dredging days unless a turtle was taken.

N/A = No projects



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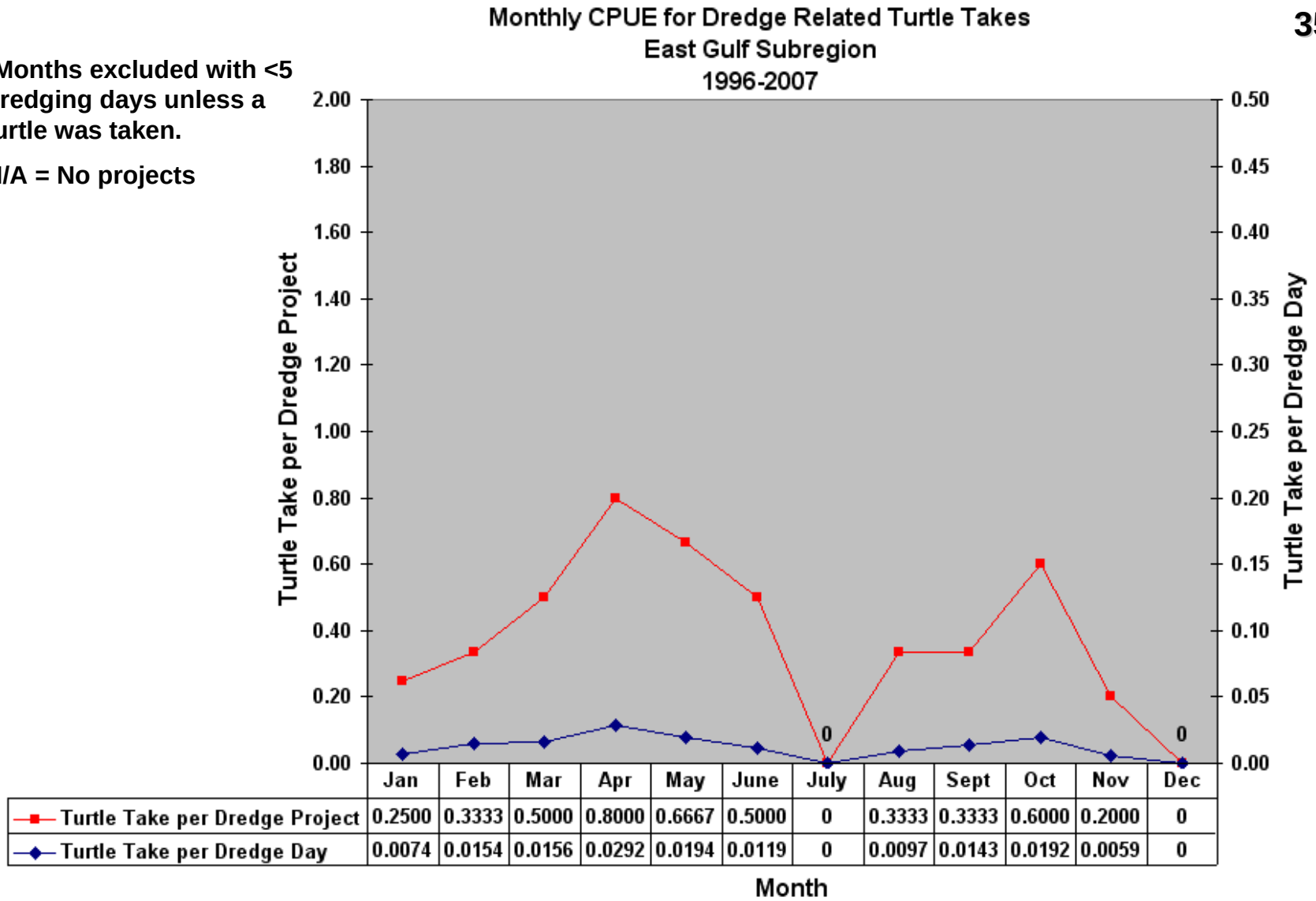

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	1	1	2	4	2	1	0	1	1	3	1	0
Total Projects	4	3	4	5	3	2	2	3	3	5	5	4
Total Dredge Days	136	65	128	137	103	84	67	103	70	156	169	145

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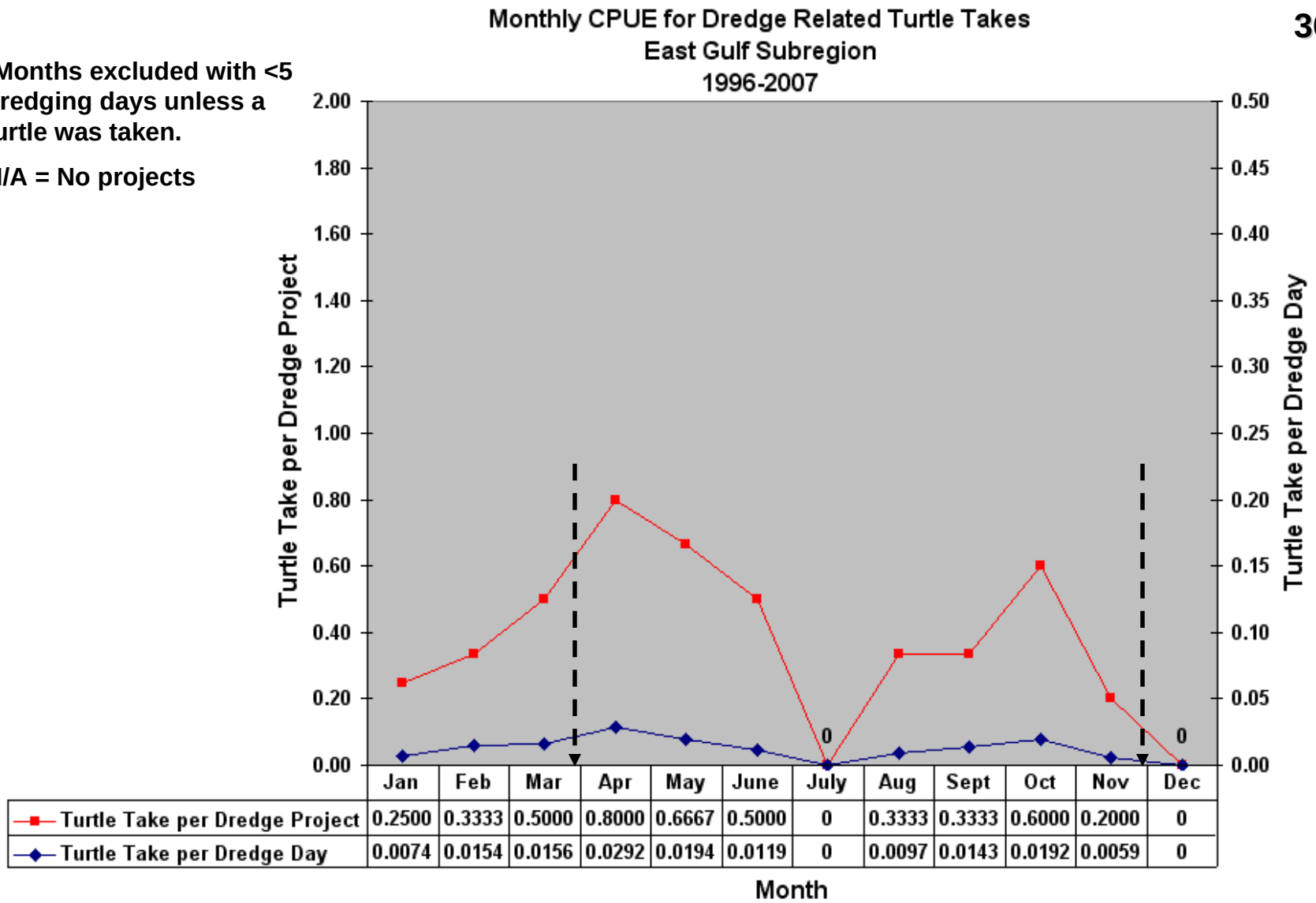
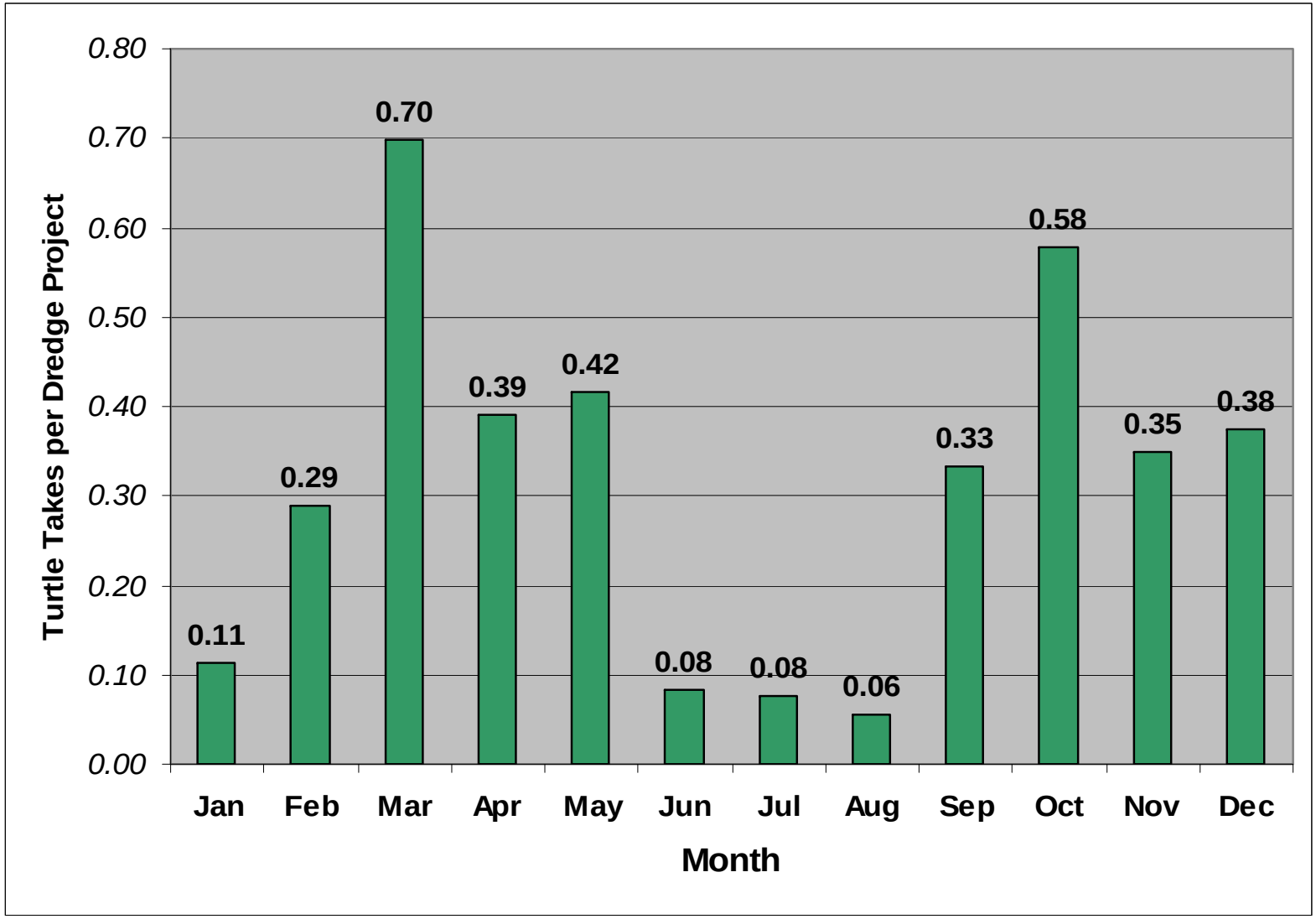
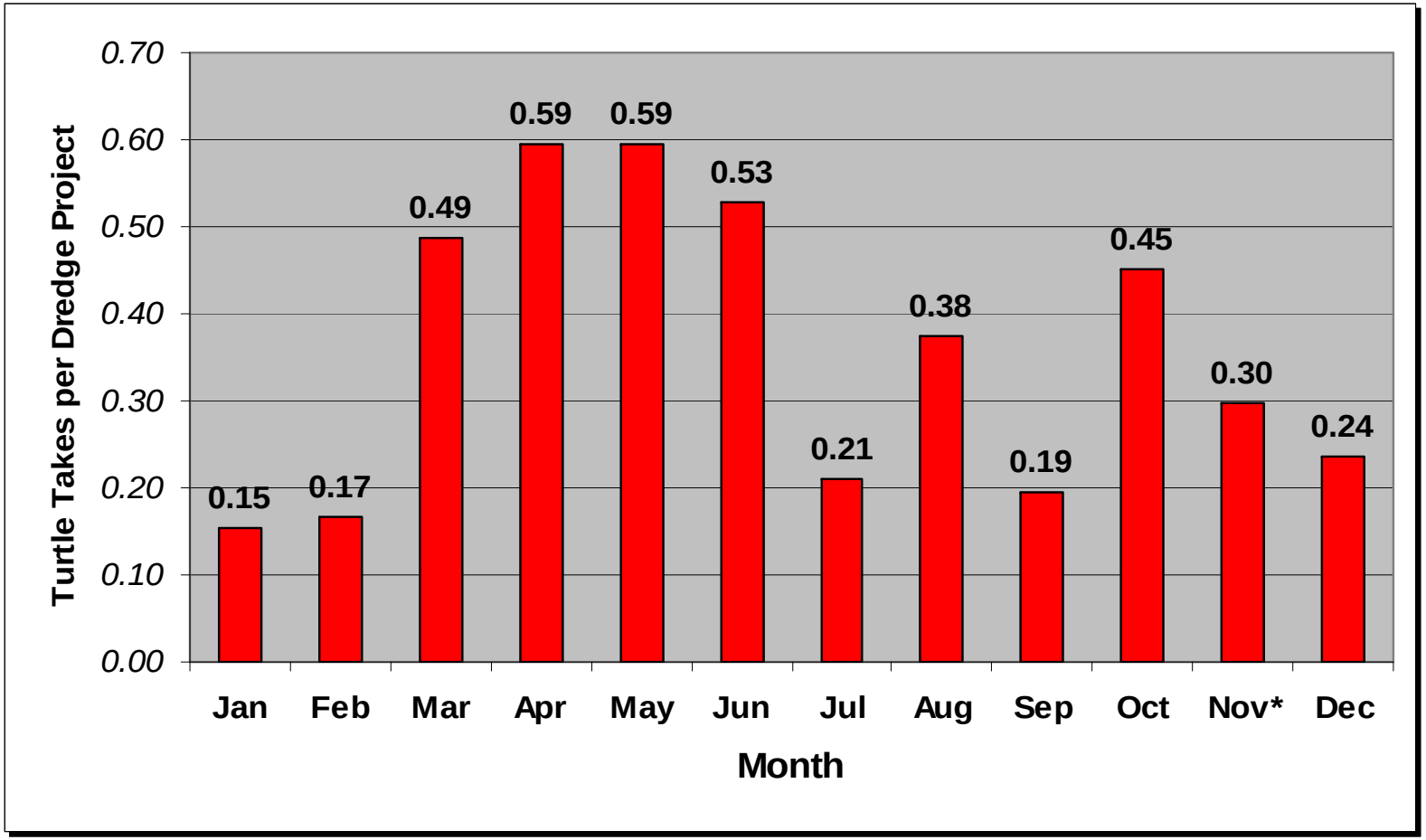


Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Total Turtle Takes	1	1	2	4	2	1	0	1	1	3	1	0
Total Projects	4	3	4	5	3	2	2	3	3	5	5	4
Total Dredge Days	136	65	128	137	103	84	67	103	70	156	169	145

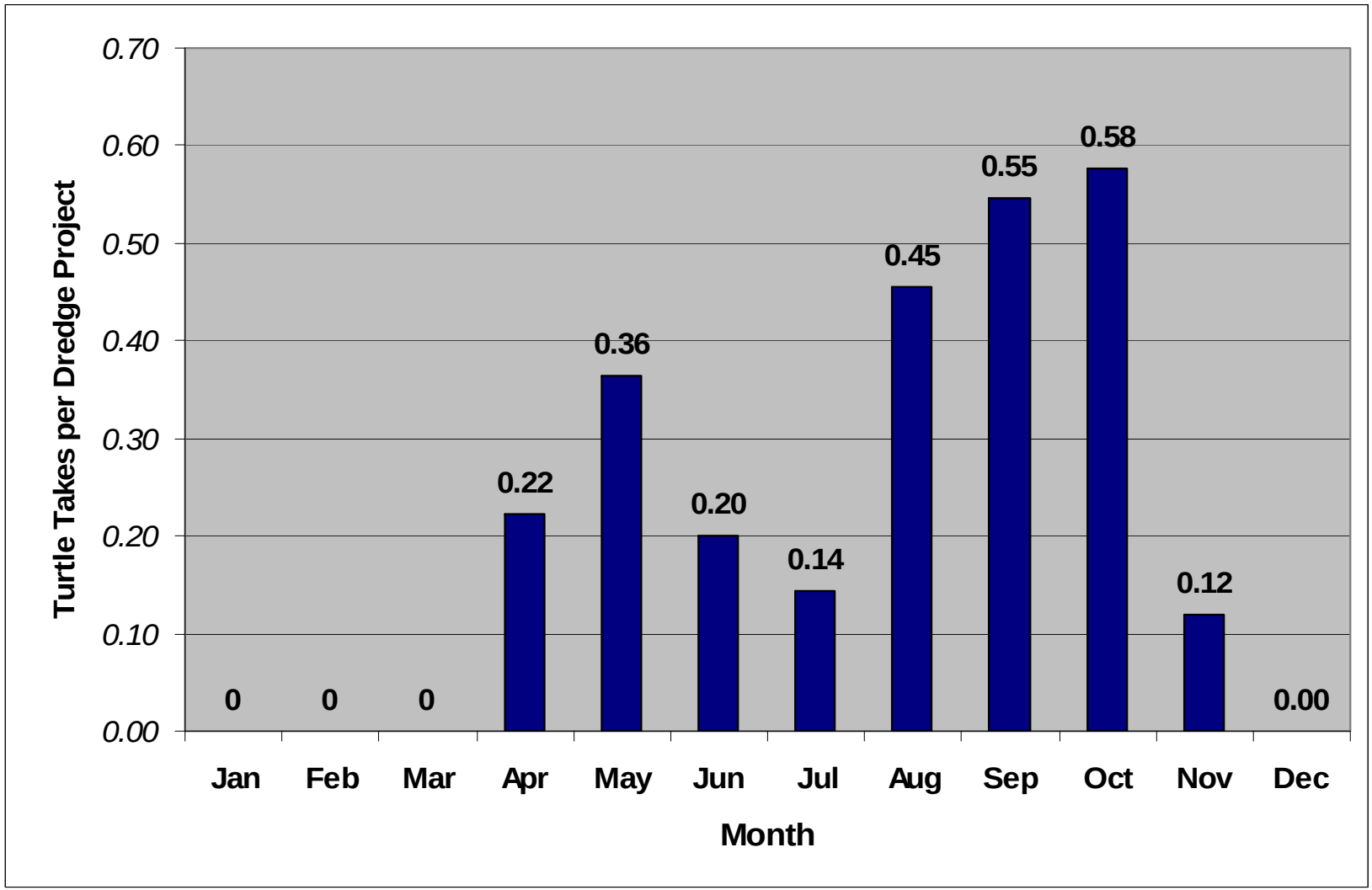
Monthly CPUE
South/Central Atlantic



Monthly CPUE
Gulf



Monthly CPUE
North Atlantic

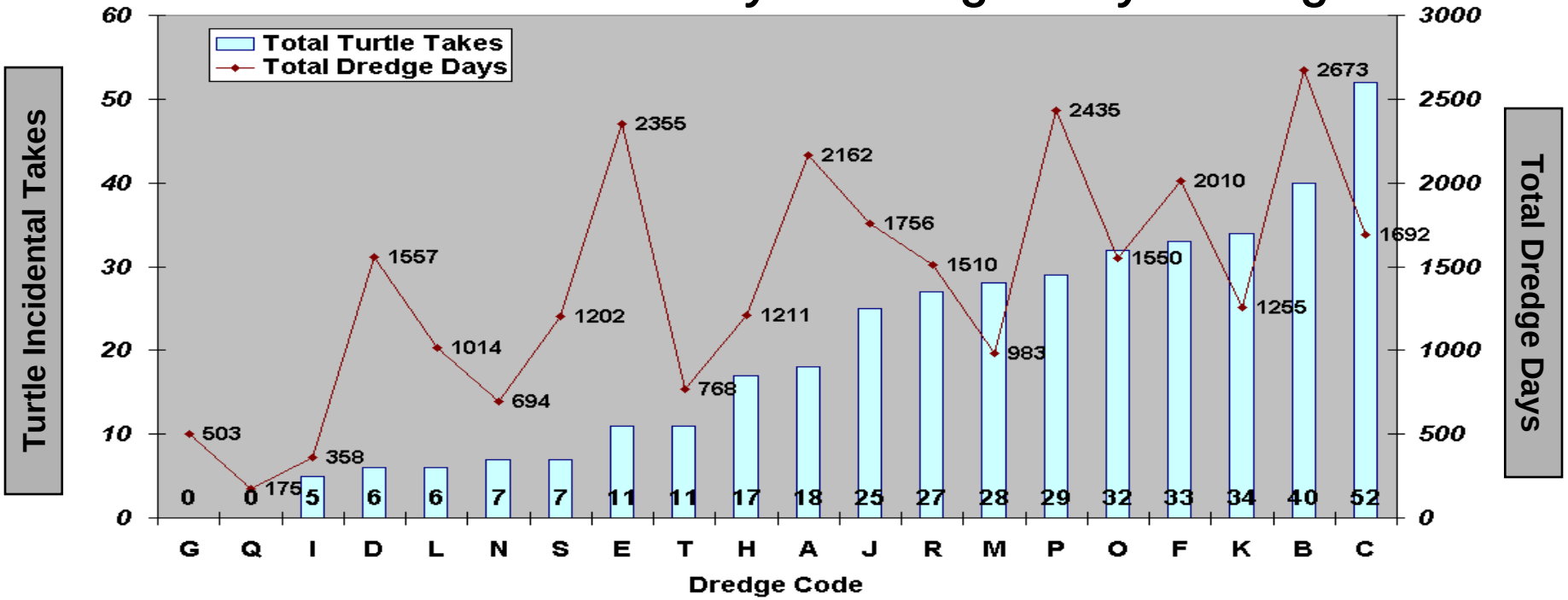


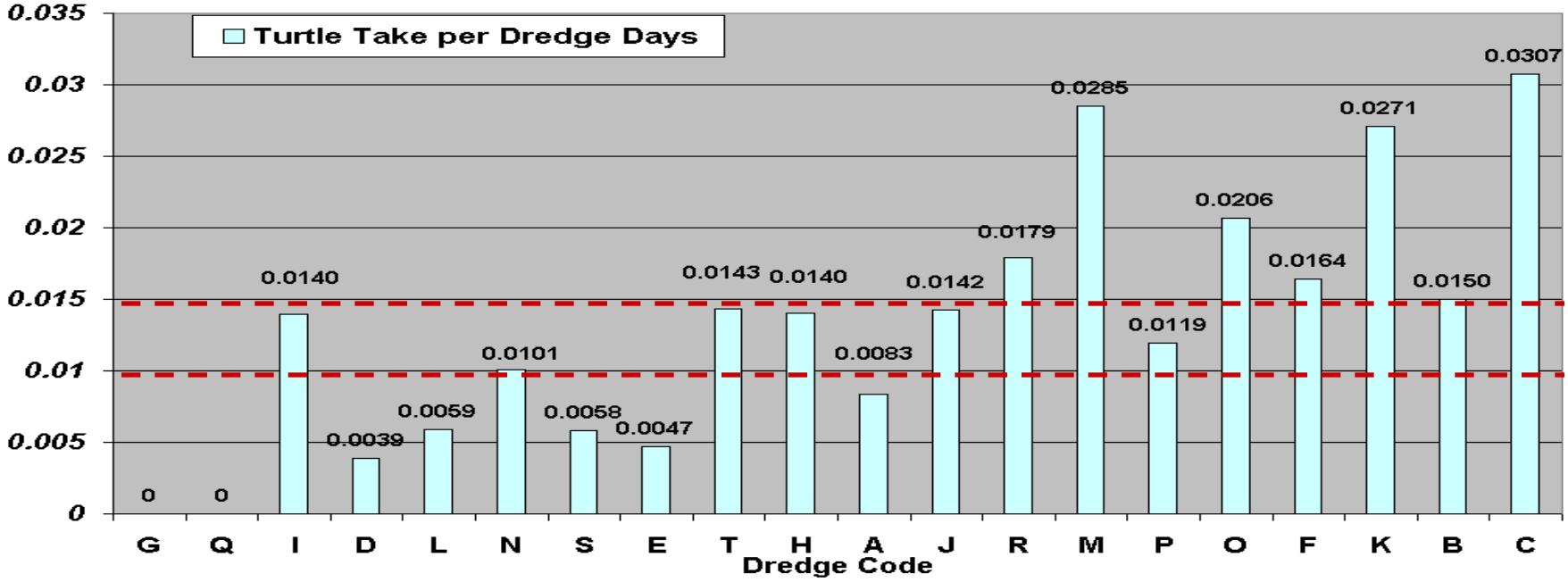
CPUE
Takes/Project Risk Assessment
BY *SUBREGIONS*

TURTLE TAKES (1995 - 2008)	HABITAT SUBREGIONS							TOTAL	
	SA	CA	WG	NWG	NEG	EG	NA	14 Yrs	Annual Average
ACTUAL	103	64	67	71	18	18	53	**394	28
IF REDUCE HIGH CPUE MONTHS TO 0.5 Takes/Proj.	81	46	37	48	18	16	50	296	21
TURTLE DIFFERENCE	22	18	30	23	0	2	3	98	7

** 7 takes with unknown month data

Total Takes and Days Dredged by Dredge





Lessons Learned

- Use species/habitat boundaries NOT project/agency boundaries for:
  - *Database management*
  - *Pooling data and other resources*
  - *Analyses of incidental take and biological data*
  - *Identifying alternative protection tools*
  - *Identify trends only seen through "The Big Picture"*
  - *Influencing regulations and restrictions*
  - *Refining environmental windows*

Application of Lessons Learned

- FY09 - Summer Dredging
  - Kings Bay, Brunswick, and Savannah, GA
  - To demonstrate:
    - Alternative/refined windows
    - Alternative trawl technique
    - Turtle “friendly” bed-leveler

Benefits of Lessons Learned

- *REDUCE turtle takes*
- *REDUCE dredging costs*
- *INCREASE environmental conservation*
- *INCREASE flexibility in dredge schedules*