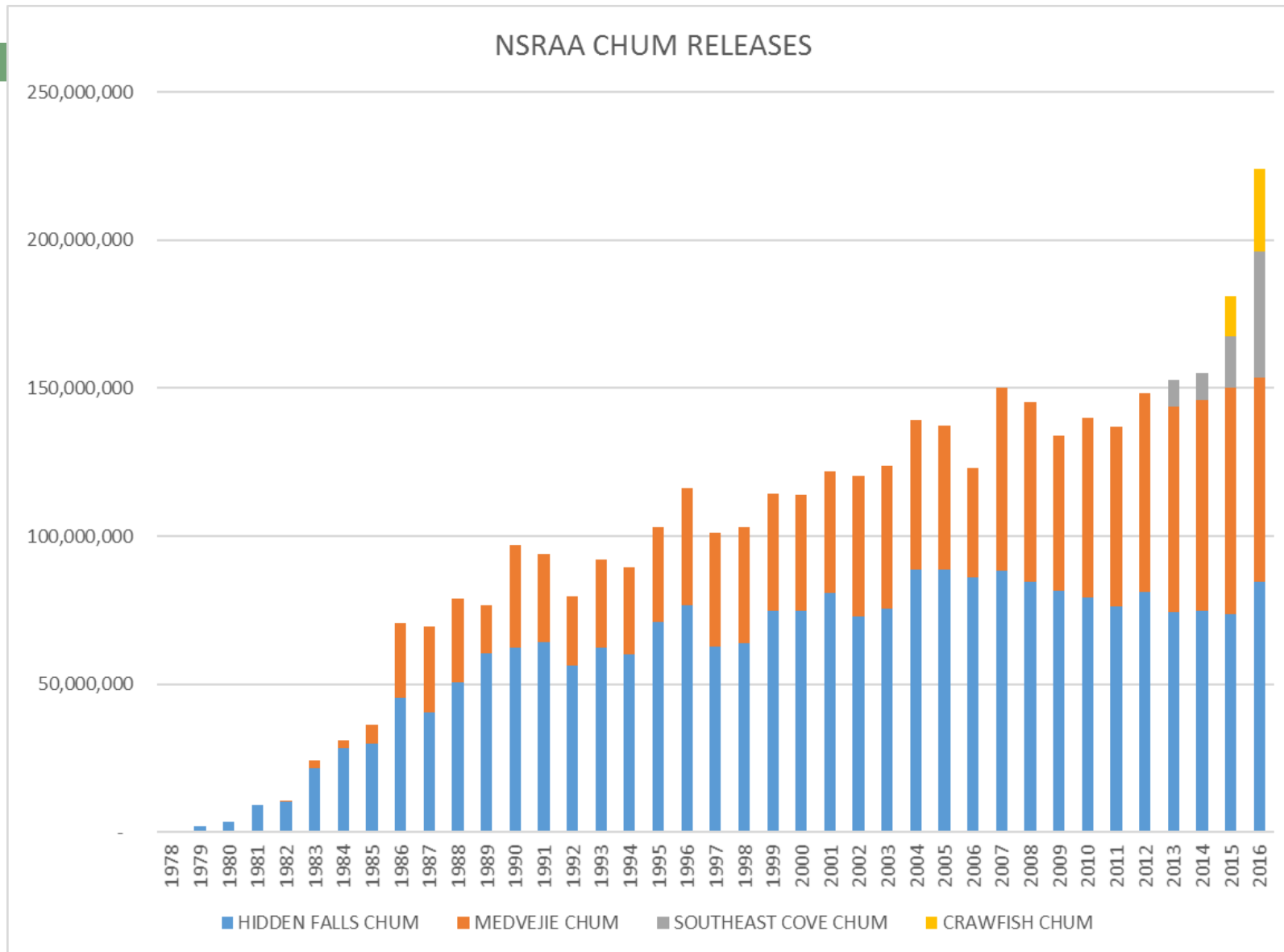


# NSRAA Chum – the next 5 years

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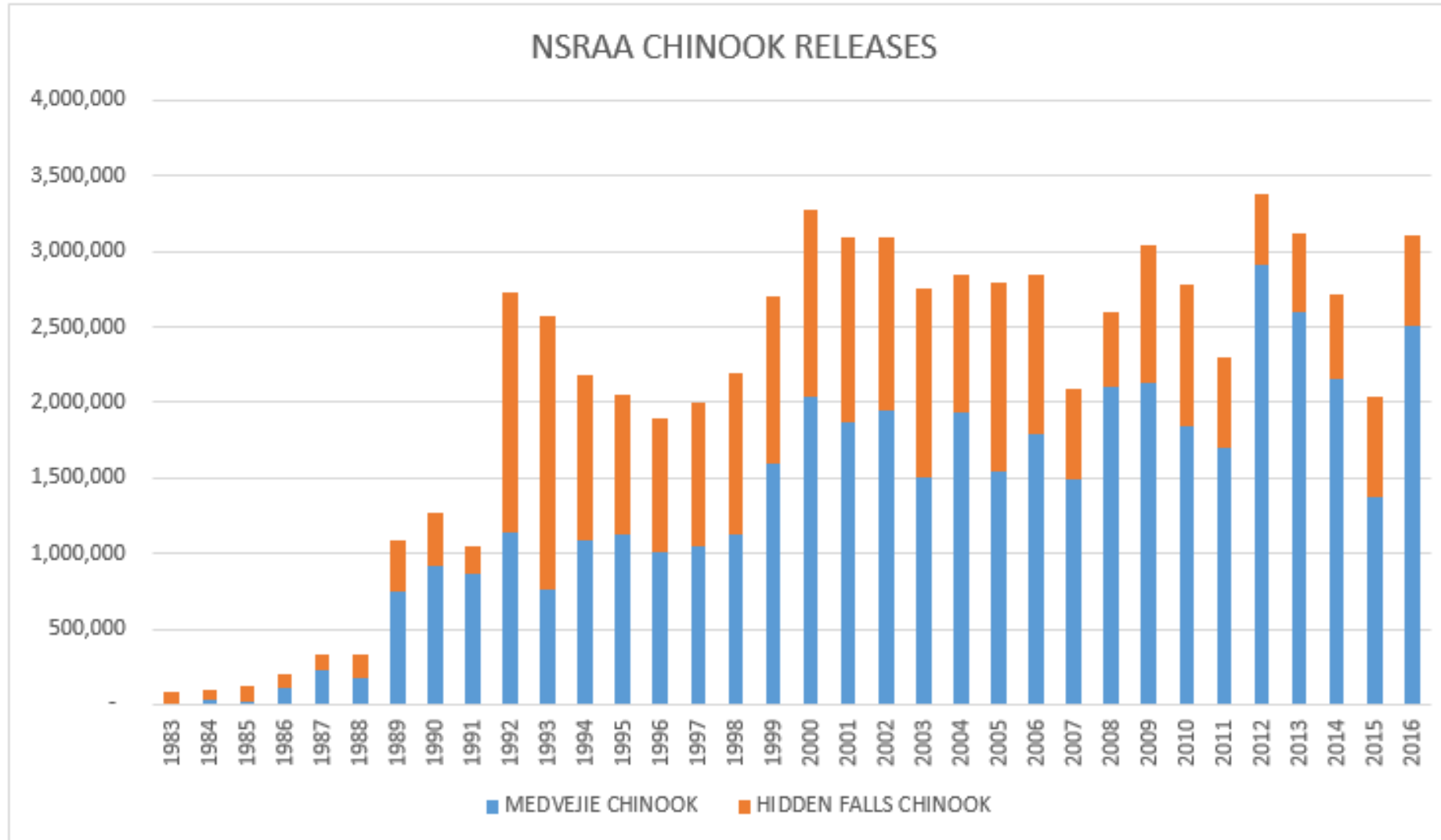
- Quick review of all species releases
- Chum - Fry release projections
- Chum - Adult returns
- Chum - Cost Recovery and Commercial value scenarios

# NSRAA Chum Releases



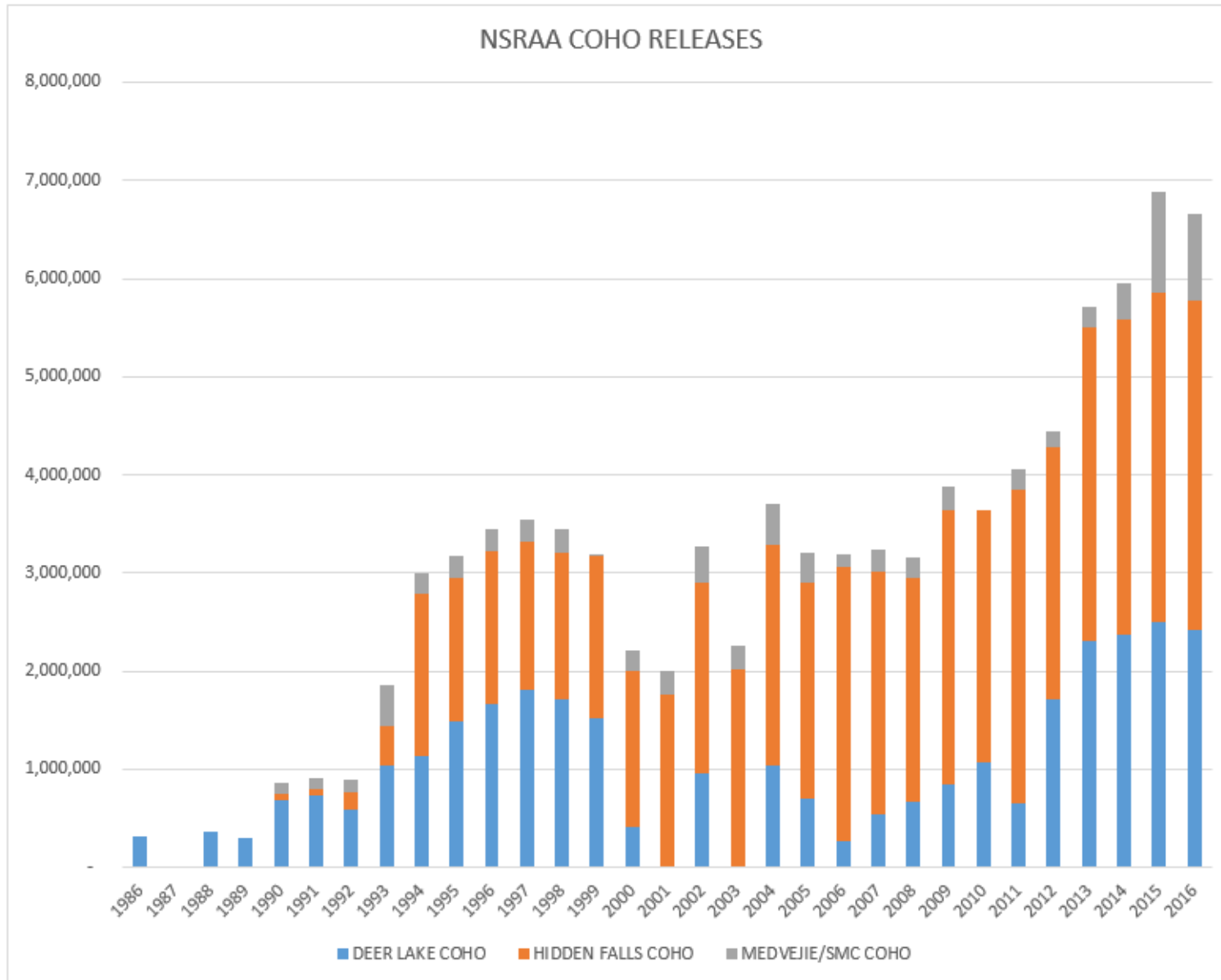
Chum releases  
by release year

# NSRAA Chinook Releases



Chinook releases by release year

# NSRAA Coho Releases



Coho releases  
by release year

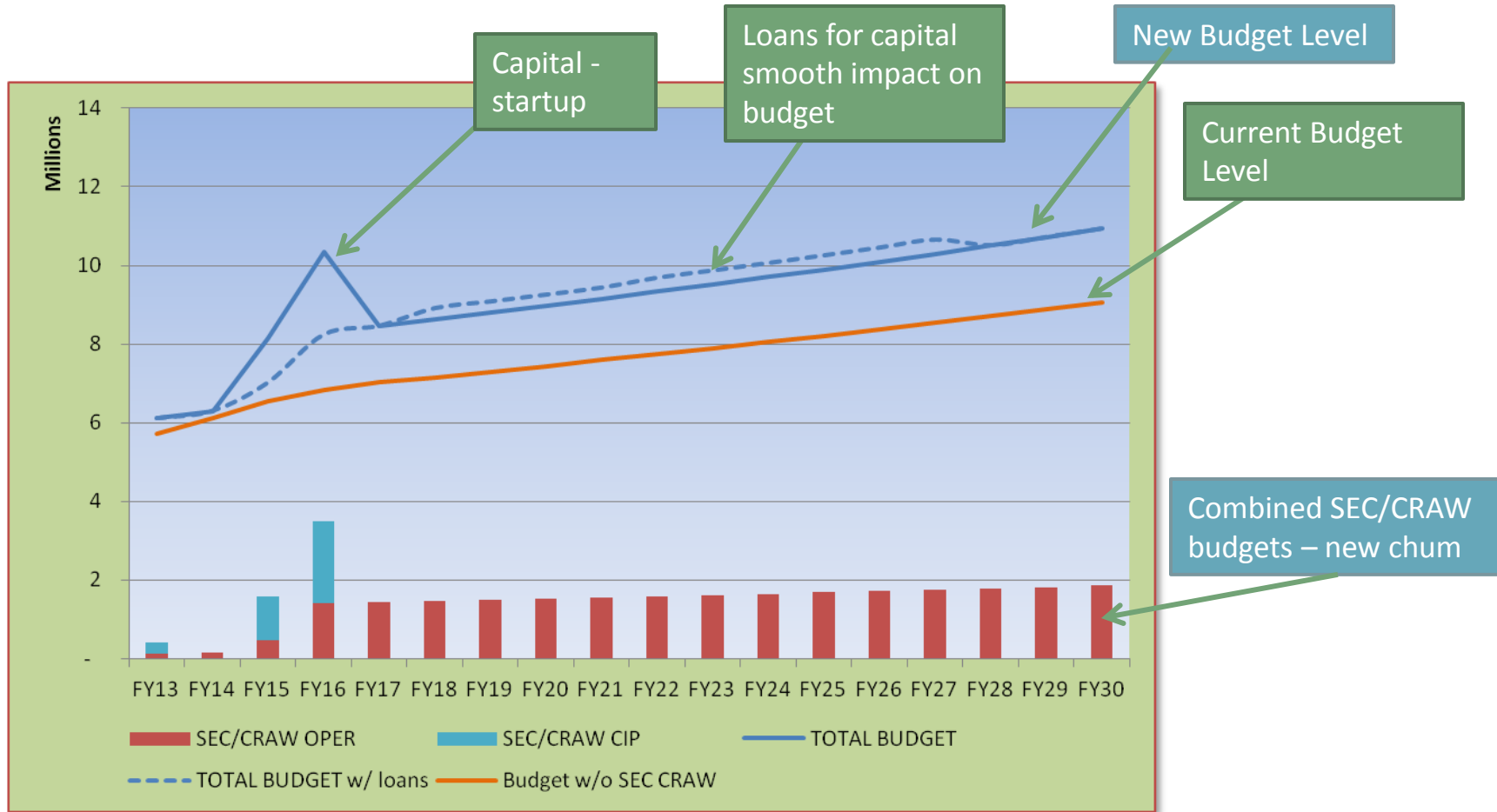
# NSRAA Budget with New Chum Programs

- The following 2 slides are a review of a pro forma created during the planning stages prior to adding the Southeast Cove and Crawfish Inlet programs.
- The first slide shows operational and capital costs of the new programs and the impact of these costs to the current budget.
- The second slide adds in an estimated value of returns from the two projects. Assumptions used were 7.8 pound average weight, \$0.65 per pound and 2.5% marine survival; no split is made for commercial and cost recovery.
- Note that value climbs steeply in 2018-2020 as the programs increase to full production.

# NSRAA Budget with New Chum Programs

Note: This is a review of a pro forma made during planning prior to adding Southeast Cove and Crawfish Inlet projects.

SEC = Southeast Cove  
 CRAW = Crawfish Inlet  
 OPER = Operations Budget  
 CIP= Capital Budget

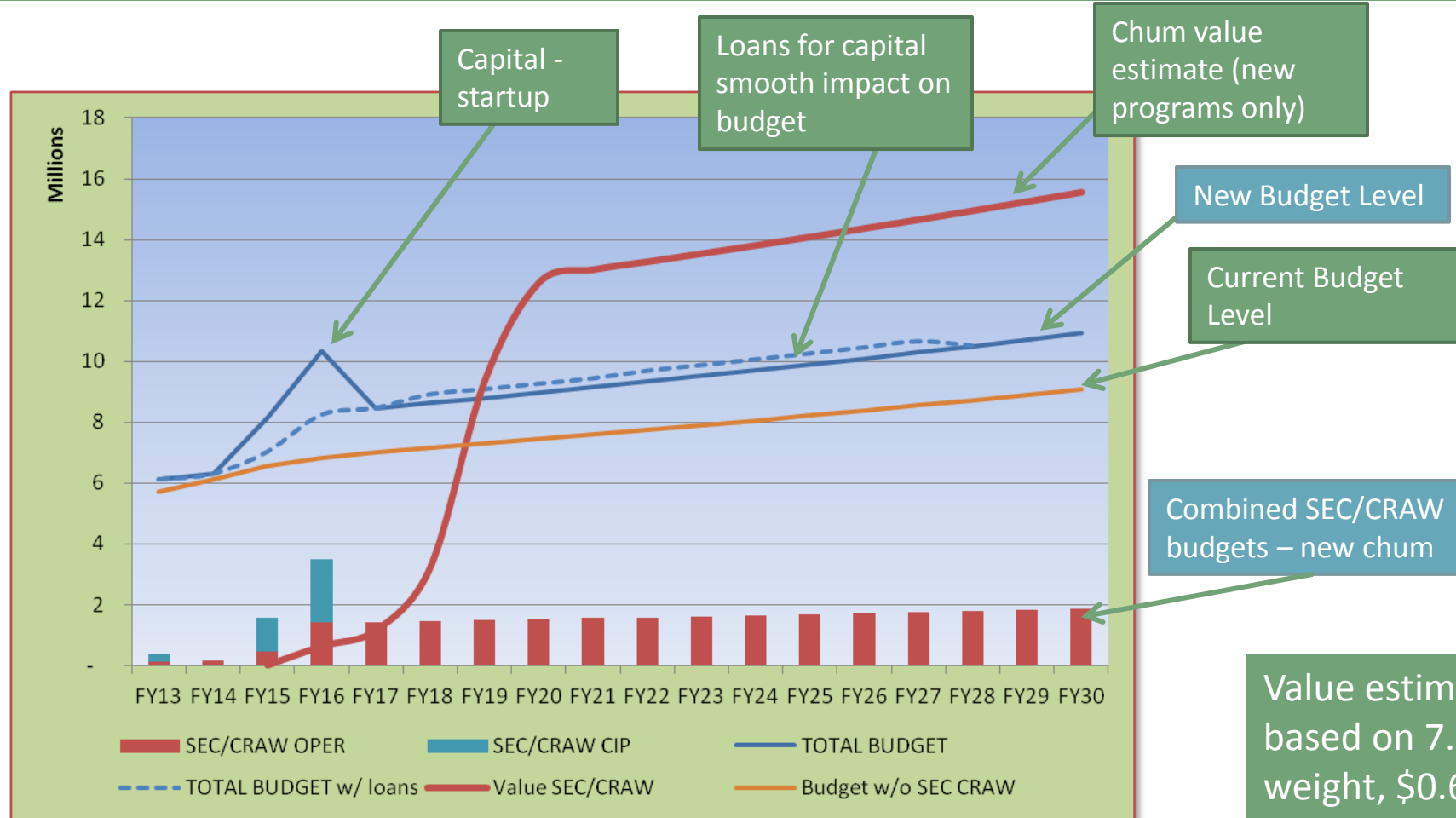


Annual 2% inflation and 2.5% cost of living increases applied

# NSRAA Budget with New Chum Programs

Note: This is a review of a pro forma made during planning prior to adding Southeast Cove and Crawfish Inlet projects.

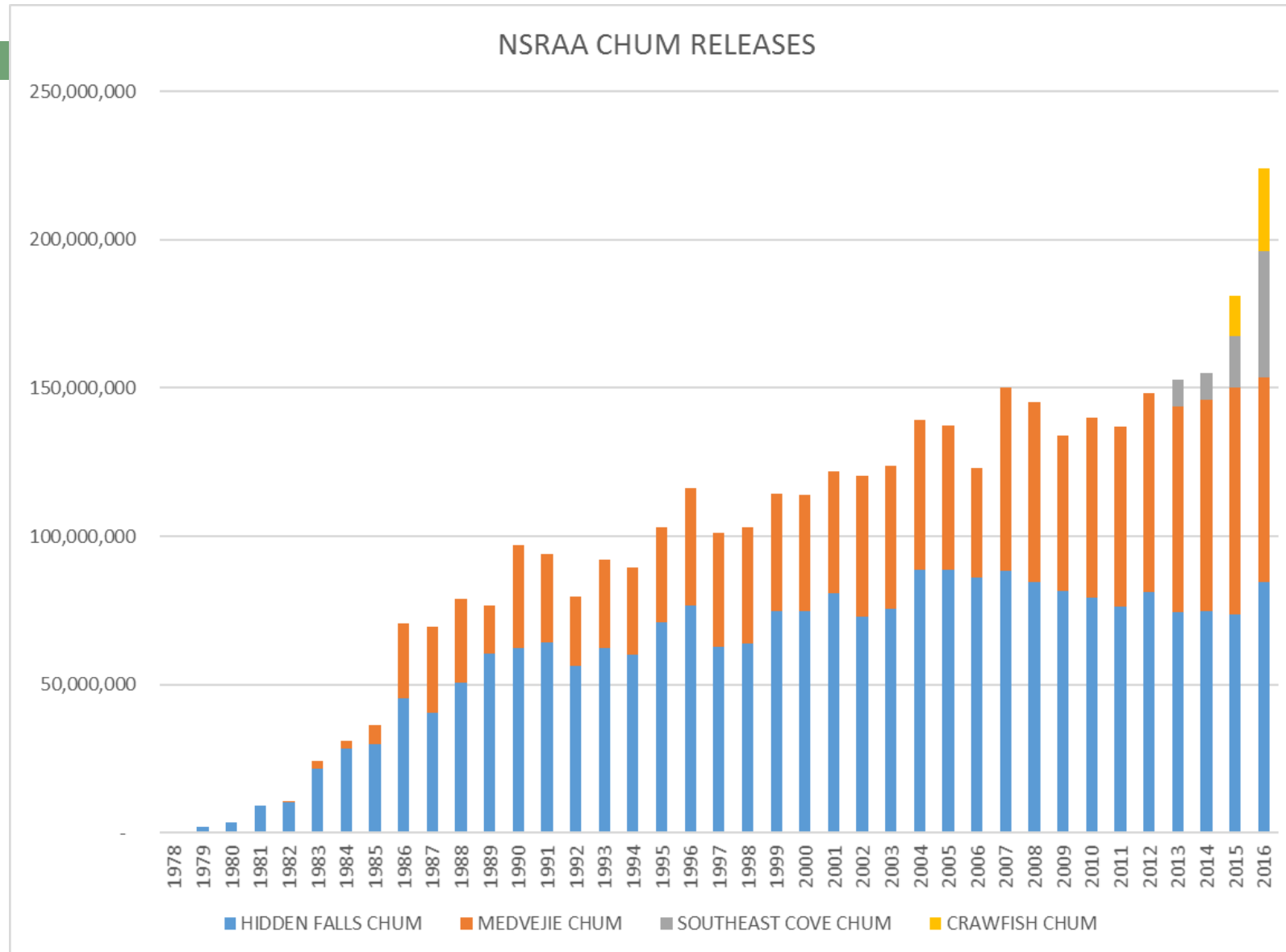
SEC = Southeast Cove  
 CRAW = Crawfish Inlet  
 OPER = Operations Budget  
 CIP = Capital Budget



Annual 2% inflation and 2.5% cost of living increases applied

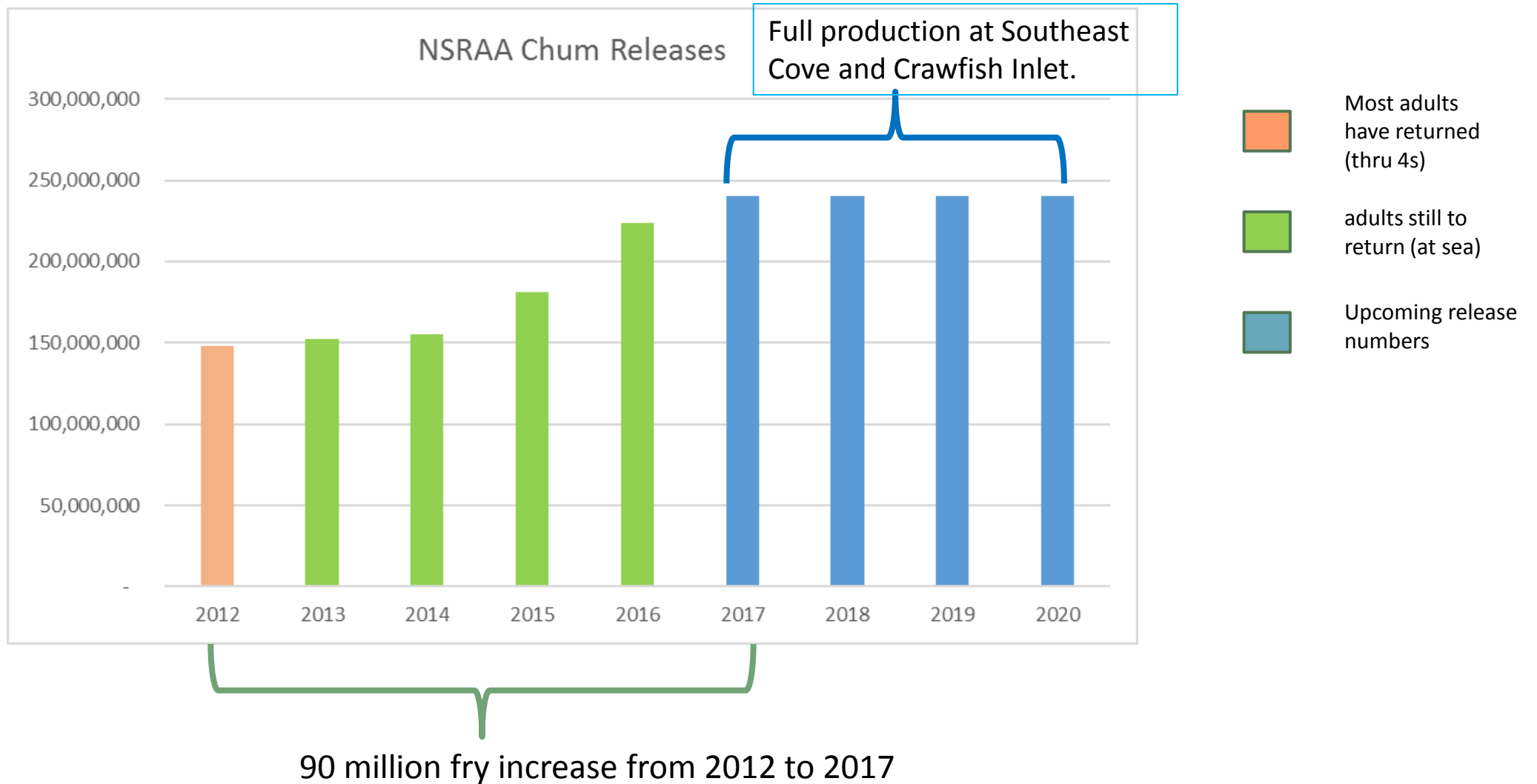
Value estimates are based on 7.8 pound weight, \$0.65 price/pound, 2.5% marine survival.

# NSRAA Chum Releases





# NSRAA Chum Releases



# NSRAA Chum Revenue projections

- With the increase in chum production comes an increase in revenue.
- The following slides look at some possible scenarios for cost recovery and commercial value over the upcoming five years.
- All scenarios use a value of \$5 million in cost recovery revenue required per year.
- Scenarios progress from “Worst Case” to better cases reflecting what we might see with a turnaround at Hidden Falls.

# NSRAA Chum Revenue projections

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- Cost recovery needs from Chum are set at \$5 million per year
- Prices used are \$0.75 per pound for cost recovery and \$0.60 per pound for commercial. A 7.5 pound average weight is used.

# NSRAA Chum Adults – 1. “Worst Case” - Fish

## NSRAA CHUM

### MARINE SURVIVAL

	0.50%	1.0%	1.0%	1.0%	
Return Year	HFH	MED/DI	SEC	CRAW	TOTAL
2016	273,000	1,629,000	149,500	-	2,051,500
2017	373,470	710,861	91,671	13,370	1,189,373
2018	371,103	741,533	152,332	108,016	1,372,984
2019	404,540	718,992	345,608	233,876	1,703,017
2020	434,055	732,137	476,102	272,383	1,914,678
2021	440,000	750,000	500,000	270,000	1,960,000

### “Worst Case”

Under this scenario, marine survival would remain quite low at Hidden Falls and drop well below current levels for Deep Inlet and Southeast Cove; resulting in poor returns to all sites.

# NSRAA Chum Adults – 1. “Worst Case” - Value

NSRAA CHUM VALUE EST at 1.0% M.S.; HF at 0.5%										
Return Year	wt	CR PRICE	CR REQ	CR FISH	BS FISH	COM FISH	% COMM	wt	COMM PRICE	COMM VALUE
2017	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	20,484	2%	7.5	\$ 0.60	\$ 92,177
2018	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	204,095	15%	7.5	\$ 0.60	\$ 918,427
2019	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	534,128	31%	7.5	\$ 0.60	\$ 2,403,575
2020	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	745,789	39%	7.5	\$ 0.60	\$ 3,356,049
2021	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	791,111	40%	7.5	\$ 0.60	\$ 3,560,000
			\$25,000,000						\$	10,330,229

## “Worst Case”

Under this scenario, marine survival would remain quite low at Hidden Falls and drop at other sites; resulting in poor returns to all sites. Cost Recovery revenue needs could be met, with reduced commercial revenue.

# NSRAA Chum Adults – 2. “HF remains at 0.5%”

## NSRAA CHUM

### MARINE SURVIVAL

	0.50%	2.0%	2.0%	2.0%	
Return Year	HFH	MED/DI	SEC	CRAW	TOTAL
2016	273,000	1,629,000	149,500	-	2,051,500
2017	373,470	1,421,722	183,342	26,741	2,005,275
2018	371,103	1,483,066	304,665	216,032	2,374,865
2019	404,540	1,437,985	691,216	467,753	3,001,494
2020	434,055	1,464,275	952,205	544,765	3,395,300
2021	440,000	1,500,000	1,000,000	540,000	3,480,000

“HF remains at 0.5% marine survival”

Under this scenario, marine survival would remain quite low at Hidden Falls and is set at 2% for other sites; resulting in improved returns to other sites from those in scenario #1.

# NSRAA Chum Adults – 2. “HF remains at 0.5%”

NSRAA CHUM VALUE EST at 2.0% M.S.; HF at 0.5%											
Return Year	wt	CR PRICE	CR REQ	CR FISH	BS FISH	COM FISH	% COMM	wt	COMM PRICE	COMM VALUE	
2017	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	836,386	42%	7.5	\$ 0.60	\$ 3,763,737	
2018	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	1,205,976	51%	7.5	\$ 0.60	\$ 5,426,893	
2019	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	1,832,605	61%	7.5	\$ 0.60	\$ 8,246,721	
2020	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,226,411	66%	7.5	\$ 0.60	\$ 10,018,850	
2021	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,311,111	66%	7.5	\$ 0.60	\$ 10,400,000	
			\$25,000,000							\$	37,856,202

“HF remains at 0.5% marine survival”

Under this scenario, marine survival would remain quite low at Hidden Falls, is set at 2% for other sites; Cost Recovery revenue needs would be met, with improved commercial revenue.

# NSRAA Chum Adults – 3. “HF improves to 1%”

## NSRAA CHUM

### MARINE SURVIVAL

	1.0%	2.0%	2.0%	2.0%	
Return Year	HFH	MED/DI	SEC	CRAW	TOTAL
2016	273,000	1,629,000	149,500	-	2,051,500
2017	746,941	1,421,722	183,342	26,741	2,378,745
2018	742,205	1,483,066	304,665	216,032	2,745,968
2019	809,080	1,437,985	691,216	467,753	3,406,033
2020	868,111	1,464,275	952,205	544,765	3,829,355
2021	880,000	1,500,000	1,000,000	540,000	3,920,000

“HF improves to 1 % marine survival”

Under this scenario, marine survival would improve at Hidden Falls with 2% for other sites; resulting in improved overall returns.



# NSRAA Chum Adults – 3. “HF improves to 1%”

NSRAA CHUM VALUE EST at 2.0% M.S.; HF at 1.0%										
Return Year	wt	CR PRICE	CR REQ	CR FISH	BS FISH	COM FISH	% COMM	wt	COMM PRICE	COMM VALUE
2017	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	1,209,856	51%	7.5	\$ 0.60	\$ 5,444,353
2018	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	1,577,079	57%	7.5	\$ 0.60	\$ 7,096,855
2019	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,237,145	66%	7.5	\$ 0.60	\$ 10,067,150
2020	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,660,466	69%	7.5	\$ 0.60	\$ 11,972,099
2021	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,751,111	70%	7.5	\$ 0.60	\$ 12,380,000
			\$25,000,000							\$ 46,960,457

“HF improves to 1% marine survival”

Under this scenario, marine survival would improve at Hidden Falls; is set at 2% for other sites; Cost Recovery revenue needs would be met, with improved commercial revenue.

# NSRAA Chum Adults – 4. “5-yr avg. survival”

## NSRAA CHUM

### MARINE SURVIVAL

	0.9%	2.7%	2.7%	2.7%	
Return Year	HFH	MED/DI	SEC	CRAW	TOTAL
2016	273,000	1,629,000	149,500	-	2,051,500
2017	672,246	1,919,324	247,512	36,100	2,875,183
2018	667,985	2,002,139	411,297	291,643	3,373,064
2019	728,172	1,941,280	933,142	631,466	4,234,059
2020	781,299	1,976,771	1,285,476	735,433	4,778,980
2021	792,000	2,025,000	1,350,000	729,000	4,896,000

“5-yr avg. marine survival”

Under this scenario, marine survivals are set at 5-yr average – with Deep Inlet average used for new projects.

# NSRAA Chum Adults – 4. “5-yr avg. survival”

NSRAA CHUM VALUE EST at 2.7% M.S.; HF at 0.9%

Return Year	wt	CR PRICE	CR REQ	CR FISH	BS FISH	COM FISH	% COMM	wt	COMM PRICE	COMM VALUE
2017	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	1,706,294	59%	7.5	\$ 0.60	\$ 7,678,323
2018	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,204,175	65%	7.5	\$ 0.60	\$ 9,918,789
2019	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	3,065,170	72%	7.5	\$ 0.60	\$ 13,793,267
2020	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	3,610,091	76%	7.5	\$ 0.60	\$ 16,245,410
2021	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	3,727,111	76%	7.5	\$ 0.60	\$ 16,772,000
			\$25,000,000							\$ 64,407,788

“5-yr average”

Under this scenario, marine survivals are set at 5-yr average – with Deep Inlet average used for new projects.

# NSRAA Chum Adults – 5. “Optimistic”

## NSRAA CHUM

### MARINE SURVIVAL

	2.0%	3.0%	3.0%	3.0%	
Return Year	HFH	MED/DI	SEC	CRAW	TOTAL
2016	273,000	1,629,000	149,500	-	2,051,500
2017	1,493,881	2,132,583	275,014	40,111	3,941,588
2018	1,484,410	2,224,599	456,997	324,048	4,490,054
2019	1,618,159	2,156,977	1,036,824	701,629	5,513,590
2020	1,736,221	2,196,412	1,428,307	817,148	6,178,088
2021	1,760,000	2,250,000	1,500,000	810,000	6,320,000

### “Optimistic”

Under this scenario, marine survivals are set at 2% for Hidden Falls and 3% for other projects.

# NSRAA Chum Adults – 5. “Optimistic”

NSRAA CHUM VALUE EST at 3.0% M.S.; HF at 2.0%

Return Year	wt	CR PRICE	CR REQ	CR FISH	BS FISH	COM FISH	% COMM	wt	COMM PRICE	COMM VALUE
2017	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	2,772,699	70%	7.5	\$ 0.60	\$ 12,477,146
2018	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	3,321,165	74%	7.5	\$ 0.60	\$ 14,945,243
2019	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	4,344,701	79%	7.5	\$ 0.60	\$ 19,551,155
2020	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	5,009,199	81%	7.5	\$ 0.60	\$ 22,541,397
2021	7.5	\$ 0.75	\$ 5,000,000	888,889	280,000	5,151,111	82%	7.5	\$ 0.60	\$ 23,180,000
			\$ 25,000,000							\$ 92,694,941

## “Optimistic”

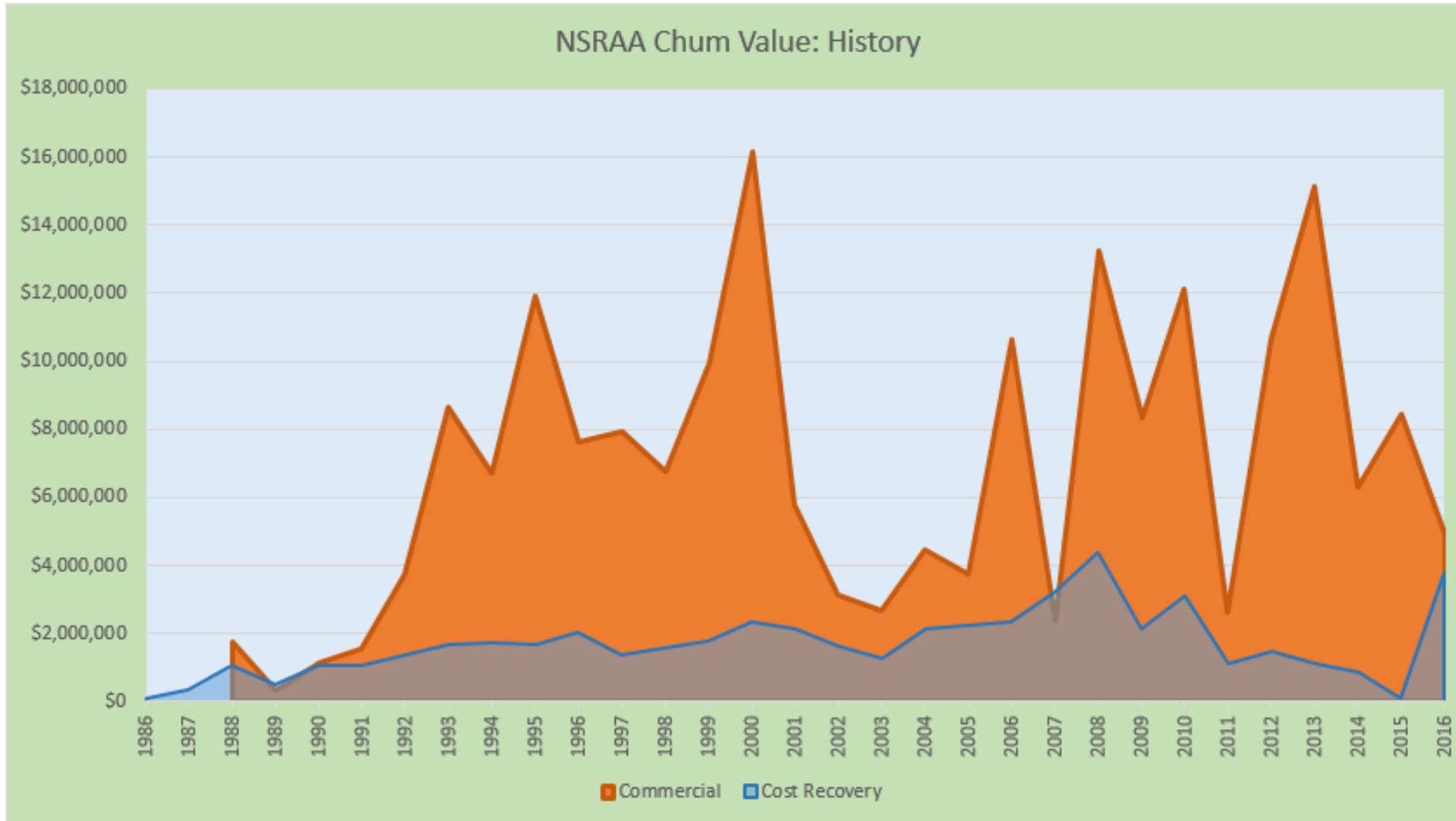
Under this scenario, marine survivals are set at 2.0% for Hidden Falls and slightly above the Deep Inlet 5-yr average for other projects – at 3.0%.

# Graphs

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- The following graphs show value history and possible scenarios for the upcoming 5 years.
- While Hidden Falls continues to struggle, the addition of Southeast Cove and Crawfish Inlet production should add increasing numbers of chum over the period. In addition to the new production, our 4.0 programs are doing quite well; we are hopeful that chum returns and value will increase significantly in upcoming years.

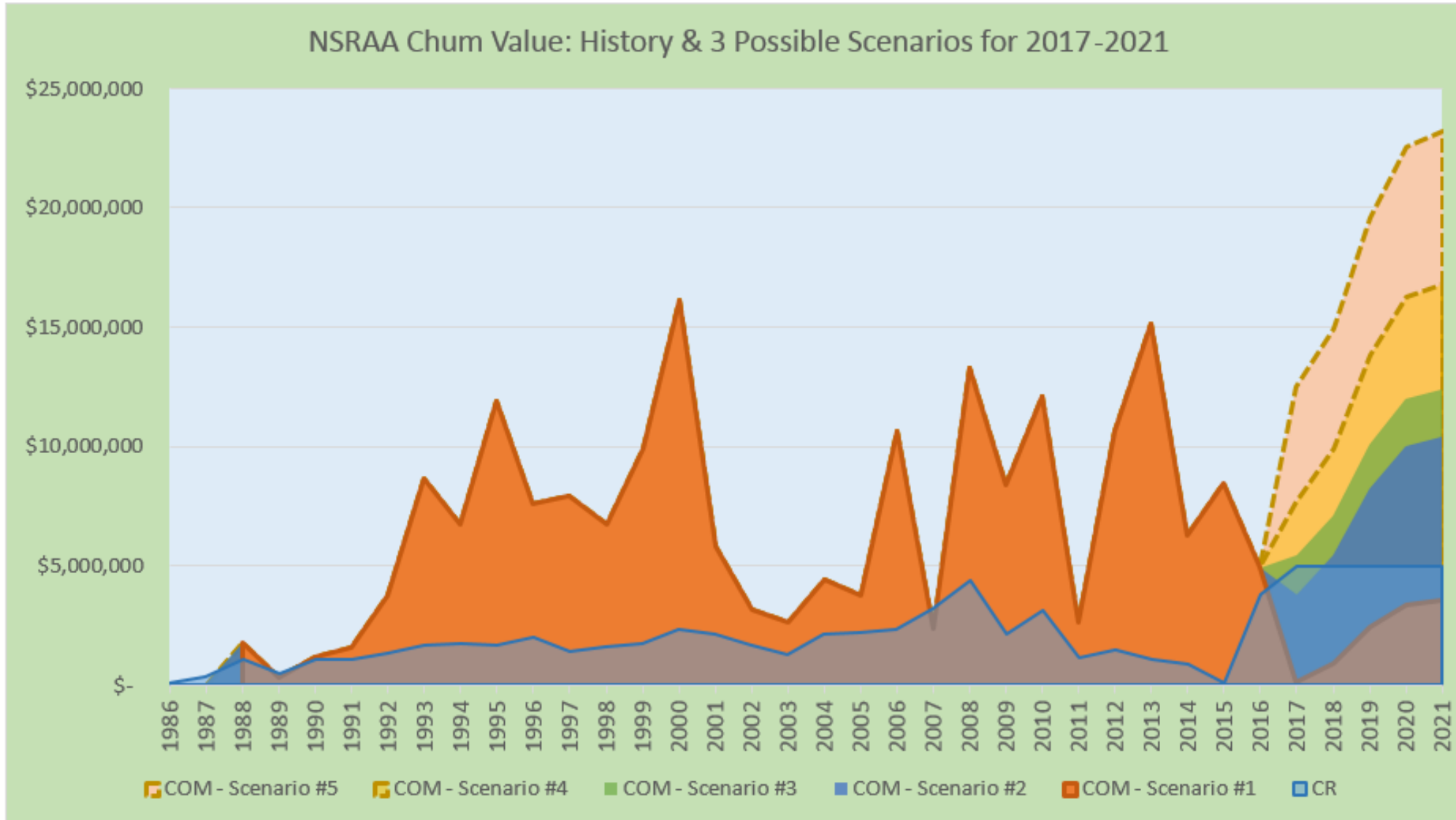
# NSRAA Chum Value



History of NSRAA Chum Value. Commercial and cost recovery are shown. Cost recovery includes revenue from Hidden Falls Tax Assessment.

# NSRAA Chum Value

Possible value scenarios as production from Southeast Cove and Crawfish Inlet are added.



Scenario #5

Scenario #4

Scenario #3

Scenario #2

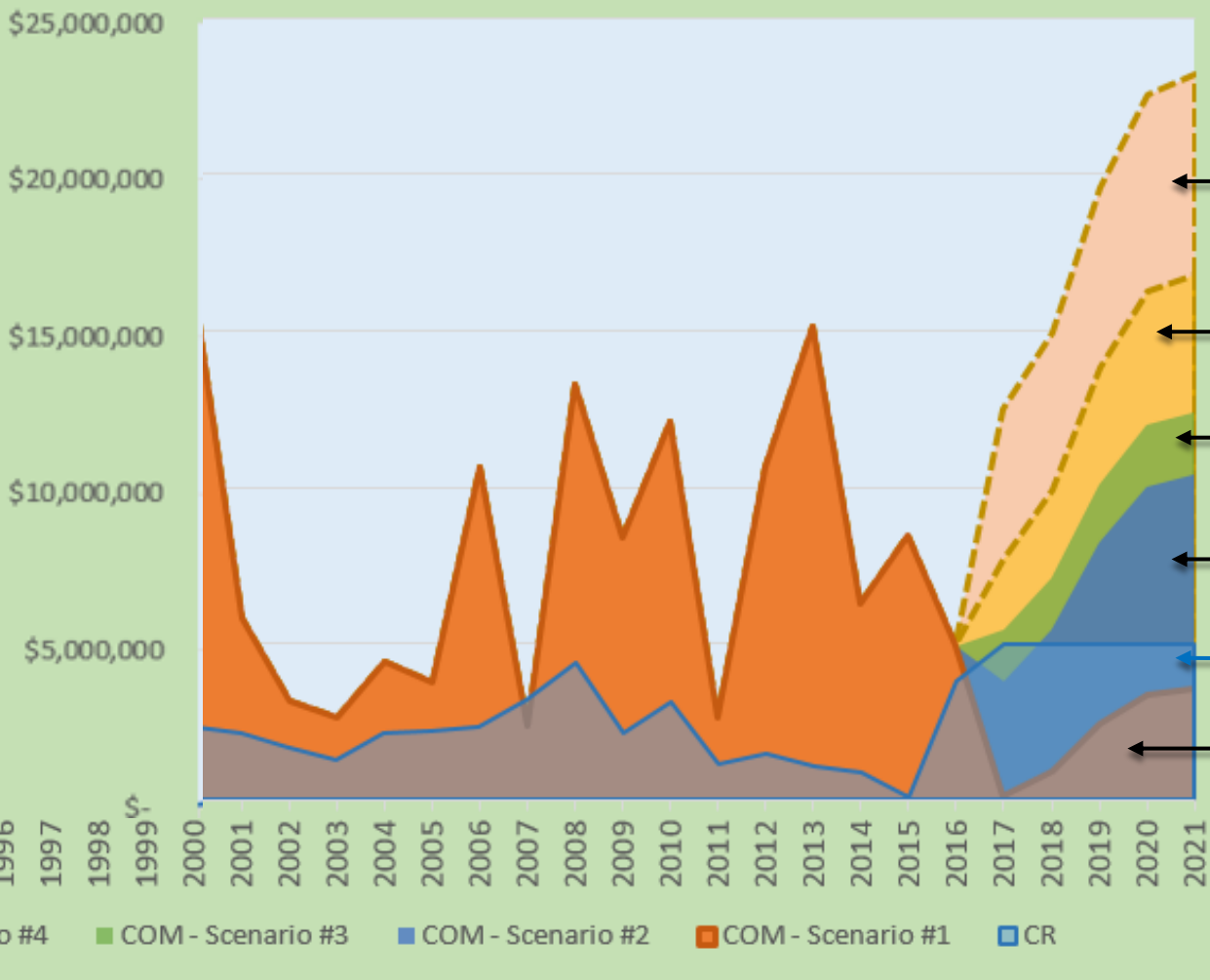
Scenario #1



# NSRAA Chum Value

Possible value scenarios – based on marine survival rates - as production from Southeast Cove and Crawfish Inlet are added.

Value: History & 3 Possible Scenarios for 2017-2021



Scenario #5 Hidden Falls 2% marine survival; other projects 3%  
Hidden Falls rebounds from recent lows; other projects at moderately higher survival rates.

Scenario #4 Hidden Falls .9% marine survival; other projects 2.7%  
These are 5-yr average marine survival rates.

Scenario #3 Hidden Falls 1.0% marine survival; other projects 2.0%

Scenario #2 Hidden Falls 0.5% marine survival; other projects 2.0%

Cost Recovery set at \$5 million per year for all scenarios

Scenario #1 Hidden Falls .5% marine survival; other projects 1.0% All programs have extremely low survival rates. "Worst Case" scenario.

# Data files

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NSRAA RELEASE HISTORY thru 2016 w chum rev projections.xlsx  
location: O:\Chip Data\Web Data Subsite\NSRAA Value

2013 pro forma model SE Cove -Crawfish2016 update.xlsx