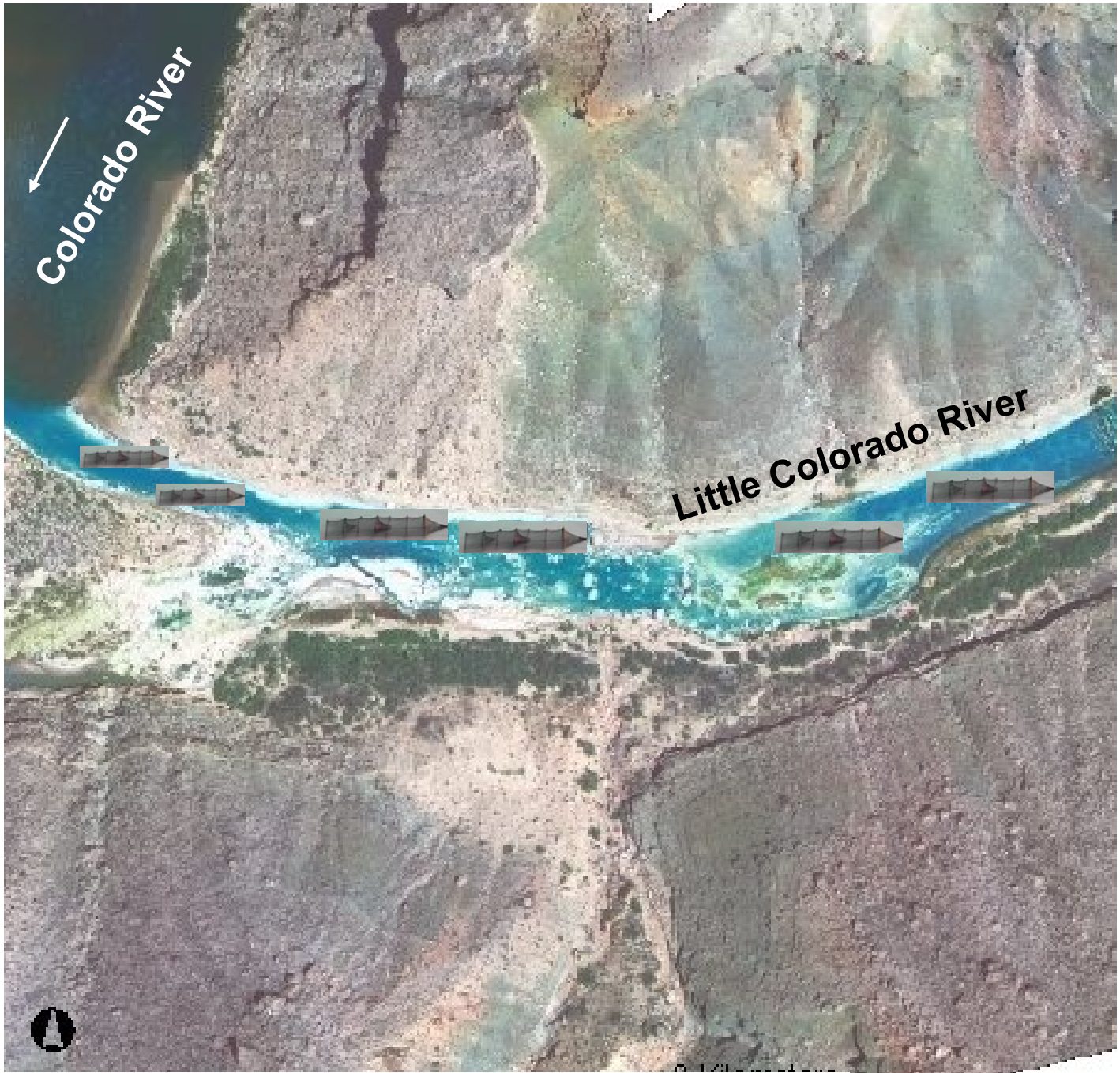
Monitoring of Native and Nonnative Fishes in the Little Colorado River in Grand Canyon 1987 - 2005

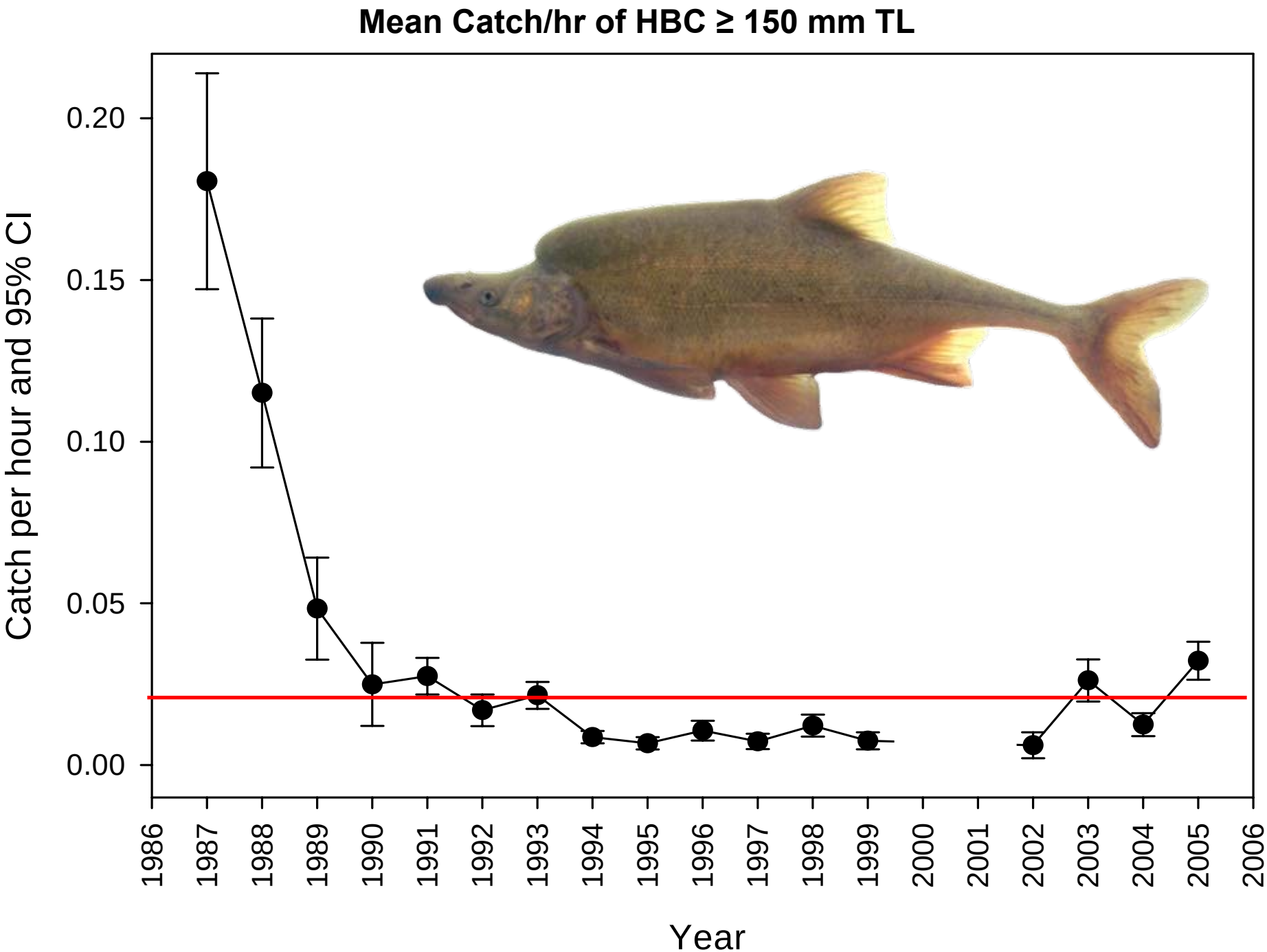
David Ward
Bill Persons
Arizona Game and Fish Department
Research Branch

Grand Canyon Monitoring and Research Center (WWW.GCMRC.GOV)

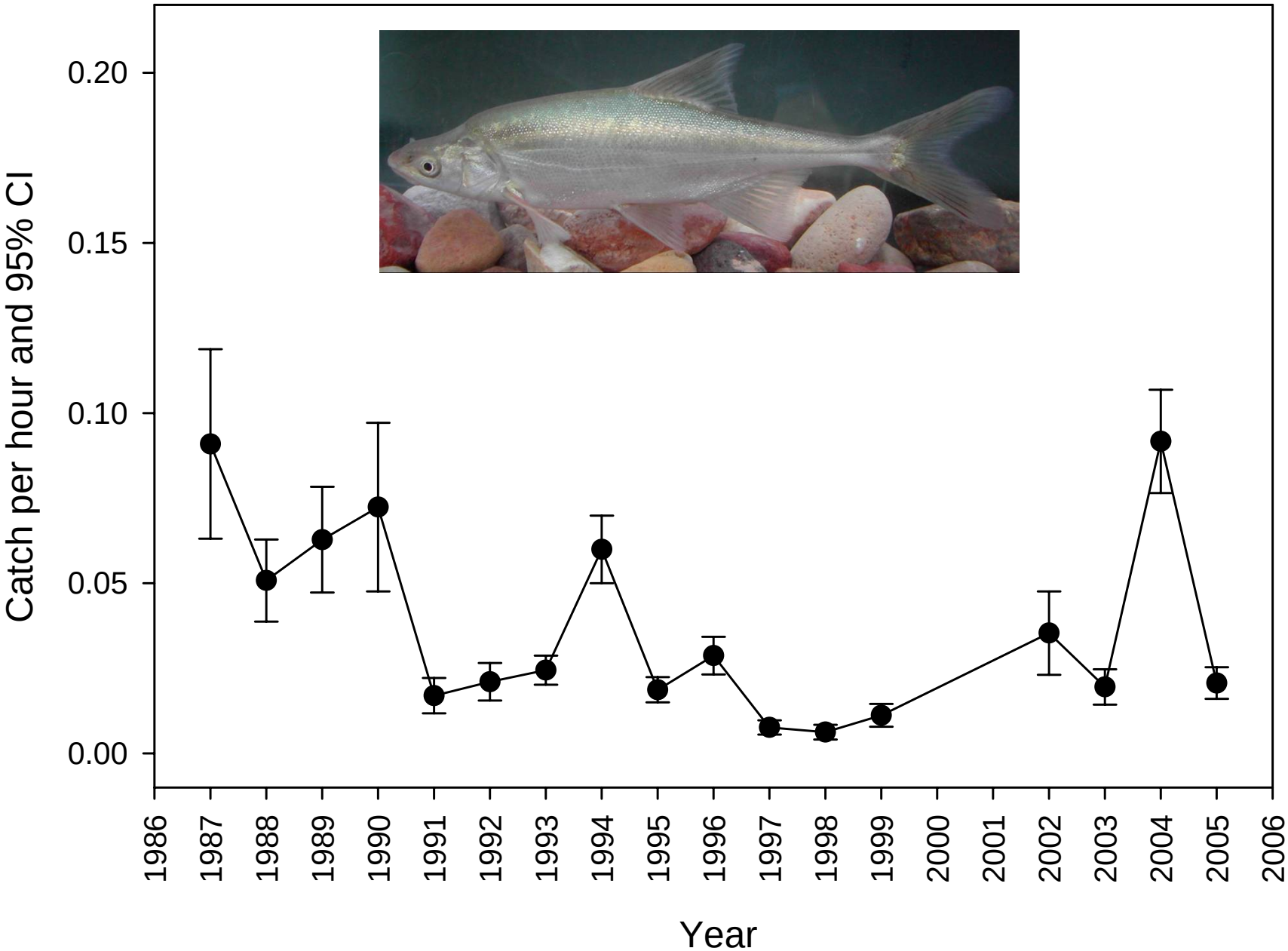


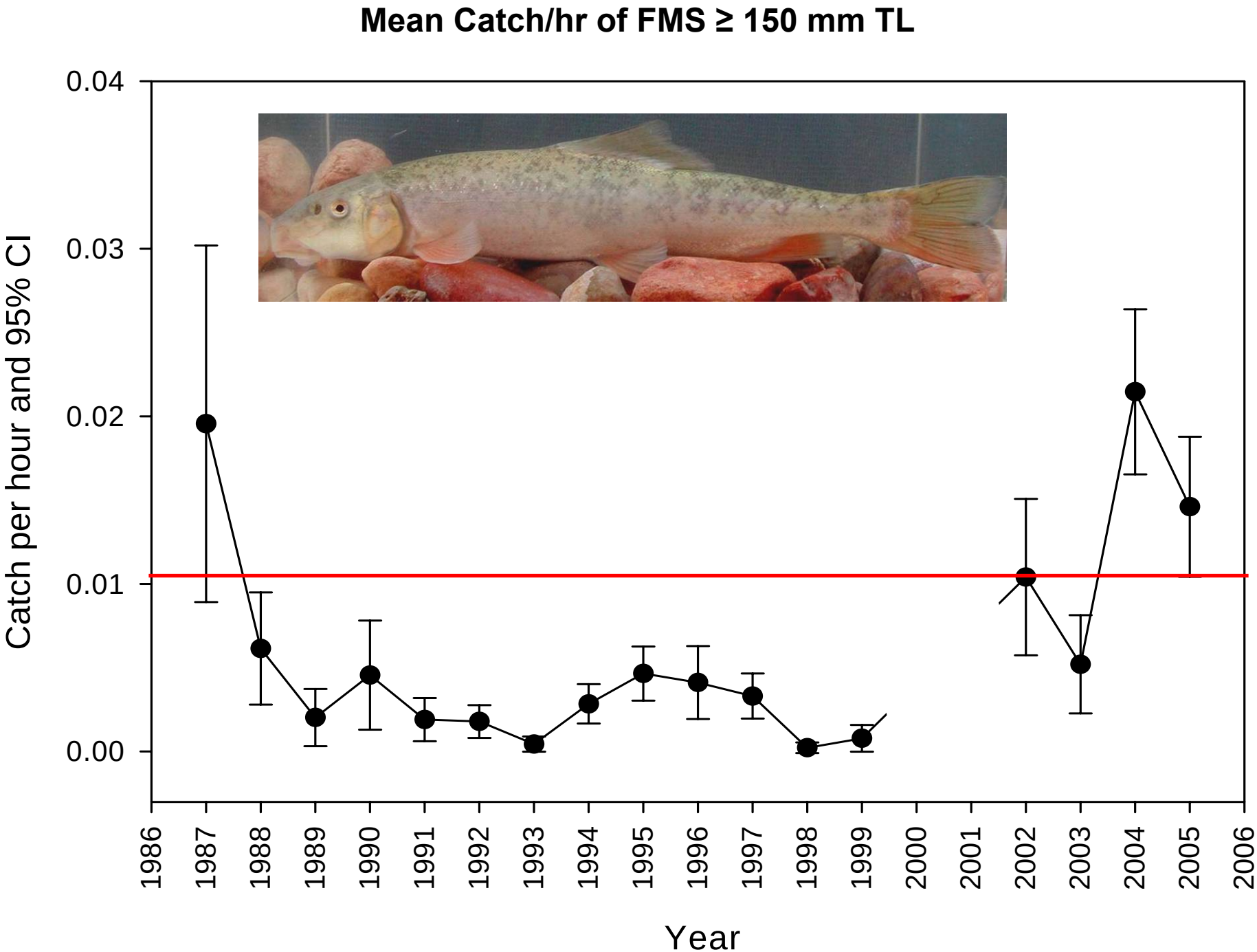
Grand Canyon Monitoring and Research Center (WWW.GCMRC.GOV)

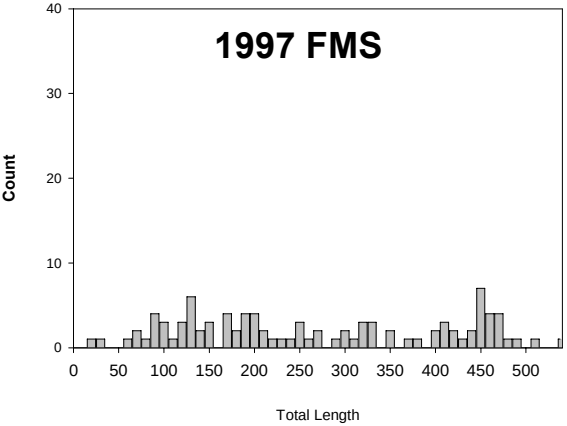
Year	Start	End	Trip ID	Days	# of fixed site nets	# of net sets per year
1987	9-May	30-May	LC19870509	21	6	124
1988	3-May	29-May	LC19880503	26	11	329
1989	3-May	28-May	LC19890503	25	10	205
1990	17-Apr	14-May	LC19900417	27	13	189
1991	3-May	30-Jun	LC19910503	58	13	535
1992	5-May	28-May	LC19920505	23	13	319
1993	30-Apr	31-May	LC19930430	31	13	744
1994	19-Apr	21-May	LC19940419	32	13	814
1995	20-Apr	20-May	LC19950420	30	13	787
1996	18-Apr	18-May	LC19960418	30	13	750
1997	13-Apr	14-May	LC19970413	31	13	753
1998	5-Apr	26-Apr	LC19980405	21	13	431
1999	7-Apr	1-May	GC19990406	24	13	497
2002	19-Apr	19-May	LC20020419	30	13	130
2003	11-Apr	9-May	LC20030411	28	13	138
2004	9-Apr	3-May	LC20040409	24	13	299
2005	8-Apr	26-May	LC20050408	26	13	269

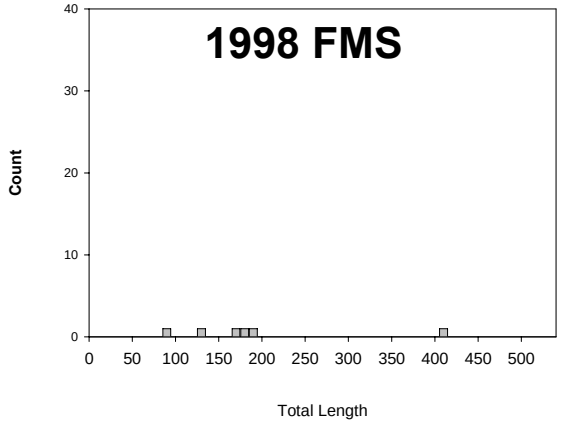

Mean Catch/hr of HBC ≥ 150 mm TL
Catch per hour and 95% CI
0.20
0.15
0.10
0.05
0.00
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year

CPUE of HBC <150 mm TL in LCR




Mean Catch/hr of FMS ≥ 150 mm TL
Catch per hour and 95% CI
0.04
0.03
0.02
0.01
0.00
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year


1997 FMS
Count
Total Length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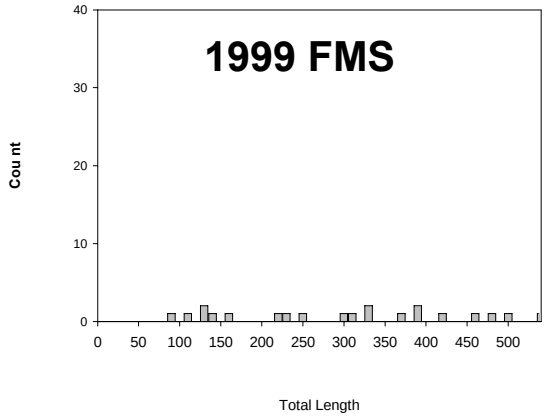
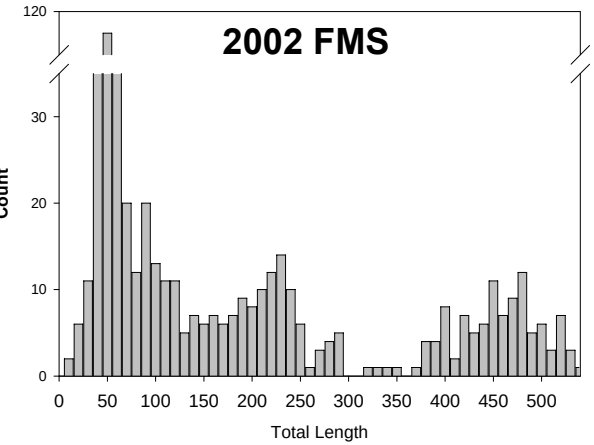
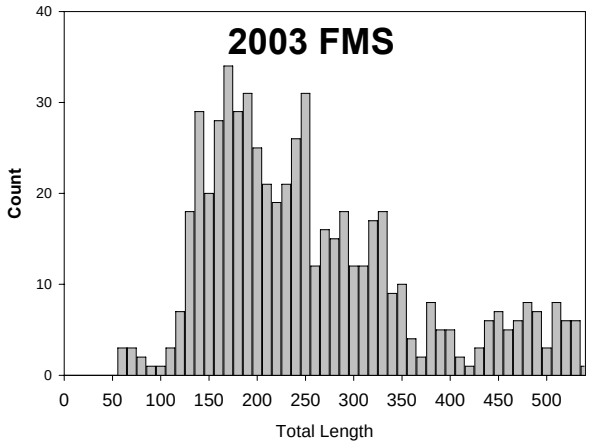
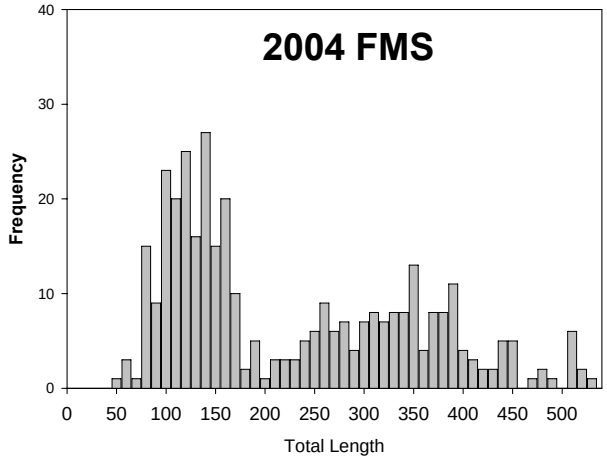
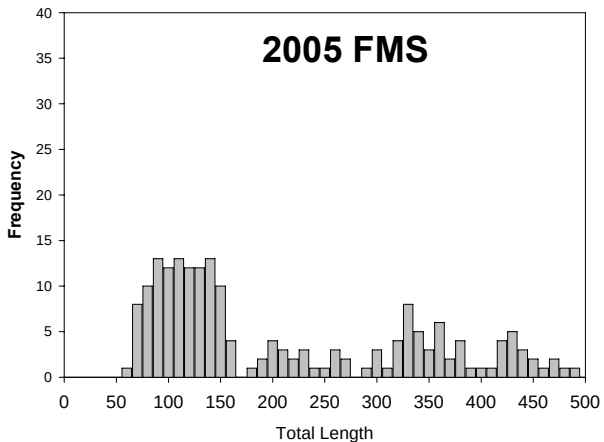
Count
Total Length

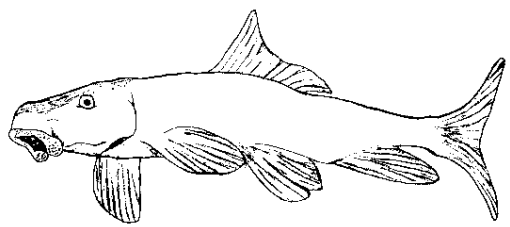

1999 FMS
Cou nt
Total Length

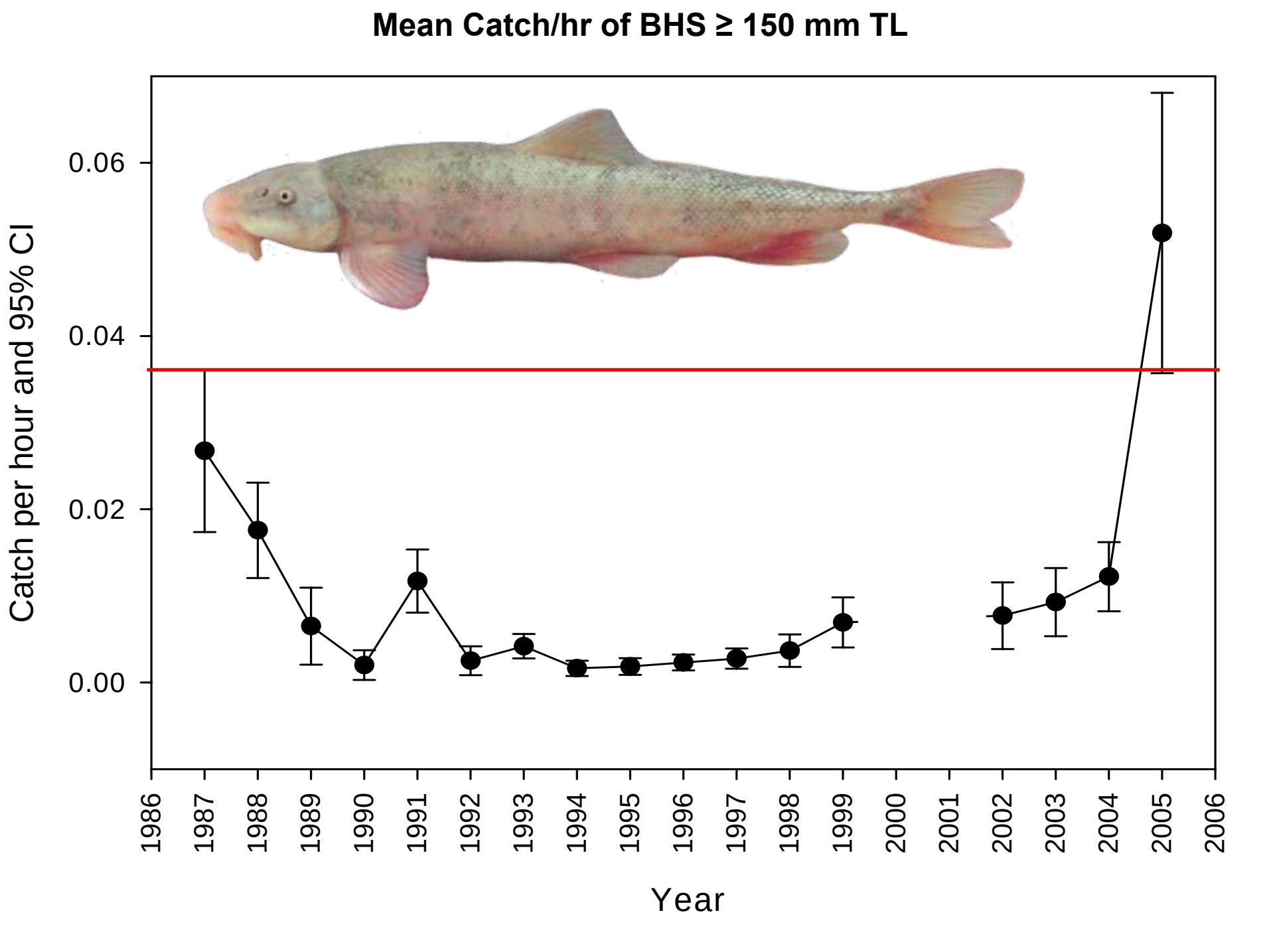

2002 FMS
Count
Total Length

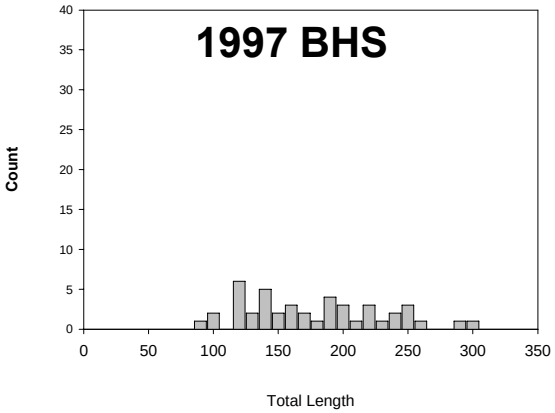

2003 FMS
Count
Total Length

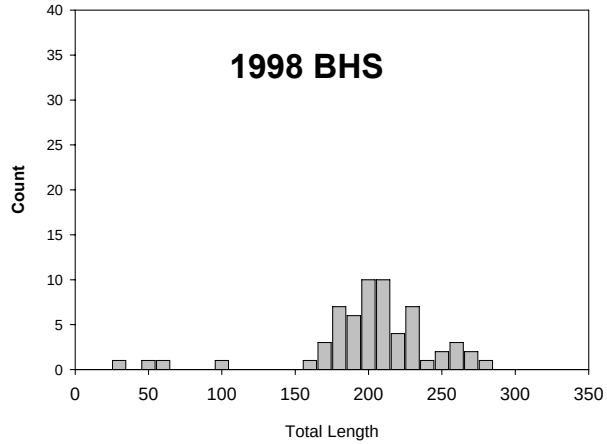

2004 FMS
Frequency
Total Length

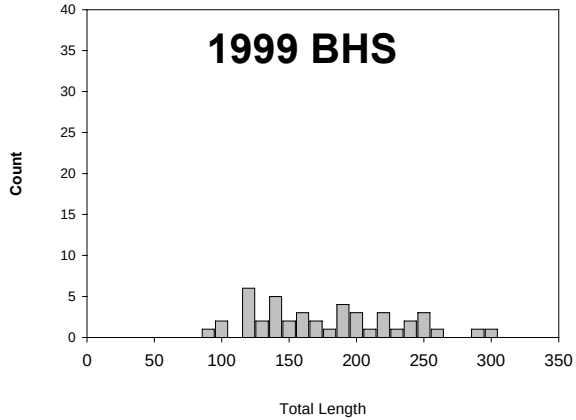

2005 FMS
Frequency
Total Length

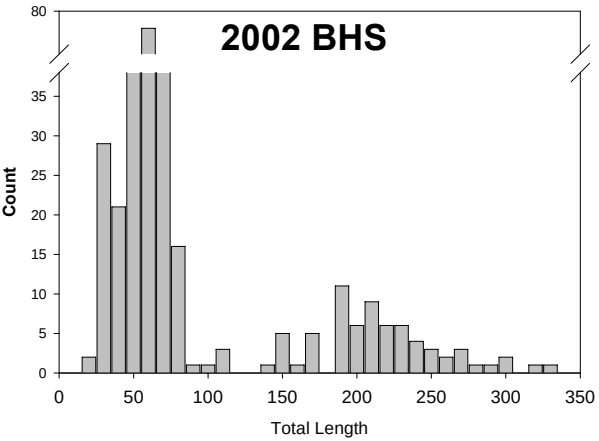


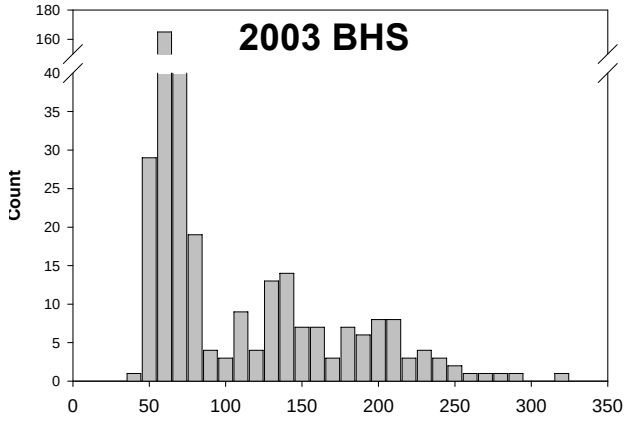

Mean Catch/hr of BHS ≥ 150 mm TL
Catch per hour and 95% CI
0.06
0.04
0.02
0.00
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Year

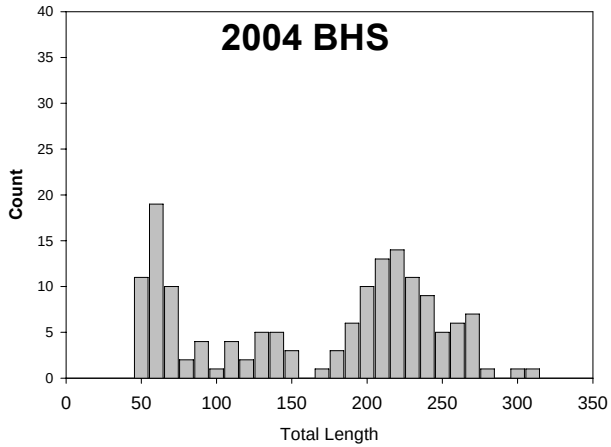

1997 BHS
Count
Total Length

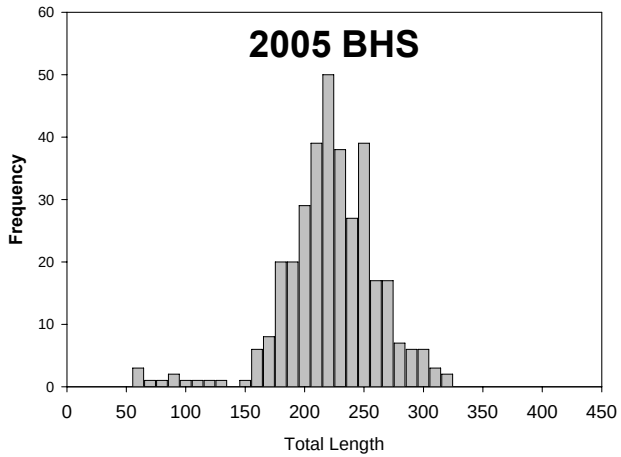

1998 BHS
Count
Total Length


1999 BHS
Count
Total Length


2002 BHS
Count
Total Length


2003 BHS
Count


2004 BHS
Count
Total Length


2005 BHS
Frequency
Total Length

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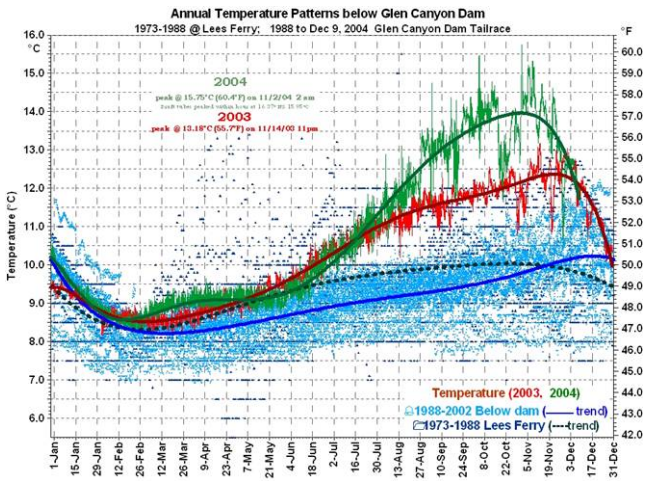
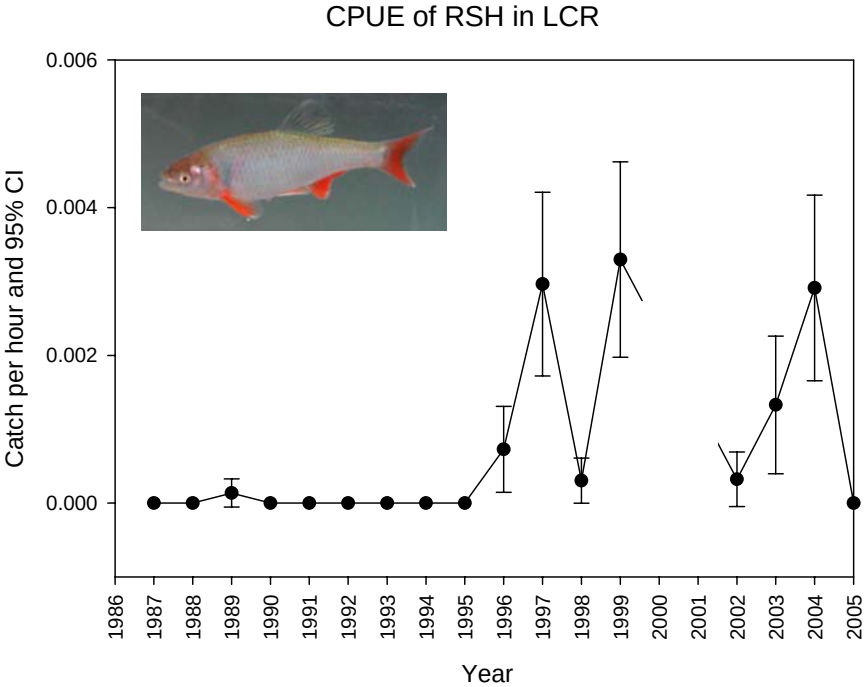
Why the increase in suckers ?

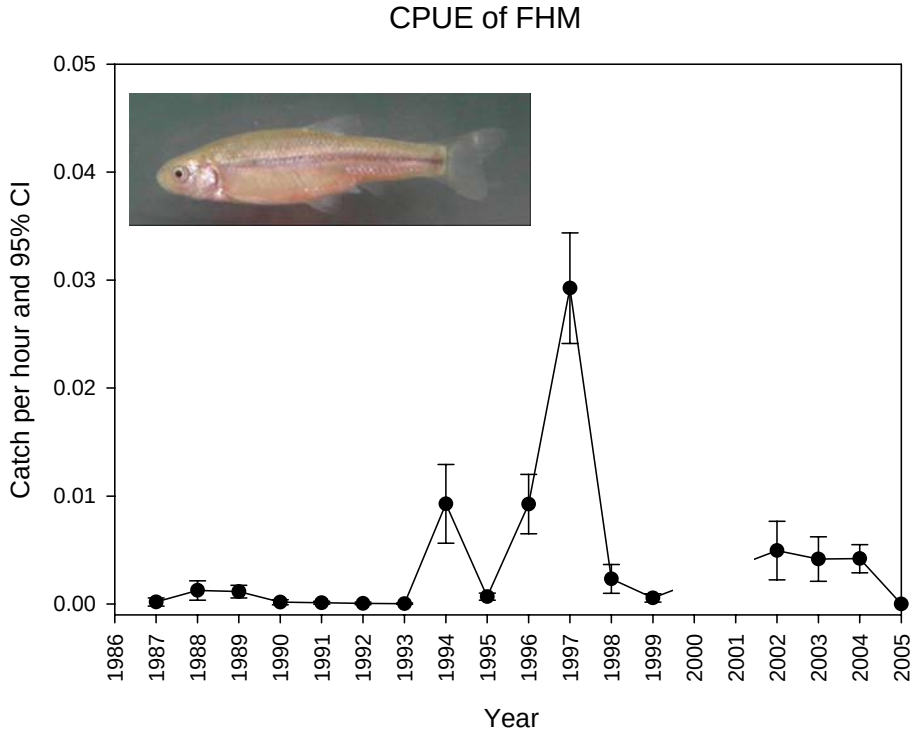
- Higher mainstem water temperatures

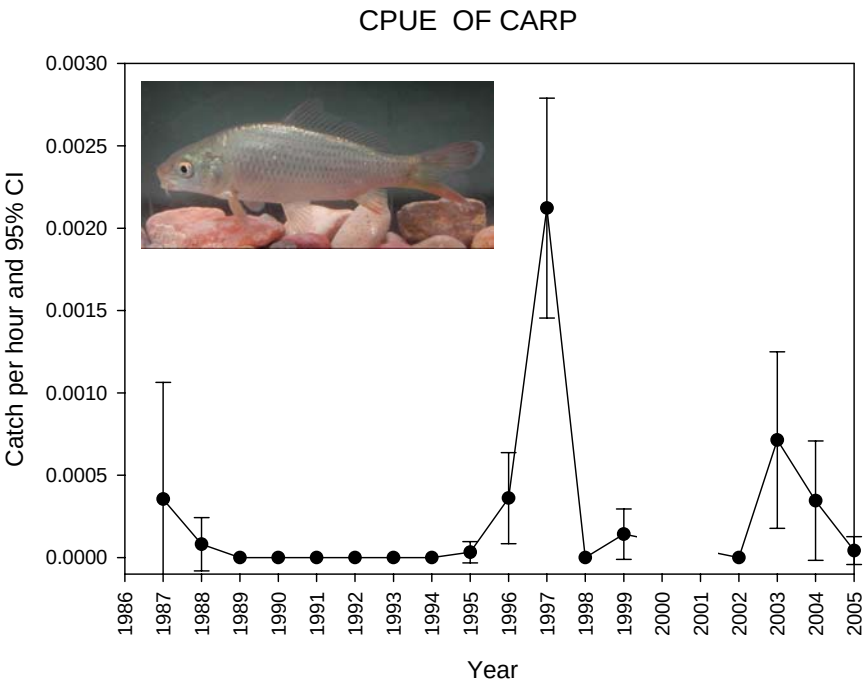


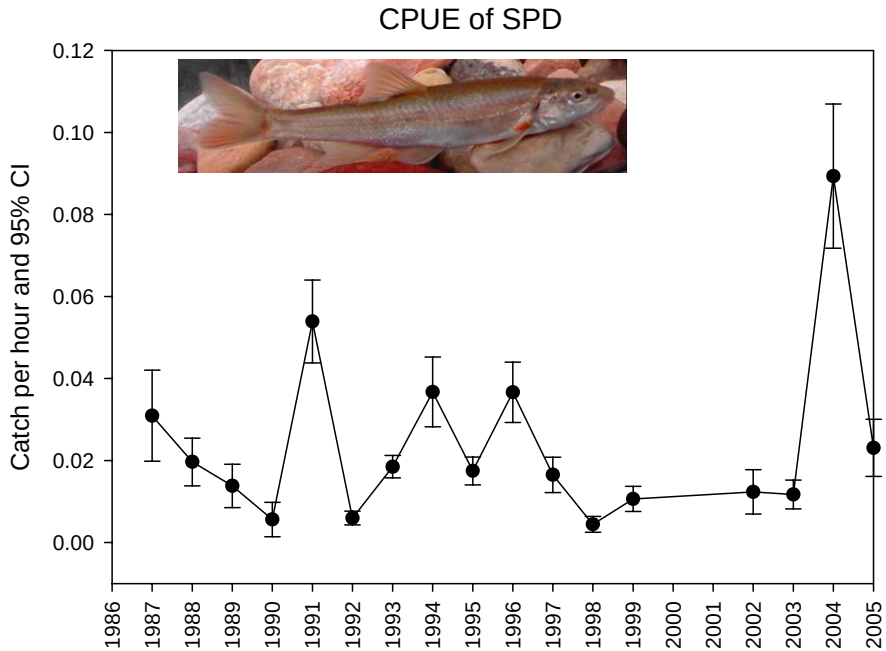
S. Huftle

- Mechanical removal of predators

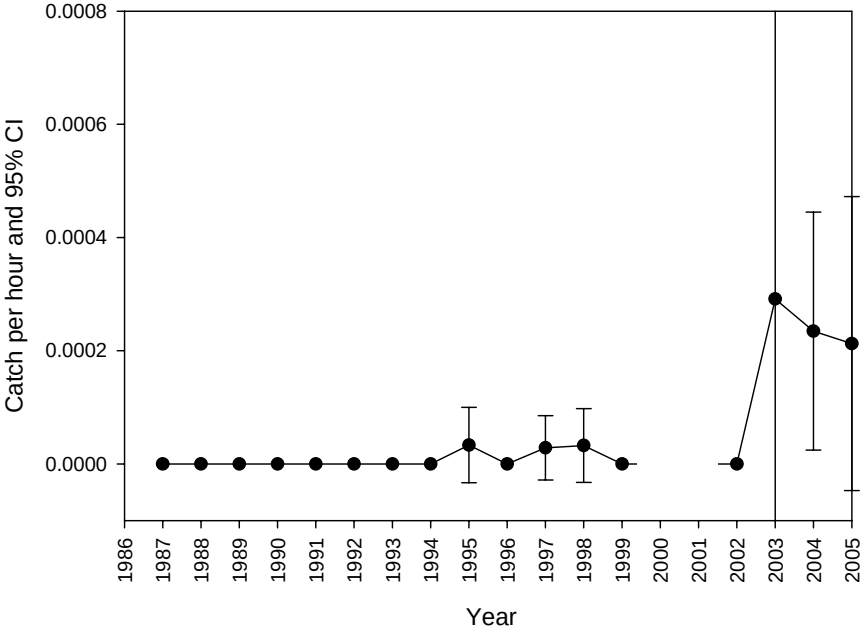

CPUE of RSH in LCR
Catch per hour and 95% CI
0.006
0.004
0.002
0.000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005
Year


CPUE of FHM
Catch per hour and 95% CI
0.05
0.04
0.03
0.02
0.01
0.00
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005
Year

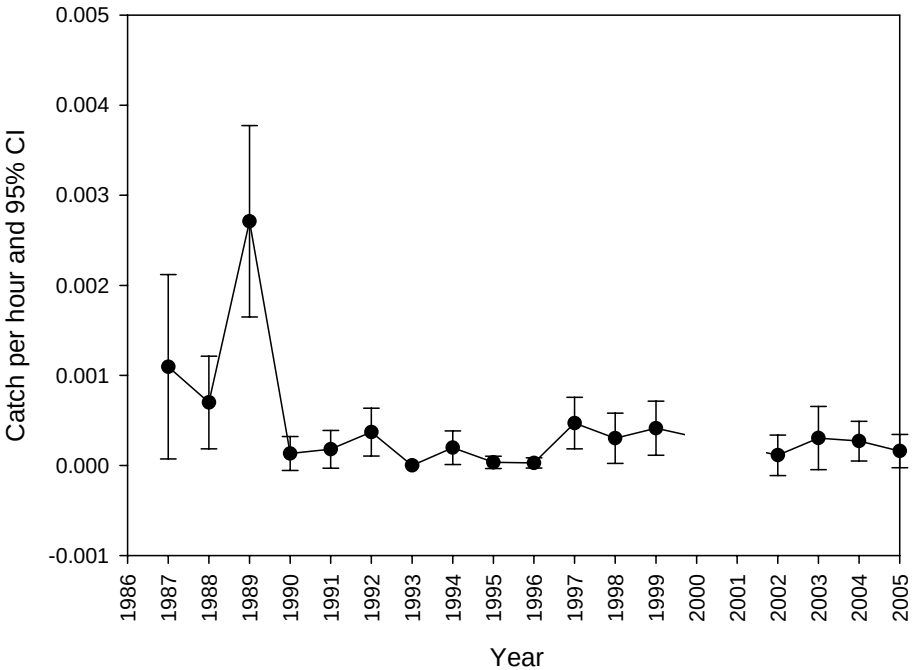

CPUE OF CARP
Catch per hour and 95% CI
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005
Year

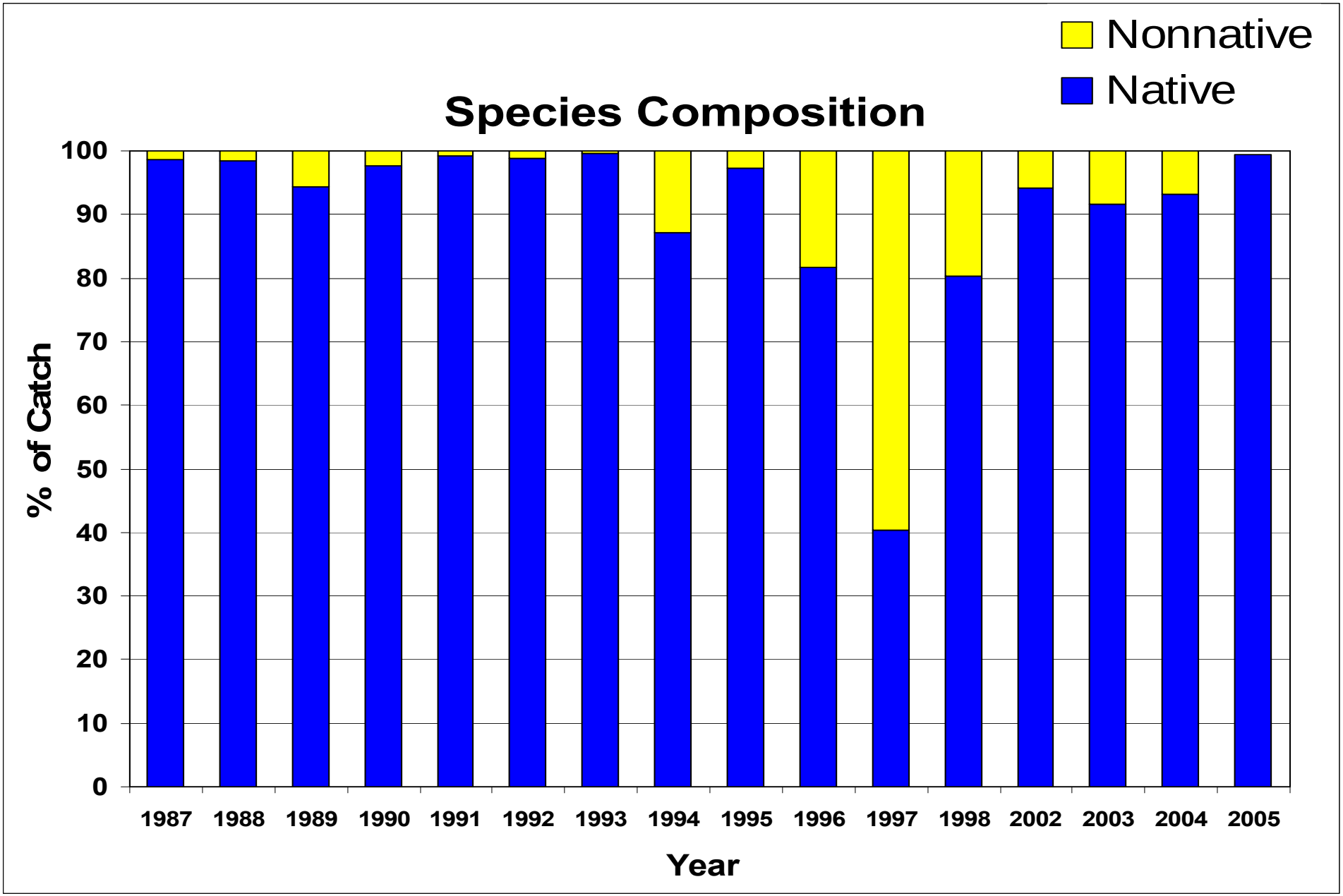

CPUE of SPD
Catch per hour and 95% CI
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

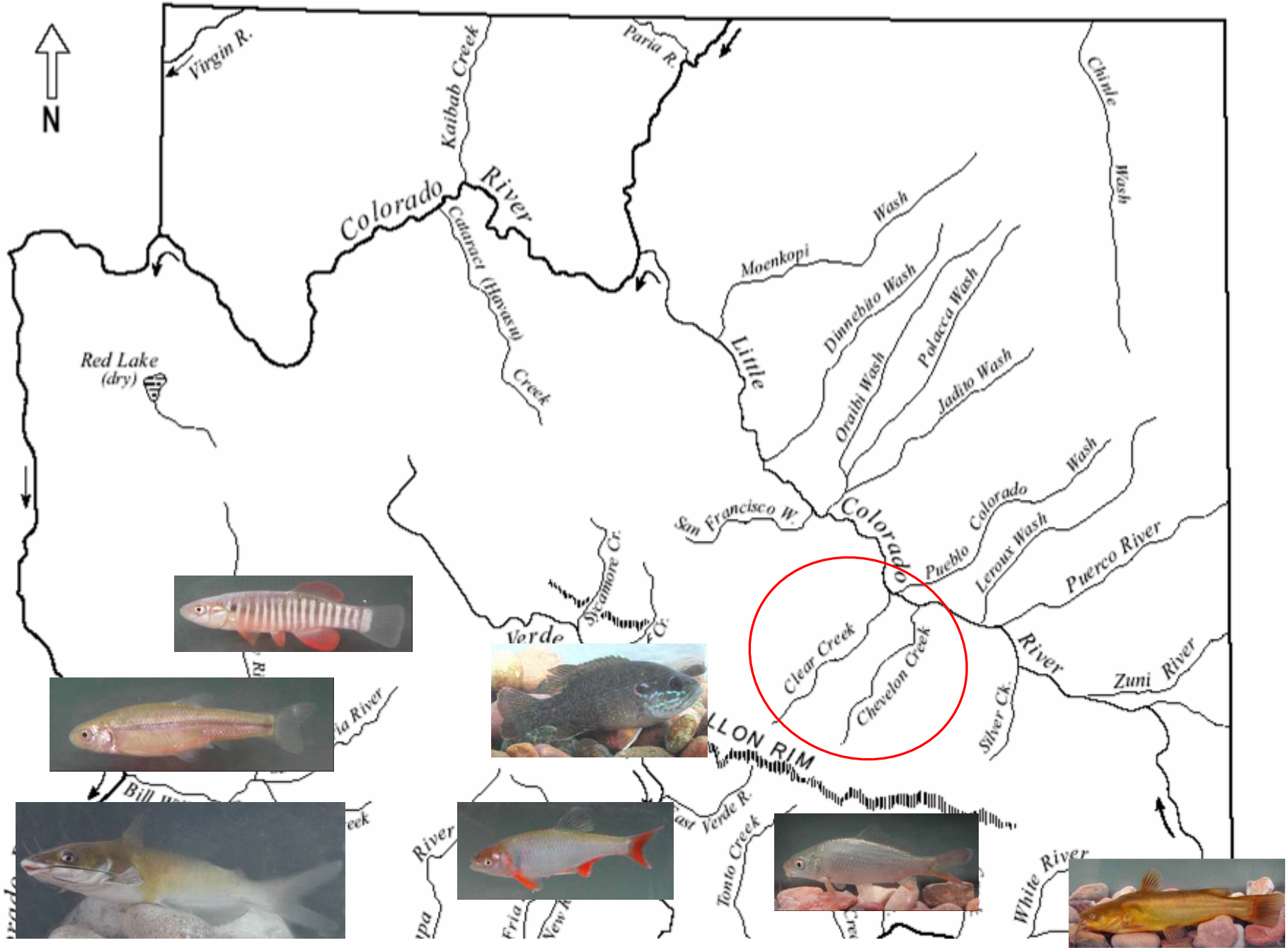
CPUE oF BULLHEAD CATFISH



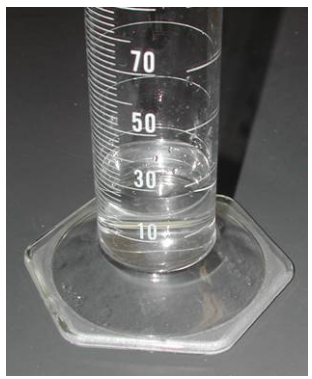
CPUE OF CHANNEL CATFISH




Nonnative
Native
Species Composition
% of Catch
100
90
80
70
60
50
40
30
20
10
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
2002
2003
2004
2005
Year


N
Virgin R.
Kaibab Creek
Paria R.
Chinle Wash
Colorado River
Cataract (Havasu) Creek
Moenkopi Wash
Dinnebito Wash
Polacca Wash
Jadito Wash
Oraibi Wash
Little Colorado
Red Lake (dry)
San Francisco W.
Pueblo Colorado Wash
Leroux Wash
Puerco River
Sycamore Cr.
Verde
Clear Creek
Chevelon Creek
Silver Ck.
Zuni River
LLON RIM
Bill W
River
Tonto Creek
East Verde R.
White River

Asian Fish tapeworm
(*Bothriocephalus acheilognathi*)

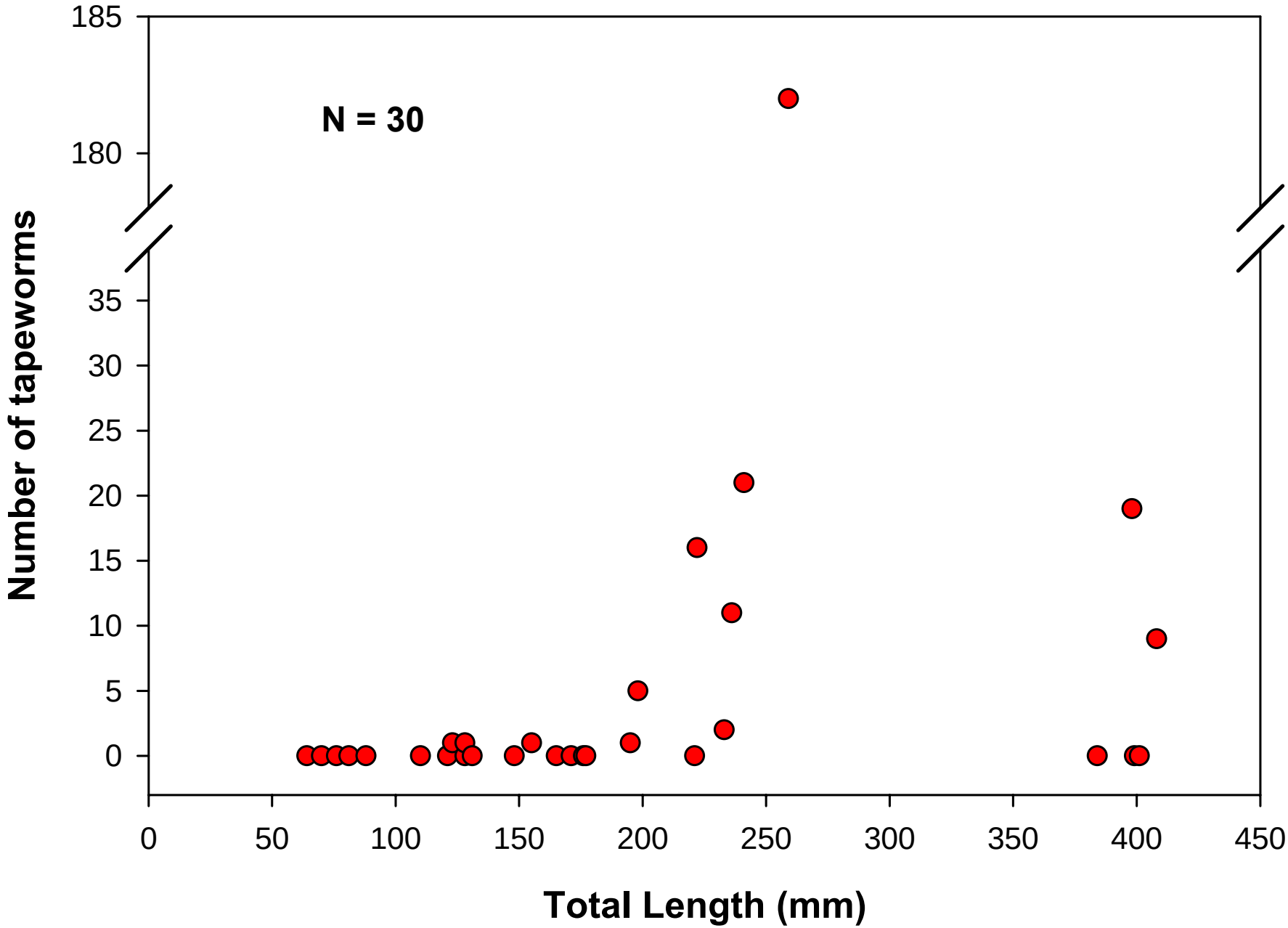


(25 ml) Isopropyl alcohol

183 tapeworms

259 mm TL

2005 Asian Tapeworm in Humpback chub



Conclusions

CPUE of suckers has increased significantly in the last 3 years

Threats to humpback chub may come from the upstream in the Little Colorado River

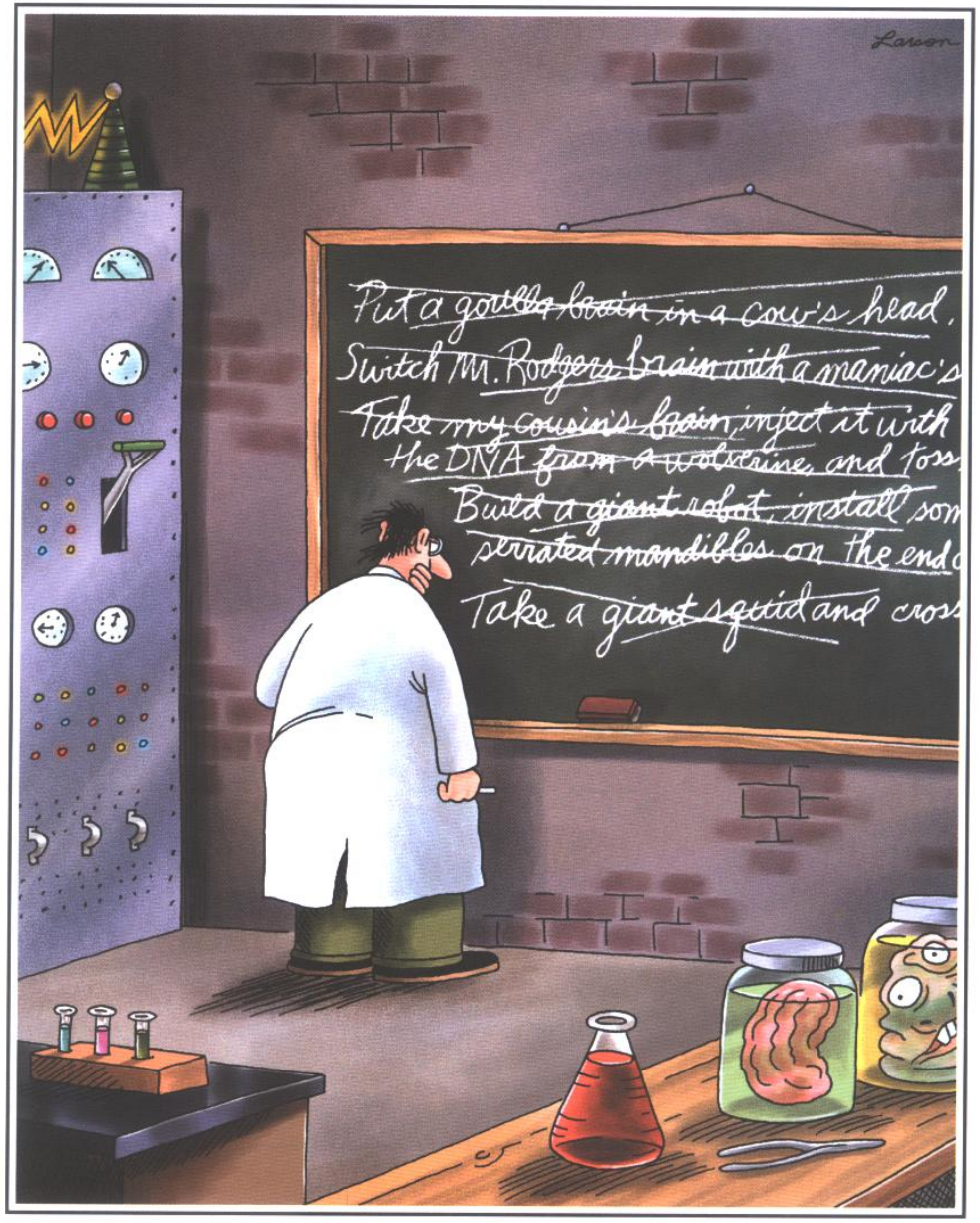
Effects of warmer water on Asian tapeworm infestation remain to be seen

Acknowledgements

Scott Rogers, Teresa Hunt,
Brian Clark, Clay Nelson
AZ Game and Fish

Grand Canyon Monitoring and Research Center
US Fish and Wildlife Service

SWCA Environmental Consultants Inc.



The curse of mad scientist's block