Economic Relationships between Aquaculture and Capture Fisheries : Republic of Korea

26 October, 2010

Session 7

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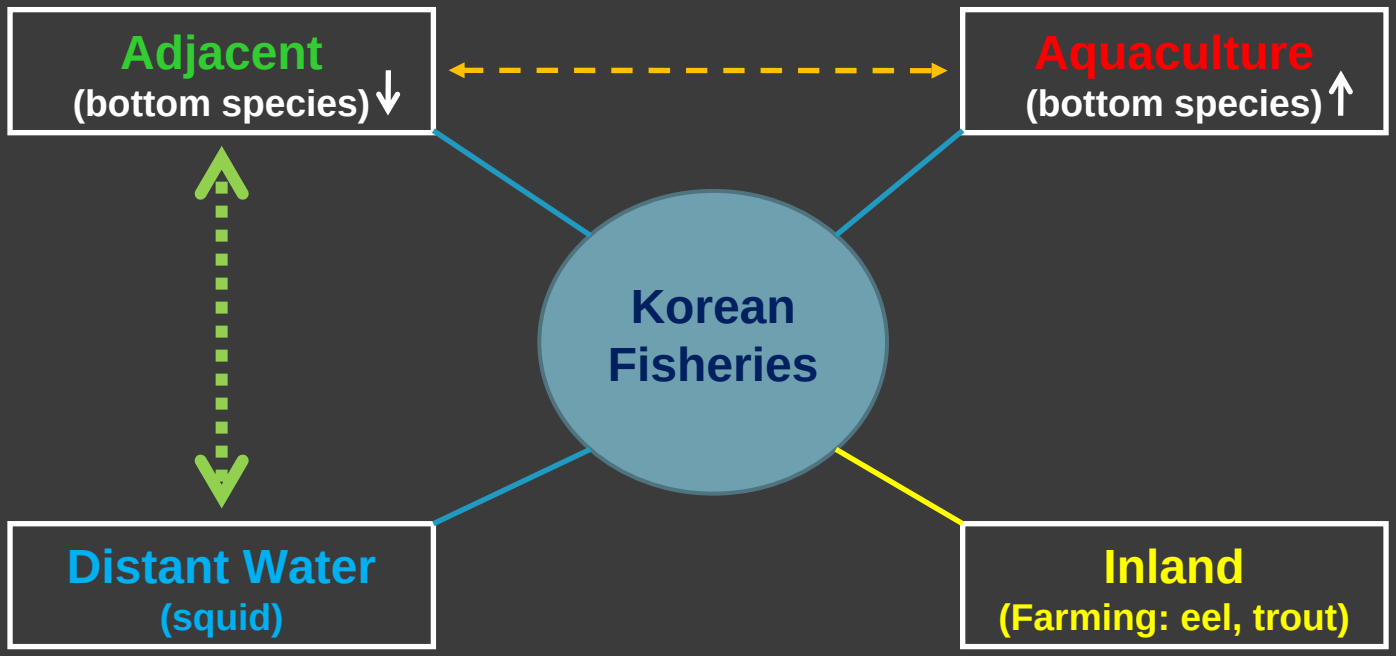
The Ocean Geography of Korea

Structure of Korean Fisheries

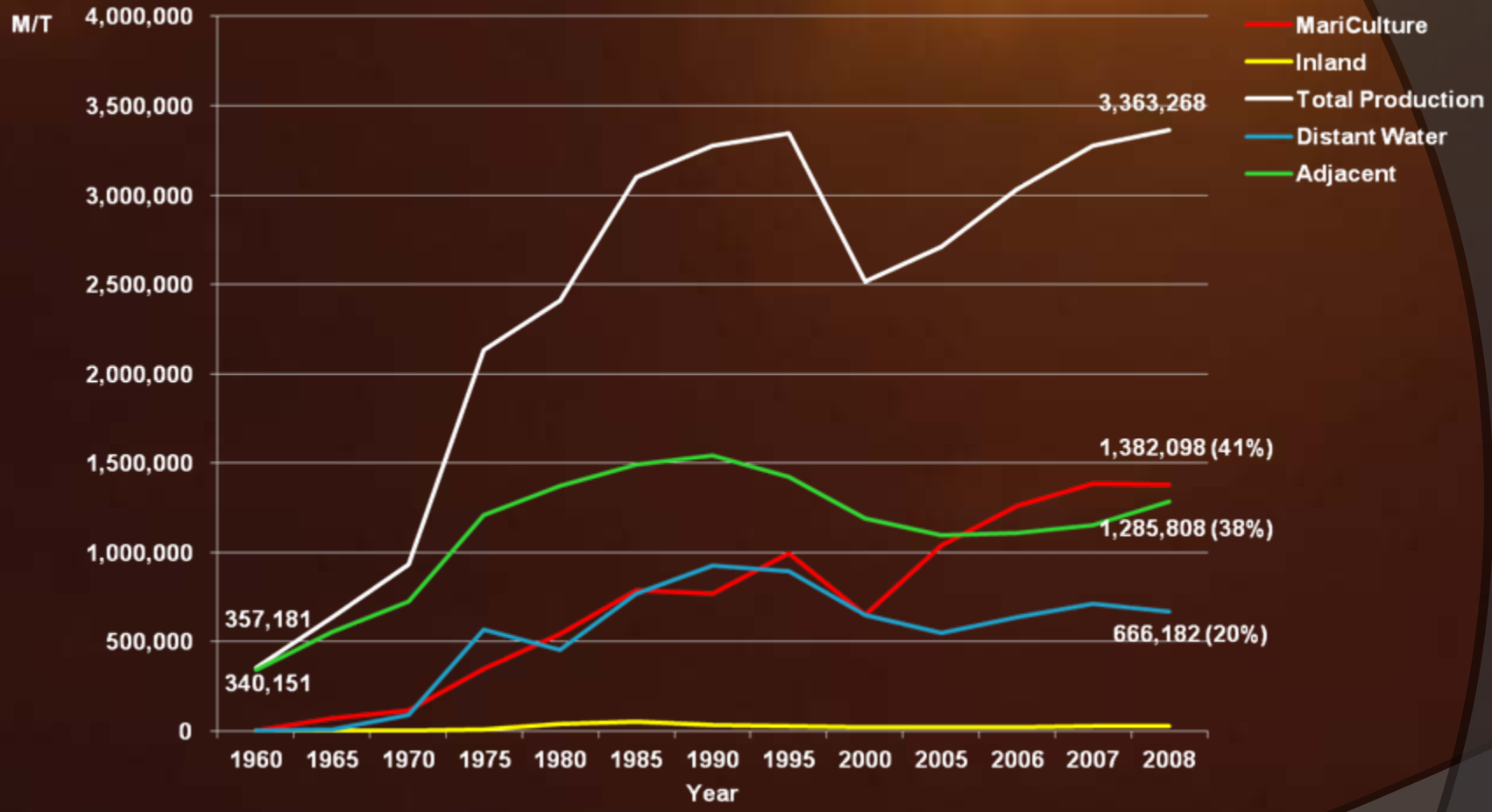


I. Production and Value by Fishery Category
(The Base Year : 2008)

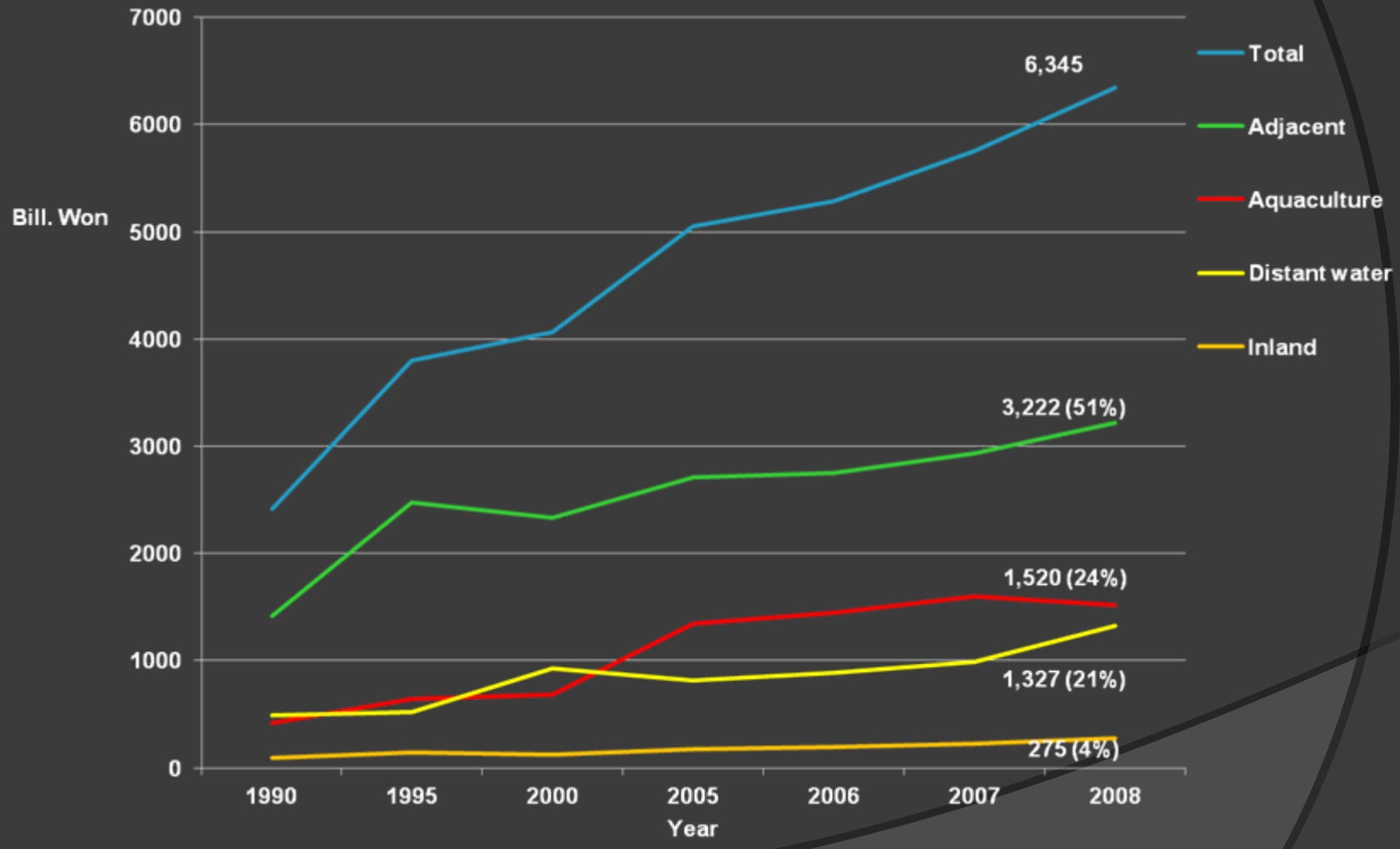
1. Production

(Unit: M/T)

Year	Total Production	Distant Water	Wha-ling	Adjacent (Wild Catch)								Mari culture	Inland
				Adjacent Total	Fish	Crust-acean	Mollusks			Sea Weed	Other Marine Animal		
							Sub Total	Shell Fish	Others				
1960	357,181	914	582	340,151	230,540	11,009	71,333	29,195	42,138	23,988	3,281		
1965	636,512	8,563	860	553,070	384,578	21,935	91,309	18,628	72,681	48,362	6,886	73,675	344
1970	935,465	89,621	1,866	724,365	506,063	16,354	113,835	35,708	78,132	72,343	15,770	119,211	398
1975	2,134,979	565,593	1,608	1,207,753	920,672	48,672	143,319	79,730	63,589	84,888	10,199	351,396	8,629
1980	2,410,346	458,209	2,023	1,370,324	1,052,077	49,296	193,864	83,104	110,760	59,194	15,893	540,564	39,226
1985	3,102,605	767,030	426	1,494,514	1,138,596	76,969	219,617	107,735	111,882	46,113	14,219	787,571	53,064
1990	3,274,506	925,331		1,542,013	1,170,906	112,073	219,100	106,728	112,372	30,326	9,608	772,731	34,431
1995	3,348,184	897,227		1,425,213	957,692	117,161	319,286	92,267	227,019	23,368	8,706	996,451	29,293
2000	2,514,225	651,207		1,189,000	769,628	74,994	325,150	77,103	248,047	13,023	6,205	653,373	20,585
2005	2,714,050	552,096		1,097,041	721,947	62,075	292,534	81,071	211,517	15,212	5,278	1,041,074	23,839
2006	3,032,116	639,184		1,108,815	715,048	73,715	300,226	80,434	219,792	13,754	6,072	1,259,274	24,843
2007	3,277,695	712,832		1,152,299	761,970	85,297	279,325	73,714	205,611	18,189	7,518	1,385,804	26,760
2008	3,363,268	666,182		1,285,808	878,348	88,052	297,702	81,399	216,303	13,866	7,840	1,382,098	29,180


M/T
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2006
2007
2008
Year
MariCulture
Inland
Total Production
Distant Water
Adjacent
3,363,268
1,382,098 (41%)
1,285,808 (38%)
666,182 (20%)
357,181
340,151

2. Value


7000
6000
5000
4000
3000
2000
1000
0
Bill. Won
1990
1995
2000
2005
2006
2007
2008
Year
6,345
3,222 (51%)
1,520 (24%)
1,327 (21%)
275 (4%)
Total
Adjacent
Aquaculture
Distant water
Inland

II. Production of Major Marine Wild Fish

(Unit: M/T)

Year	Anchovy	Chub Mackerel	Squid	Hair tail	Herring	Spanish Mackerel	Yellow Croker	Snow Crab	Horse Mackerel
1960	34,789	2,175	37,644	40,098	55	3,597	21,687		23,452
1965	56,761	7,339	68,398	45,384	7	5,608	39,608		26,496
1970	54,047	38,256	72,142	69,082	746	5,276	31,765		883
1975	175,451	70,123	37,238	120,178	2,386	5,241	40,056		6,563
1980	169,657	62,690	48,490	119,980	182	17,511	48,843		565
1985	143,512	68,479	42,879	127,606	773	10,265	6,872		15,702
1990	168,101	97,229	75,293	103,970	6,317	16,904	27,890		17,376
1995	230,679	200,481	200,897	94,596	8,622	17,429	25,173	33,155	12,269
2000	201,192	145,908	226,309	81,050	13,473	25,641	19,630	16,281	19,510
2005	249,001	135,596	189,126	60,086	7,592	33,794	15,272	21,926	42,608
2006	265,346	101,427	197,084	63,739	12,496	36,484	21,428	23,890	23,227
2007	221,110	143,776	174,479	66,029	28,280	42,199	34,221	25,388	19,089
2008	261,532	190,456	186,160	72,313	45,472	40,809	33,200	28,293	22,752

Anchovy/Mackerel/Squid
(50% of total adjacent wild catch in 2008)

III. Mari-culture Production and Value

(Sea weeds: 65% of total mari-culture production)

(PQ: production quantity; PV production value)

(Unit : M/T, Million Won)

Species / Year		1990		1995		2000		2005		2006		2007		2008	
		PQ	PV	PQ	PV	PQ	PV	PQ	PV	PQ	PV	PQ	PV	PQ	PV
Total		454,438	291,089	574,420	516,179	404,629	536,734	736,289	1,169,061	915,124	1,276,368	1,026,712	1,367,771	970,899	1,345,674
Fish	Sub total	1,651	25,575	7,951	91,929	24,205	277,769	73,027	629,497	81,902	712,714	89,284	720,230	93,260	702,924
	Flounder	1,037	19,998	6,733	78,390	14,127	190,090	40,075	353,584	43,852	458,932	41,171	438,934	46,432	408,261
	Red sea bream	228	2,270	25	354	412	4,199	5,816	52,686	4,386	35,801	7,213	57,386	7,424	55,878
	Rockfish	386	3,296	1,159	12,815	8,698	77,630	21,636	201,616	28,013	193,311	35,979	202,658	33,255	2,111,924
	Gray Gullet	0	9	34	369	968	5,848	5,500	21,610	5,651	24,668	4,921	21,250	6,149	27,592
Crustacean	Sub total	257	2,991	404	5,387	1,158	19,215	1,399	23,295	1,683	25,621	1,321	16,187	1,924	27,718
	Big shrimp	257	2,991	404	5,387,785	1,158	19,215	1,399	23,295	1,022	14,786	463	4,877	130	2,114
	White leg shrimp	0	0	0	0	0	0	0	0	661	10,835	858	11,310	1,794	25,604
Shellfish	Sub total	290,598	118,456	281,830	163,623	206,739	112,645	315,122	274,093	382,290	311,680	442,566	361,124	338,105	340,320
	Oyster	219,124	59,174	191,156	108,320	177,079	83,814	251,706	130,894	283,296	131,410	321,276	130,555	249,976	118,444
	Abalone	2	58	61	2,884	20	1,941	2,062	92,813	3,050	120,001	4,350	161,987	5,146	171,410
	Manila clam	61,713	55,487	15,260	22,138	17,927	22,089	17,401	32,468	14,327	27,765	18,819	32,557	15,541	25,931
	Mussel	9,759	3,735	75,353	30,280	11,713	4,800	43,953	17,917	81,617	32,502	98,121	36,024	67,442	24,533
Other Marine Animals	Sub total	32,291	15,858	26,301	23,491	16,225	14,560	10,746	19,541	8,646	15,721	11,627	19,433	10,446	18,241
	Sea squirt	11,523	4,607	3,675	2,546	13,889	12,385	1,412	3,200	1,519	2,908	2,309	4,041	2,620	4,818
	Ascician	20,768	11,251	22,626	20,945	2,336	2,175	9,334	16,340	7,127	12,812	9,318	15,391	7,826	13,422
Sea Weeds	Sub total	129,641	128,207	257,934	231,746	156,302	112,543	335,995	222,634	440,603	210,631	481,914	250,795	527,164	256,469
	Laver	97,637	120,228	192,960	201	130,488	100,276	197,610	191,255	217,559	169,278	210,956	193,988	224,242	194,373
	Kelp	8,084	2,284	27,295	5,922	14,160	7,283	108,327	19,749	201,919	27,845	250,049	43,745	285,221	46,193
	Fusimorme	23,920	5,694	37,679	23,903	11,654	4,983	30,058	11,629	21,125	13,508	20,909	13,061	17,701	15,902

Laver harvest

Sea mustard harvest

Pacific Oyster

1. Major Mari-culture Fish

Unit: M/T, Thousand Won

Year			1990	1995	2000	2005	2006	2007	2008
Flounder	Wild	FLWCQ	2,380	1,914	1,607	2,112	2,298	3,074	4,184
		FLWCV	15,105,679	17,255,295	19,571,829	25,154,523	26,275,242	32,467,219	44,041,173
	Culture	FLAQ	1,037	6,733	14,127	40,075	43,852	41,171	46,432
		FLAV	19,998,438	78,390,170	190,090,579	353,584,532	458,932,552	438,934,379	408,261,537
Red Sea Bream	Wild	SBWCQ	936	552	986	513	502	686	1,304
		SBWCQ	4,924,425	7,053,702	8,353,842	7,167,268	7,227,695	9,118,027	13,262,972
	Culture	SBAQ	228	25	412	5,816	4,386	7,213	7,424
		SBAV	2,270,736	354,258	4,199,941	52,686,262	35,801,670	57,386,465	55,878,047
Black Rock Fish	Wild	RFWCQ	5,072	4,674	4,787	4,725	5,113	5,809	5,588
		RFWCV	17,909,029	35,699,000	41,794,477	35,104,716	40,218,364	47,954,010	45,893,959
	Culture	RFAQ	386	1,159	8,698	21,636	28,013	35,979	33,255
		RFAV	3,296,635	12,815,639	77,630,569	201,616,109	193,311,914	202,658,724	211,192,934
Gray Mullet	Wild	GMWCQ	2,522	4,282	8,730	9,774	8,835	11,312	8,248
		GMWCV	9,308,372	23,663,676	32,128,041	22,516,999	21,753,145	25,549,301	22,321,839
	Culture	GMAQ	0	34	968	5,500	5,651	4,921	6,149
		GMAV	0	369,420	5,848,798	21,610,248	24,668,371	21,250,844	27,592,233

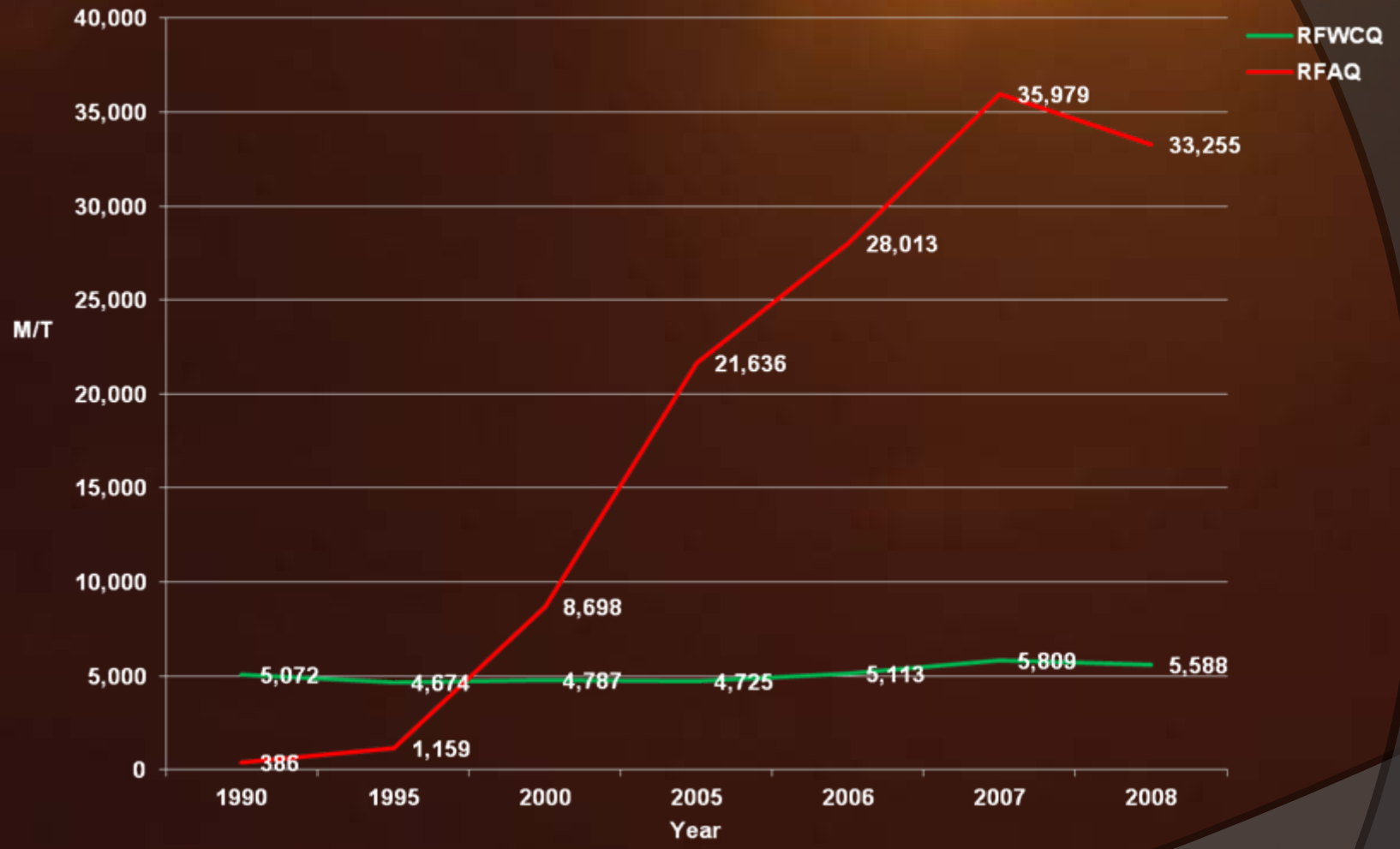
Olive flounder, *Paralichthys Olivaceus*

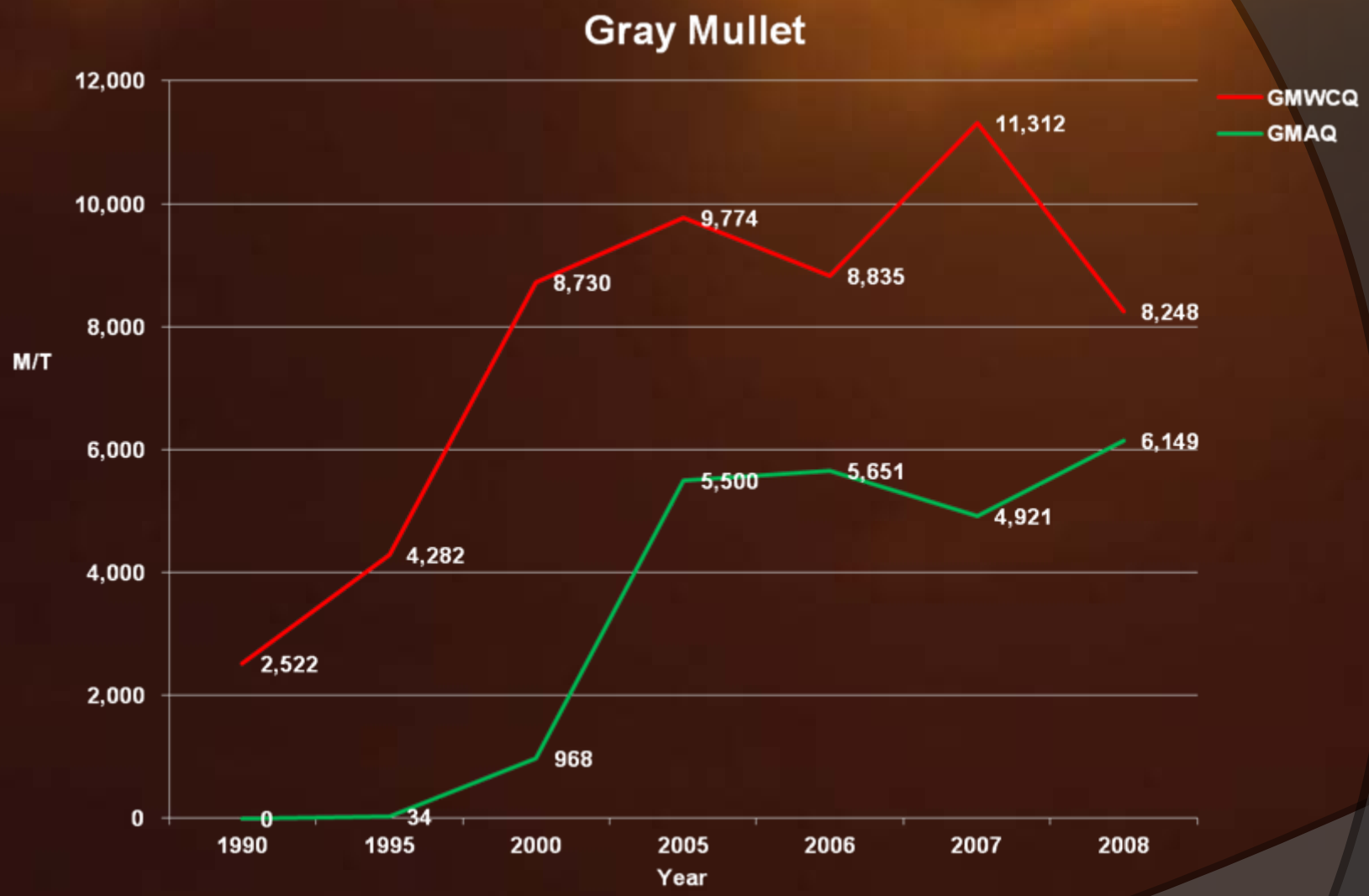
Korean rockfish, *Sebastes schlegeli*

Flounder(production: Wild vs. farmed)

Red Sea bream

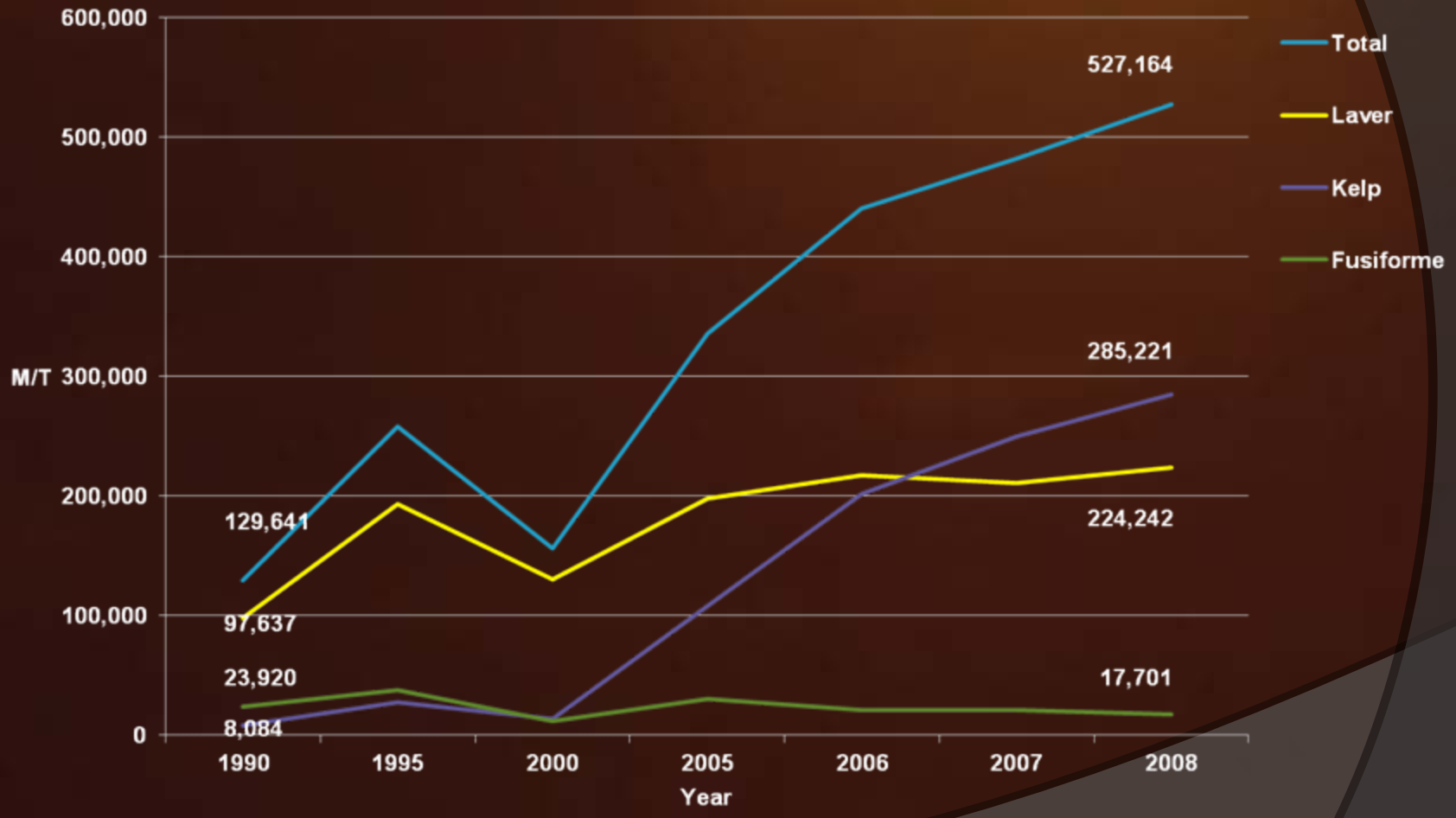
Korean Rockfish



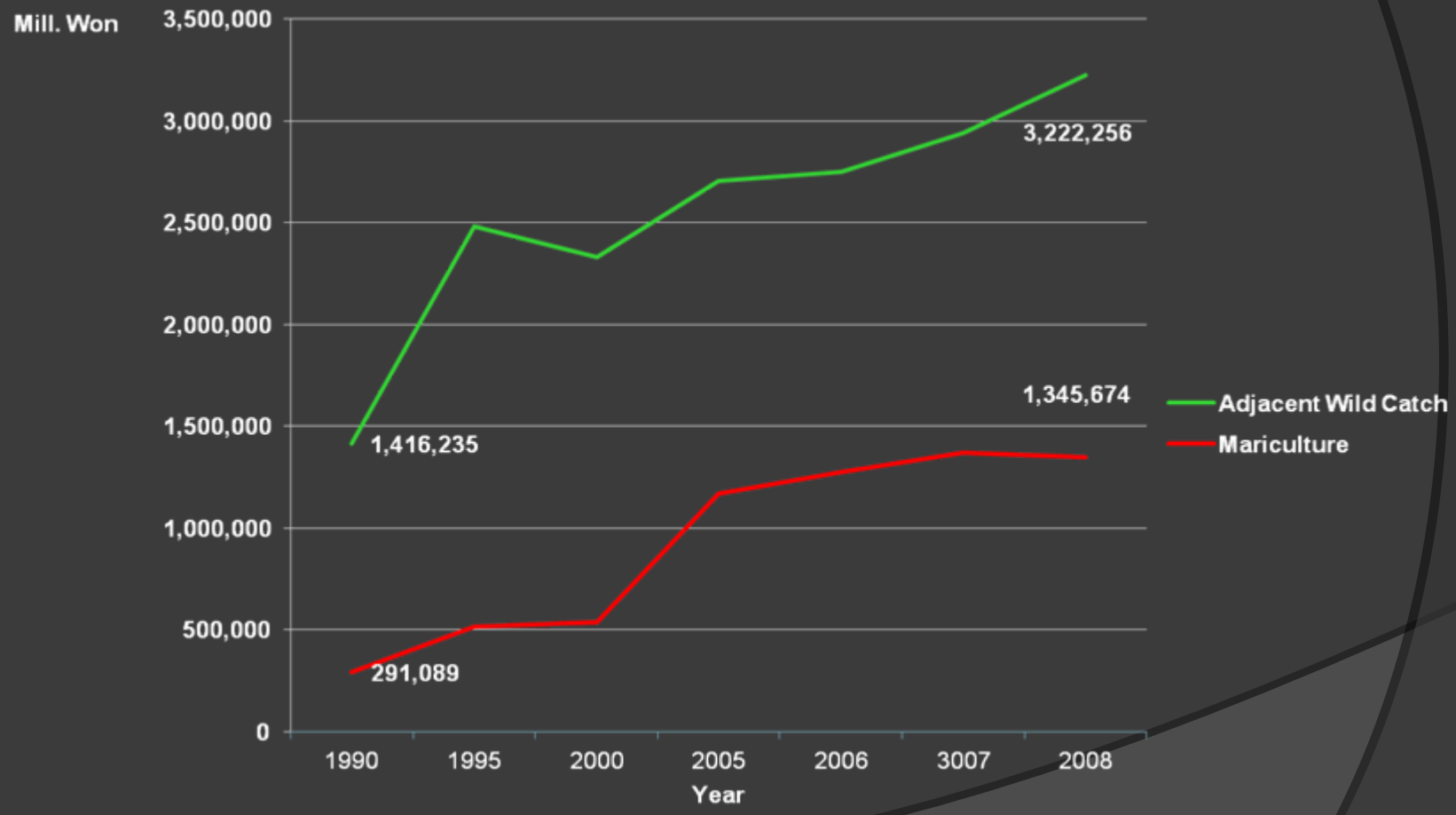

Gray Mullet
12,000
10,000
8,000
6,000
4,000
2,000
0
M/T
1990
1995
2000
2005
2006
2007
2008
Year
GMWCQ
GMAQ
2,522
4,282
8,730
9,774
8,835
11,312
8,248
0
34
968
5,500
5,651
4,921
6,149

2. Shellfish (Production)

3. Sea Weeds (Production)

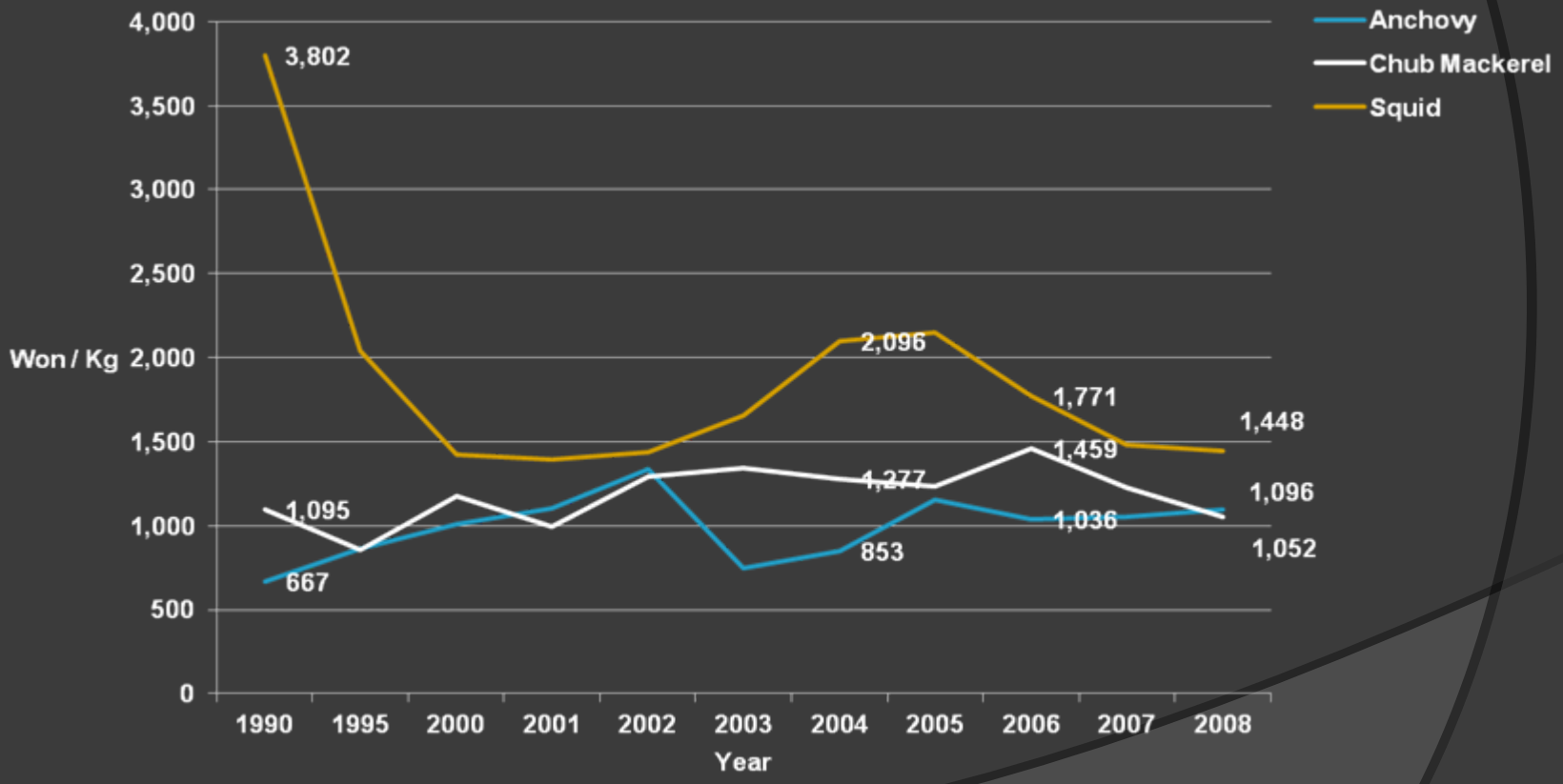


IV. Production Values (Adjacent Wild Catch vs. Mari-culture)



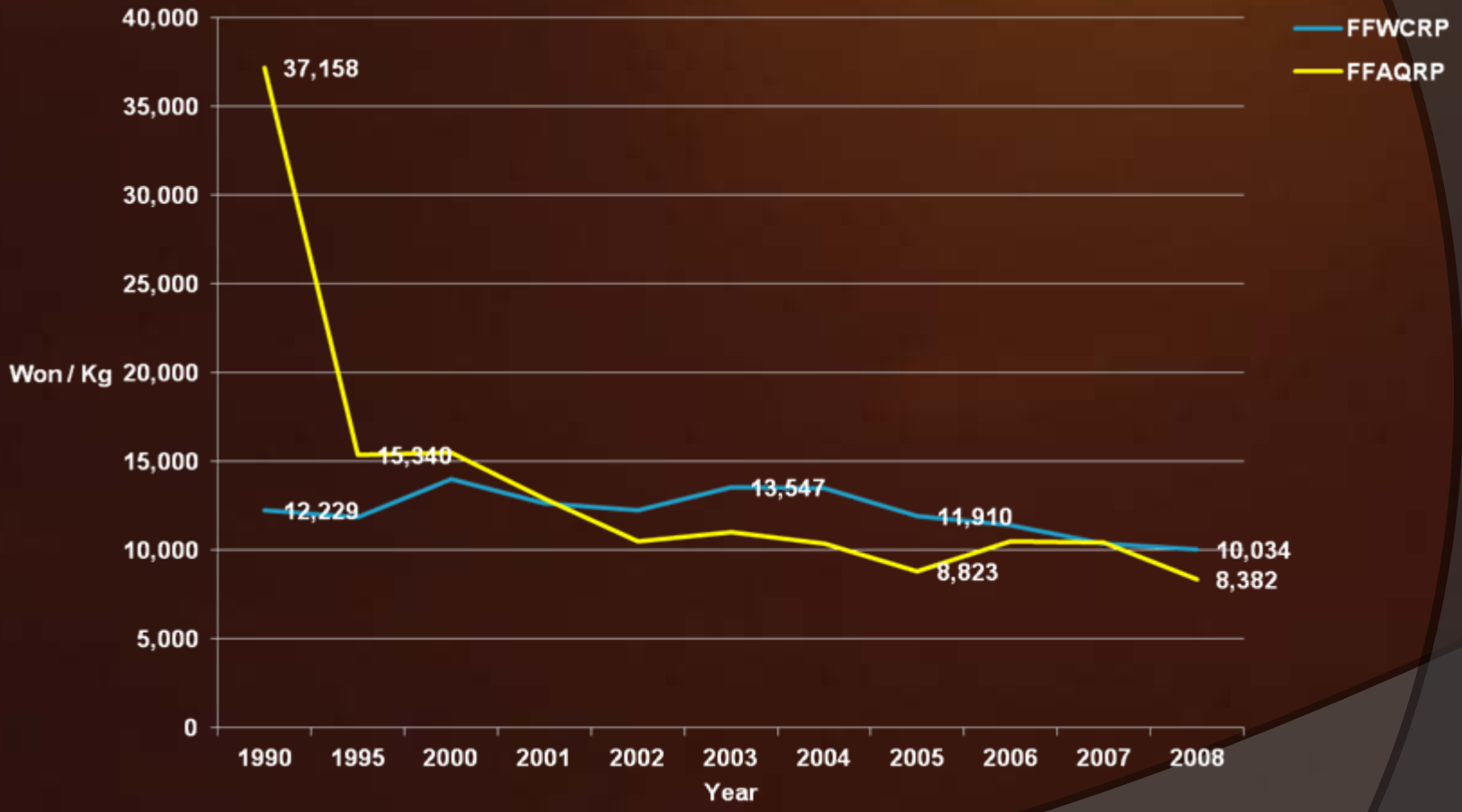
V. Real Prices of Wild and Farmed Fish

1. Wild Fish



2. Wild vs. Farmed

Flounder

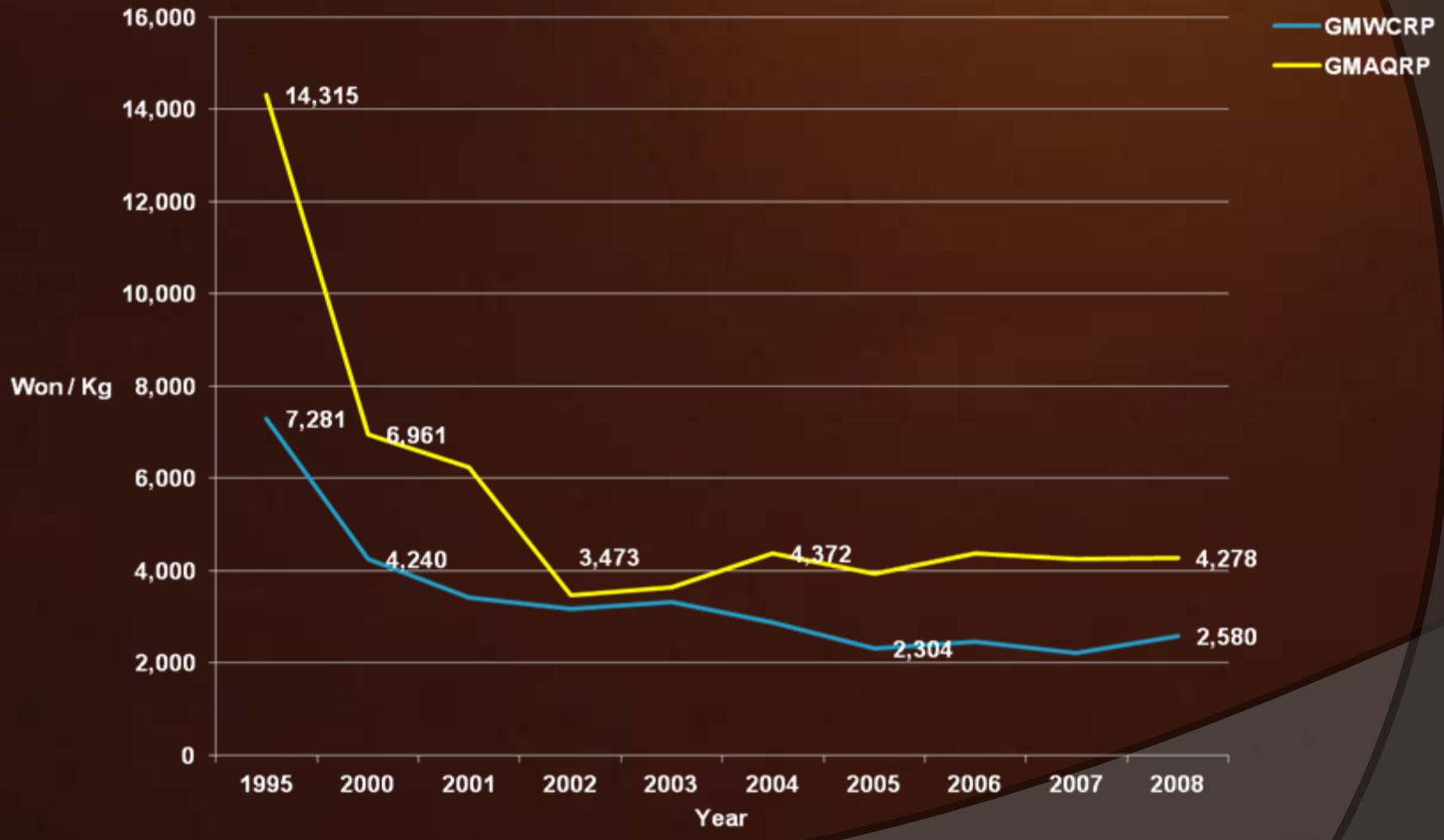


Red Sea Bream

Rockfish


RFWCRP
RSBAQRP
Won / Kg
Year
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1990
1995
2000
2001
2002
2003
2004
2005
2006
2007
2008
16,456
10,282
6,803
7,642
5,936
8,584
9,319
7,430
7,829
6,054

Gray Mullet


16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Won / Kg
1995
2000
2001
2002
2003
2004
2005
2006
2007
2008
Year
GMWCRP
GMAQRP
14,315
6,961
3,473
4,372
4,278
7,281
4,240
2,304
2,580

VI. Summary and Concluding Remarks

1. Production Quantity and Value of Korean Capture Fisheries and Mari-culture

- **Production**

  - Capture fisheries: stable at around 1.1 mill. M/T (1.3 mill. M/T in 2008)

  - Mari-culture: remarkable increase since 2000(1.4 mill. M/T in 2000)

  - Distant water: stable at around 660 thousand M/T

- **Value**

  - Capture: much increase since 2005

  - Mari-culture: stagnated since 2005

- **Price advantage of domestic products**

  - disappearing because of trade liberalization

- **Korean import dependency**

  - Expected to be getting higher over time in the future

2. Major Factors of Affecting Korean Fisheries

- **Market liberalization(WTO DDA negotiations and FTAs)**
- **Bilateral fishery agreements in the Far East Region**
- **Structural adjustment(buyback programs)**
- **Stock enhancement programs(artificial reef installation, fry release and fishing ground beautification)**
- **Development of off-shore aquaculture technology(cage station mass culture technology) owing to on-shore water pollution problems**
- **Food safety regulations(HACCP, traceability and origin of product)**
- **Domestic and international regulations on IUU fishing**
- **Strengthening fisheries management by RFMOs(highly migratory species and bottom trawl fisheries)**
- **Climate change(changing marine ecosystem)**
- **Monsoon climate(a long rainy summer season and a long dry cold winter season)**

3. Policy Needs

- **Promoting development of more environmentally sound aquaculture technology, considering a larger role of aquaculture in response to increasing demand for fish and fish products.**

  However, tradeoffs between aquaculture expansion and marine environmental impacts should be duly regarded
- **Developing fishery policies adaptive to climate changes, considering human interactions with marine ecosystem**
- **Exploring regional cooperation mechanism for effective fisheries resource management in the Far East Region**
- **Developing effective ways of raising public awareness on sustainability of marine resources and ecosystems**