Version 2 – Updated with Scallop Committee Input

DRAFT

SCALLOP ACL FLOWCHART DISCUSSION PAPER

June 1~~May 20~~, 2016

Version 2

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2.0 DRAFT PROBLEM STATEMENT

The current ACL structure and fishery allocations in the Scallop FMP are not spatially explicit. Annual catch limits (ACLs) in the scallop fishery are based on scallop biomass in all areas, including closed areas, while. pProjected landings are limited to areas that are open to the fishery in a given year. This can be problematic because the overall scallop management program is an area based system that is spatially explicit. The disconnect between the catch limits and projected landings is more of an issue when higher levels of total biomass are in closed areas and not available to the fishery.

Additionally, measures adopted during and since Amendment 15 have introduced the potential for management uncertainty. The scallop PDT identified several sources of management uncertainty in A15. These include mortality from carry-over allowances, vessel upgrades, ability of the FMP to monitor and enforce all catch, and changes in fishing behavior that may increase landings above projected values. An example of a change made through A15 is that the LAGC IFQ component is now allowed to carryover up to 15% of allocated quota from one fishing year to the next.

3.0 BACKGROUND

3.1 AMENDMENT 11

Amendment 11 implemented limited entry for three LAGC permit categories: LAGC IFQ, LAGC NGOM, and LAGC Incidental. Separate TACs were developed for the NGOM and Incidental permits, but the IFQ TAC is part of the scallop fishery TAC the limited access vessels work under as well.

Staff will insert some background about the allocation decisions and rationale from A11

3.2 AMENDMENT 15

Amendment 15 (A15) was developed to bring the Scallop FMP in compliance with new requirements to end and prevent overfishing using annual catch limits (ACLs) and accountability measures (AMs) (reauthorization of the Magnuson Stevens Act in 2007). To do so, A15 included several terms and definitions which are relevant to the ACL flowchart (Table 1). The scallop fishery uses an overall approach of OFL > ABC = ACL > ACT.

For the Scallop FMP, annual catch limits are based on scallop biomass that is exploitable to survey gear (40mm+). The biomass from all areas, including closed areas, is included in the OFL, ABC, and ACLs for the fishery. Therefore, the allocation split from Amendment 11 is still carried over under this FMP, but it is made at the ACL level, not the projected catch level. The LA fishery receives 94.5% of the ACL and the LAGC IFQ fishery receives 5.5% of the ACL, after set-asides and discard estimates have been removed. Amendment 15 was explicit that the allocation decision should be made at the ACL level, before buffers for management uncertainty are applied. Therefore, the allocation split occurs at the ACL level, and no longer at the projected catch level, as it was under Amendment 11.

Figure 1 the current ACL structure, while Figure 2 depicts how allocations are derived from projected landings using LA open area DAS as an example. As the ACL is not spatially explicit, when projected landing are below the ACL and ACT actual allocations may correspond to lower F rates for the fishery.

Table 1 - Relevant Terms and Definitions (also see A15 p.69). Values updated from SARC 59 (2014).

Term	Definition	Value for Scallop FMP
Maximum Sustainable Yield (MSY)	Largest long-term average catch or yield. Results from applying F_{msy}.	$F_{msy} = F_{max} = 0.48$
Status Determination Criteria (SDC)	Quantifiable factors used to determine if overfishing has occurred and if stock is overfished	SDC for Scallop FMP is $F_{threshold}$ of 0.48 and $B_{threshold}$ of 48,240 mt, meats.
Maximum Fishing Mortality Threshold (MFMT)	Level of fishing mortality above which overfishing is occurring.	MFMT = $F_{threshold} = 0.48$
Minimum Sustainable Stock Threshold (MSST)	Level of biomass below which stock is considered overfished.	MSST = $B_{threshold}$ = ½ *Bmsy* = 48,240 (*mt, meats*)
Overfishing Limit (OFL)	Annual amount of catch above which overfishing is occurring, results from applying MFMT or $F_{threshold}$ to stock abundance.	OFL
Optimum Yield (OY)	MSY reduced by relevant social, economic, and ecological factors.	OY = ACL
Acceptable Biological Catch (ABC)	Maximum catch recommended for harvest. Can never exceed OFL and should consider scientific uncertainty.	ABC set 25% lower than OFL (SSC recommendation)
Annual Catch Limit (ACL)	Annual amount of catch over which accountability measures triggered. ACL can equal but never exceed ABC	ABC = ACL
Sector ACL	Overall ACL can be divided into sub-ACLs if differences in degree of management uncertainty.	Scallop FMP will have 2 sub-ACLs: one for limited access (LA) and one for limited access general category fishery (LAGC). ACL = LA ACL + LAGC ACL
Annual Catch Target (ACT)	Amount of annual catch that is the management target and accounts for management uncertainty.	Scallop FMP will have 2 ACTs: LA ACT will be set at F level with 25% chance of exceeding ABC and LAGC ACT will be set equal to LAGC sub-ACL.

Figure 1 - Current OFL/ABC/ACL flowchart process

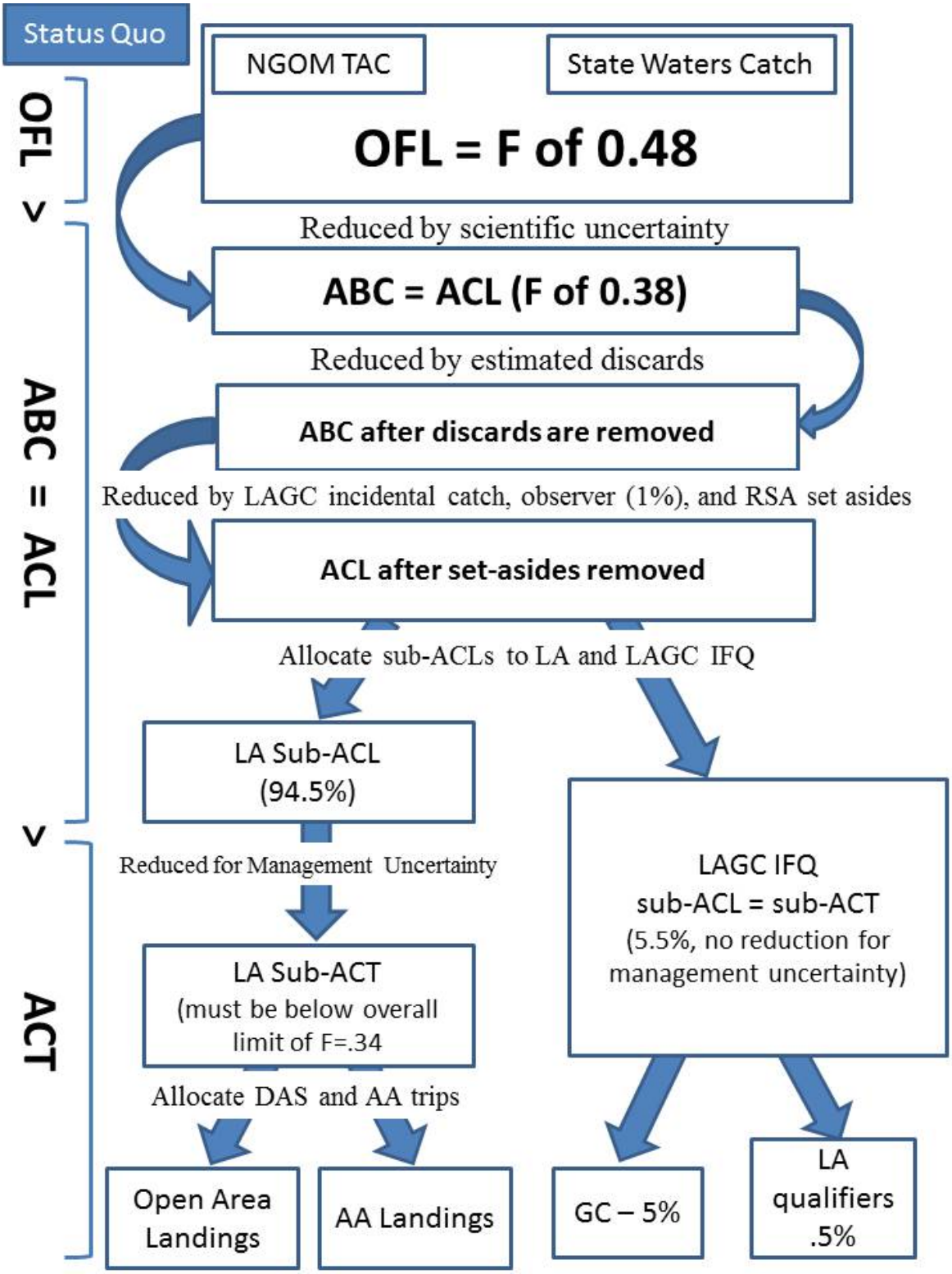
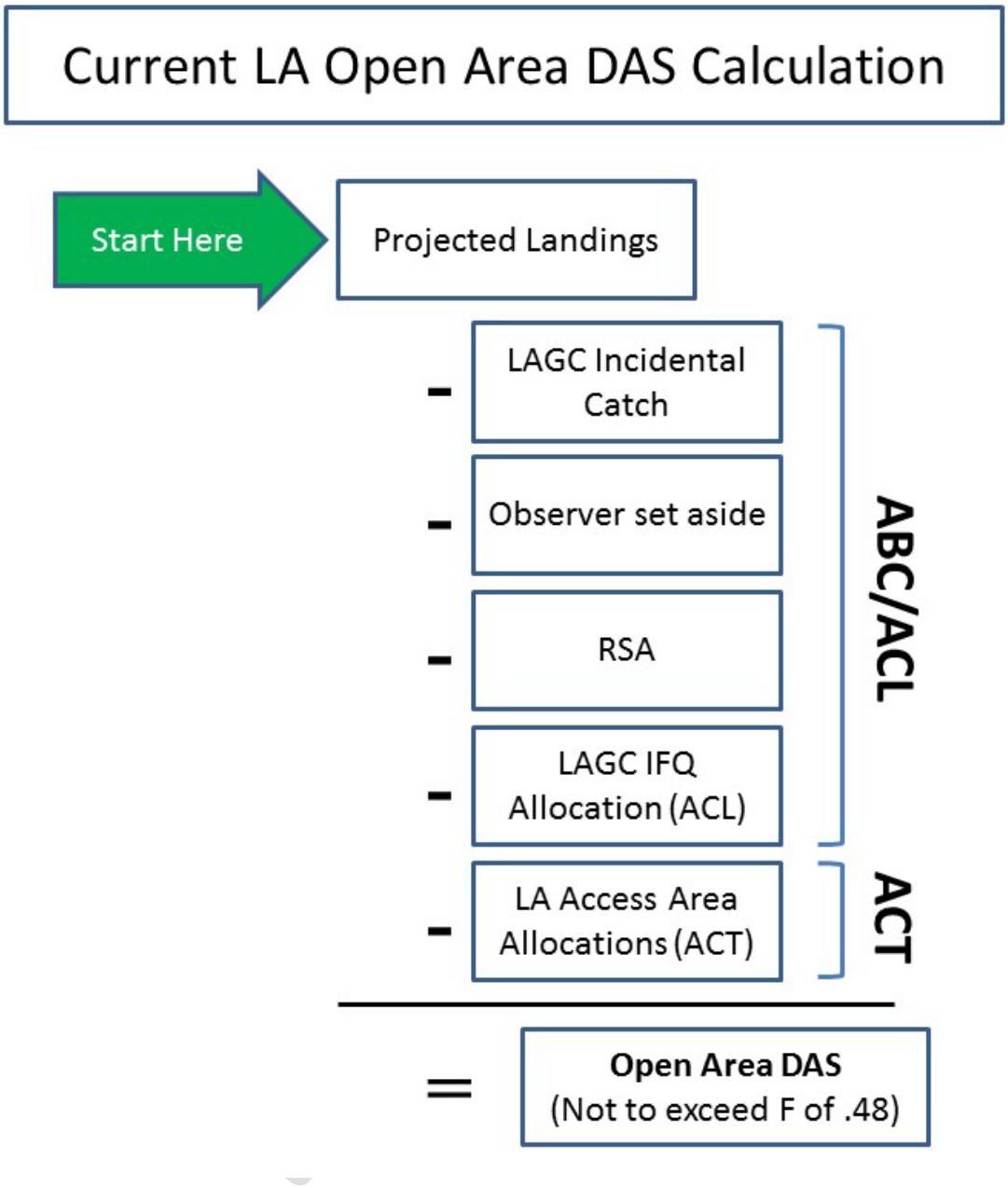


Figure 2 - Current method used to calculate LA open area DAS



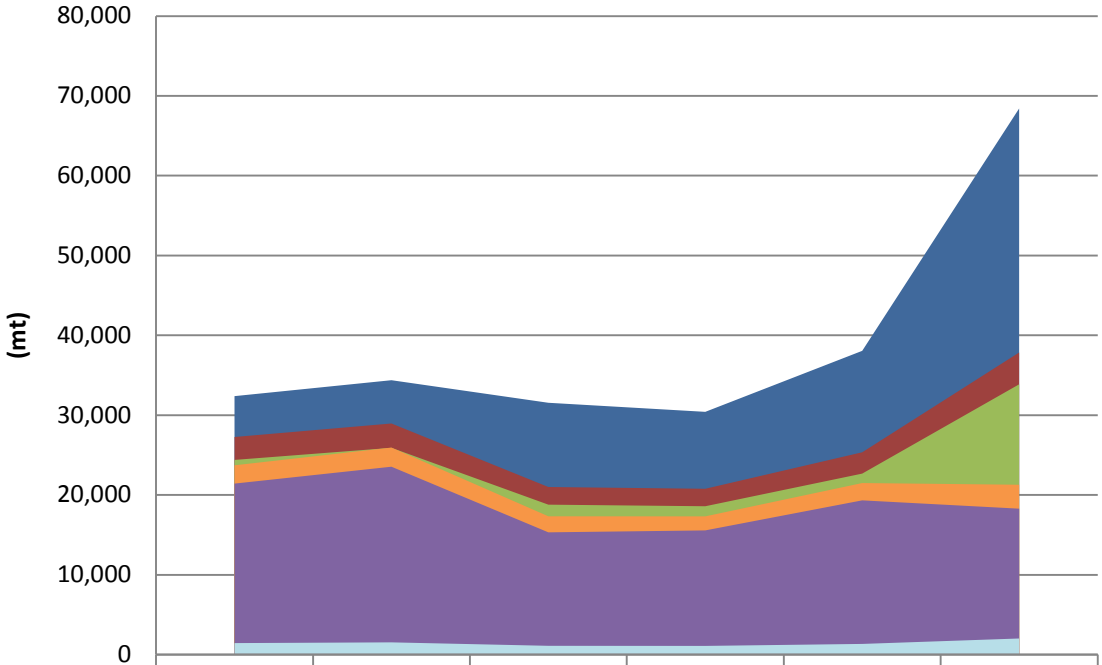
3.3 PERFORMANCE TO DATE

Table 2 - Performance of ACL management to date. FY 2015 landings (actual mt, lb) are estimates.

		Allocated		% of Total Allocated	Actual		% Difference (allocated vs actual)	% of Total Actual
		mt	lb		mt	lb		
2011	OFL	32,387	71,401,113					81.88%
	ABC/ACL	27,269	60,117,854					97.24%
	Total Projected Landings	23,723	52,300,000		26,518	58,461,465	112%	
	incidental	23	50,000	0.10%	18	38,700	77%	0.07%
	RSA	567	1,250,000	2.39%	553	1,218,781	98%	2.08%
	OBS	273	601,170	1.15%	104	228,370	38%	0.39%
	IFQ	1,452	3,201,880	6.12%	1,382	3,046,245	95%	5.21%
	LA ACT	21,431	47,247,267	90.34%	24,462	53,929,369	114%	92.25%
	LA ACL	24,954	55,014,153		24,462	53,929,369		
2012	OFL	34,382	75,799,335					75.33%
	ABC/ACL	28,961	63,848,076					89.43%
	Total Projected Landings	25,945	57,200,000		25,900	57,098,684	100%	
	incidental	23	50,000	0.09%	28	61,869	124%	0.11%
	RSA	567	1,250,000	2.19%	529	1,167,316	93%	2.04%
	OBS	290	638,470	1.12%	120	263,700	41%	0.46%
	IFQ	1,544	3,405,000	5.95%	1,511	3,331,284	98%	5.83%
	LA ACT	23,546	51,910,044	90.75%	23,711	52,274,515	101%	91.55%
	LA ACL	26,537	58,503,960					
2013	OFL	31,555	69,566,867					57.22%
	ABC/ACL	21,004	46,305,894					85.97%
	Total Projected Landings	17,335	38,216,741		18,056	39,807,589	104%	
	incidental	23	50,000	0.13%	21	47,337	95%	0.12%
	RSA	567	1,250,000	3.27%	553	1,218,204	97%	3.06%
	OBS	210	463,059	1.21%	174	384,545	83%	0.97%
	IFQ	1,111	2,449,856	6.41%	1,095	2,414,256	99%	6.06%
	LA ACT	15,324	33,783,637	88.40%	16,213	35,743,247	106%	89.79%
	LA ACL	19,093	42,092,979		16,213	35,743,247		
2014	OFL	30,419	67,062,415		0			47.75%
	ABC/ACL	20,782	45,816,467		0			69.89%
	Total Projected Landings	17,327	38,463,656		14,524	32,020,980	83%	
	incidental	23	50,000	0.13%	19	42,107	84%	0.13%
	RSA	567	1,250,000	3.27%	433	954,011	76%	2.98%
	OBS	208	458,562	1.20%	177	390,579	85%	1.22%
	IFQ	1,099	2,423,145	6.34%	948	2,089,589	86%	6.53%
	LA ACT	15,567	34,319,360	89.84%	12,948	28,544,694	83%	89.14%
	LA ACL	18,885	41,634,305		12,948	28,544,694		

		Allocated		% of Total Allocated	Actual		% Difference (allocated vs actual)	% of Total Actual
		mt	lb		mt	lb		
2015	OFL	38,061	83,910,142					
	ABC/ACL	25,352	55,891,593					
	Total Projected Landings	21,500	47,400,000					
	incidental	23	50,000	0.11%				
	RSA	567	1,250,021	2.64%				
	OBS	254	559,974	1.18%	220	484,955	87%	
	IFQ	1,348	2,971,831	6.27%	1,161	2,559,595	86%	
	LA ACT	19,331	42,617,560	89.91%	14,317	31,564,479	74%	
	LA ACL	23,161	51,061,265					
2016	OFL	68,418	150,835,870					
	ABC/ACL	37,852	83,449,375					
	Total Projected Landings	21,288	46,932,006					
	incidental	23	50,000	0.11%				
	RSA	567	1,250,000	2.66%				
	OBS	379	835,552	1.78%				
	IFQ	2,029	4,473,180	9.53%				
	LA ACT	18,290	40,322,555	85.92%				
	LA ACL	34,855	76,842,135					

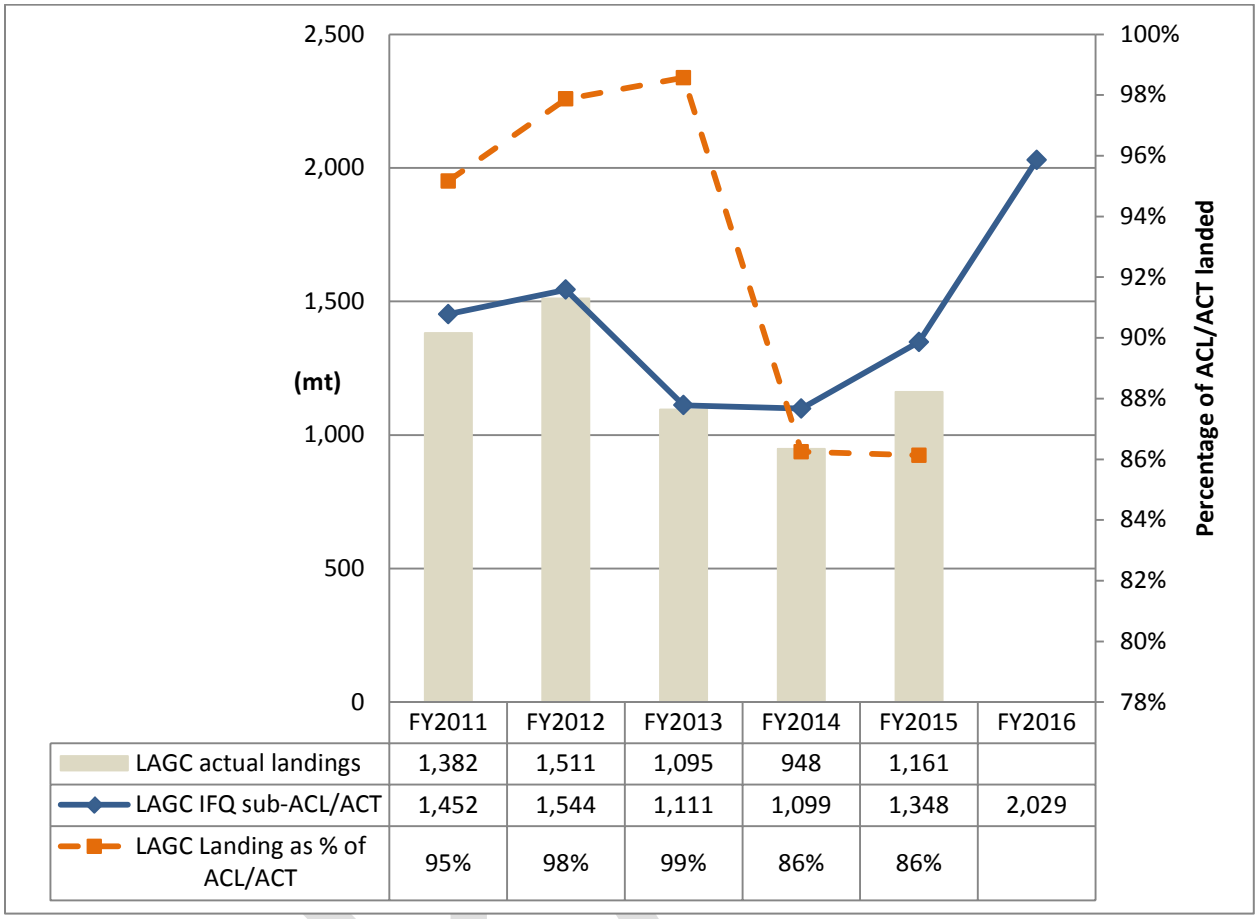
Figure 3 - OFL, ABC/ACL, ACT, and Projected Landing values for FY2011 - 2015. ACT values are approximate. Note the increase in the OFL and the slight decrease in projected landing in FY2016.



	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
OFL at F=0.48	32,387	34,382	31,555	30,419	38,061	68,418
ABC/ACL at F=0.38	27,269	28,961	21,004	20,782	25,352	37,852
ACT at F=0.34	24,399	25,912	18,793	18,594	22,683	33,868
Projected Landings	23,723	25,945	17,335	17,327	21,500	21,288
LA sub-ACT	21,431	23,546	15,324	15,567	19,331	18,290
LAGC IFQ sub-ACL	1,452	1,544	1,111	1,099	1,348	2,029

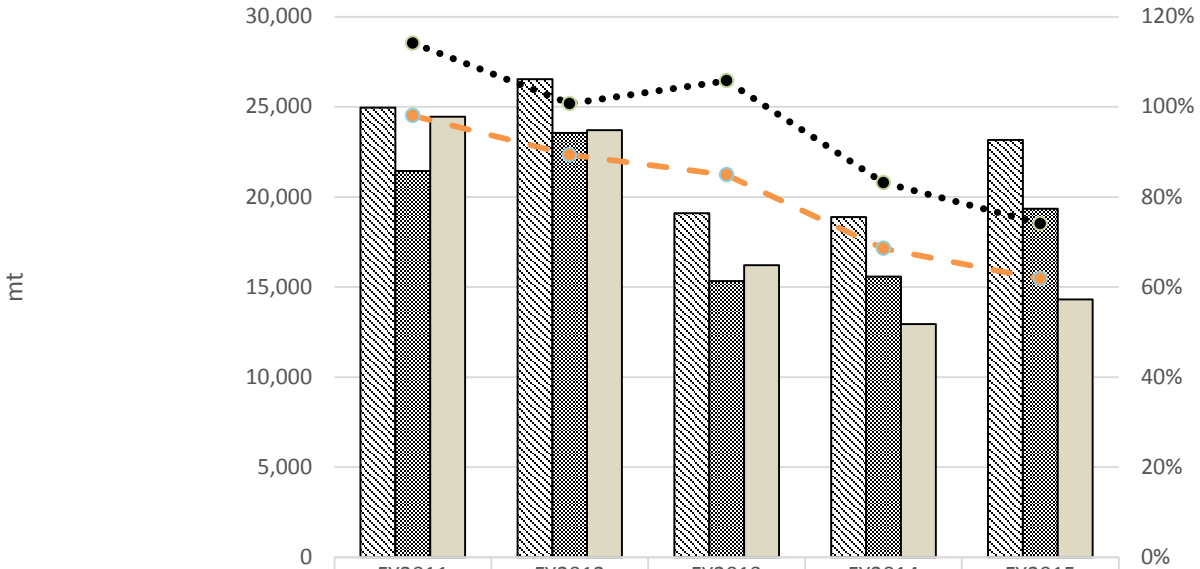
Recent OFL, ABC/ACL, ACT, and projected landing are shown in Figure 3. From FY 2011 – FY 2015, the projected landing and ACT track relatively closely. The disconnect between ACLs based on overall biomass and projected landings described in the problem statement is particularly prevalent in FY 2016 (over 16,000 mt difference).

Figure 4 - Performance of LAGC IFQ landings relative to quotas, FY2011- FY2015.



	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016
LAGC actual landings	1,382	1,511	1,095	948	1,161	
LAGC IFQ sub-ACL/ACT	1,452	1,544	1,111	1,099	1,348	2,029
LAGC Landing as % of ACL/ACT	95%	98%	99%	86%	86%	

Figure 5 - Performance of limited access landings relative to allocations, FY2011 – FY 2015. Note that while the ACT was exceeded in some years, the LA component did not exceed its sub-ACL.-



	FY2011	FY2012	FY2013	FY2014	FY2015
LA sub-ACL	24,954	26,537	19,093	18,885	23,161
LA sub-ACT	21,431	23,546	15,324	15,567	19,331
LA actual landings	24,462	23,711	16,213	12,948	14,317
LA Landings as % of ACT	114%	101%	106%	83%	74%
LA Landings as % of ACL	98%	89%	85%	69%	62%

4.0 DRAFT OBJECTIVES

The annual catch limits for the LA and LAGC fisheries are consistent with decisions made in Amendment 11 (94.5% to the LA fishery and 5.5% to the LAGC fishery). However, under the current ACL structure the LA fishery allocations (DAS and allocations in access areas) are constrained by the available biomass from areas that are open, while the LAGC fishery allocation is based on available biomass from all areas. This disconnect between the catch limits and fishery allocations is more of an issue when more biomass is in closed areas and not available to the fishery. For example, in 2015 and 2016 a large proportion of total biomass was within EFH and GF closed areas as well as very large year classes of small scallops closed within scallop access areas.

As noted in the problem statement, measures adopted during and since Amendment 15 have introduced the potential for management uncertainty. Several sources of management uncertainty were identified by the PDT in A15.

An action could be developed to address these issues. The alternatives could be developed based on the draft objectives below.

1. Consider modifications to the ACL structure to set allocations that account for:
    a. Changes in management during and since A15 (ex: carryover).
    b. Spatial management.
2. Consider r~~R~~educing~~e~~ potential impacts on the resource from allocations that are based on all areas, but are only fished in areas available to the fishery.
3. Consider the performance of fishery catches in both access areas and open areas (for both LA and GC IFQ components), with an emphasis on times/areas where the fishery is under performing (landings below projections).

~~3. Are there other measures that would address the problem statement not related to ACL structure?~~

5.0 DRAFT MEASURES

5.1 MODIFICATIONS TO SCALLOP ACL FLOWCHART

5.1.1 No Action

No changes would be made to the current ACL flowchart process, described in Figure 1.

Rationale: Under the current approach established in Amendment 15, fishery catches have remained below the OFL and ABC while components of the fishery have achieved catch targets in some years.

Cons: This ACL system is not spatially explicit and does not function as well when relatively large amounts of total scallop biomass are in closed areas

5.1.2 Modify ACL Flowchart

5.1.2.1 Option A: Consider a management uncertainty buffer for the LAGC fishery

A management uncertainty buffer would be specified as a percentage of LAGC IFQ sub-ACL.

~~*Staff has identified 10% and 20% management uncertainty buffers for discussion purposes.*~~

- *Option A5%*
- *Option A10%*
- *Option A20%*

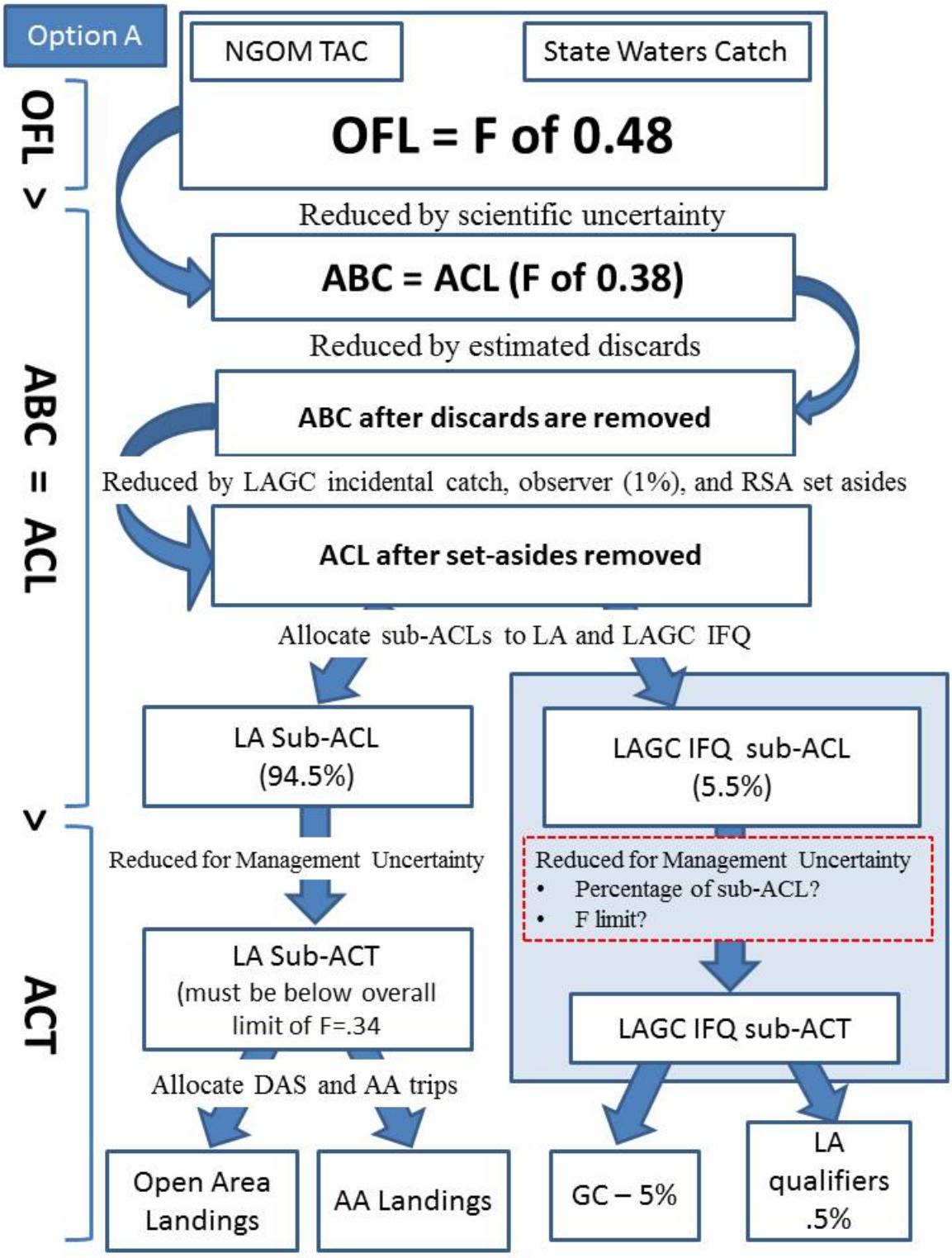
Rationale: Measures adopted during and since Amendment 15 have introduced the potential for management uncertainty. The scallop PDT identified several sources of management uncertainty in A15, which include mortality from carry-over allowances, vessel upgrades, ability of the FMP to monitor and enforce all catch, and changes in fishing behavior that may increase landings above projected values. For example, the LAGC IFQ component is now allowed to carryover up to 15% of allocated quota from one fishing year to the next.

Cons: This modification does not address the spatial nature of the Scallop FMP. LAGC allocation would still be based on percentage of all biomass, in both open and closed areas.

Table 3 – Comparison of LAGC allocations when applying 5%, 10%, and 20% management uncertainty buffers and the mt difference between what the LAGC IFQ sub-ACL would have been if a management buffer were in place and actual landing. A positive value in these columns indicates that landings for the FY were less than the ACL with a management buffer applied. Values in metric tons.

FY	LAGC IFQ sub-ACL	LAGC actual landings	Option A5%		Option A10%		Option A20%	
			sub-ACL with 5% Buffer (mt)	Difference between Option A5% and Actual Landings	sub-ACL with 10% buffer (mt)	Difference between Option A10% and Actual Landings	sub-ACL with 20% buffer (mt)	Difference between Option A20% and Actual Landings
2011	1452	1382	1379	-2	1307	-75	1162	-220
2012	1544	1511	1467	-44	1390	-121	1235	-276
2013	1111	1095	1055	-40	1000	-95	889	-206
2014	1099	948	1044	96	989	41	879	-69
2015	1348	1161	1281	120	1213	52	1078	-83
2016	2029		1928		1826		1623	

Figure 6 – Option A considers a management uncertainty buffer for the LAGC component of the fishery.



5.1.2.2 Option B: Consider modifying ACL structure to incorporate spatial management into catch limits based on projected landing estimates

Spatially explicit approaches would calculate ACLs/ACTs based on projected landings from areas that are open (start allocations with projected landings box at bottom of Figure 7), not to exceed a specified F ceiling (currently F=0.34 for LA, and F=0.38 for LAGC IFQ). The ceiling for either fleet could be modified; the intent is for it to reflect management uncertainty for that fleet.

There are additional approaches that the Council may consider under the umbrella of spatially explicit catch limits, such as requiring harvest of LAGC IFQ access area (AA) quota to be harvested within AAs.

~~*Staff has identified spatially explicit management approaches for discussion purposes.*~~

- Option B – Spatially Explicit approach

Rationale: Basing allocations only on the biomass that is available to the fishery more closely aligns allocations with the available resource; therefore is more spatially explicit. This approach may address situations when a large number of scallops are in EFH and GF closed areas, as well as very large year classes of small scallops closed within scallop access areas.

Cons: Allocations that are not spatially explicit may have a higher risk of higher fishing rates than target levels since some areas will not be open to the fishery.

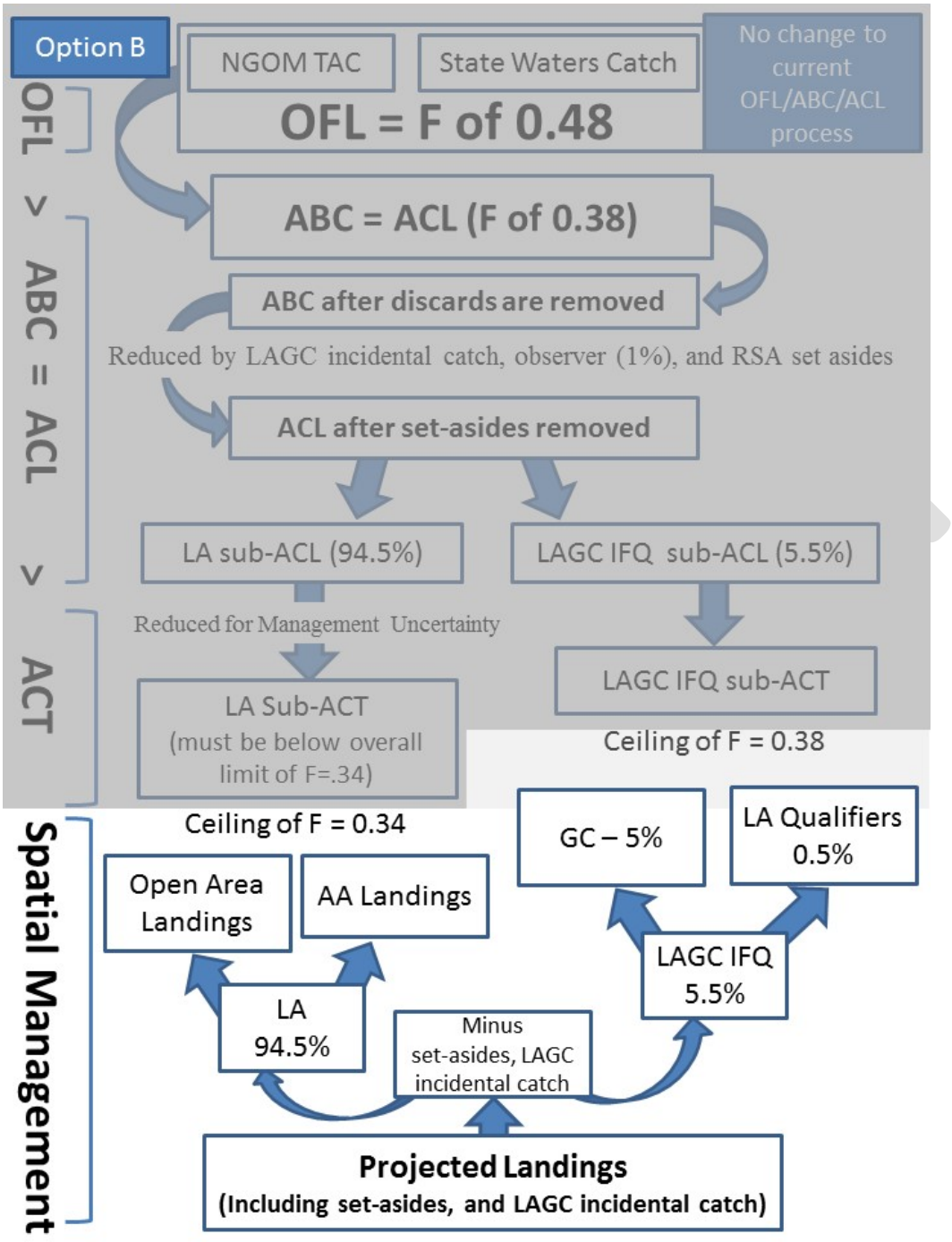
Table 4 - Comparison of LAGC allocations when applying a spatially explicit approach and the mt difference between what the LAGC IFQ sub-ACL would have been using a spatially explicit approach and actual landing. A negative value in indicates that landings for the FY were greater than the ACL using a spatially explicit approach. Values in metric tons.

	LAGC IFQ sub-ACL	LAGC actual landings	LAGC - Option B	Difference between landings and Option B (Opt B - Landings)
FY2011	1452	1382	1257	-124
FY2012	1544	1511	1378	-132
FY2013	1111	1095	908	-186
FY2014	1099	948	907	-40
FY2015	1348	1161	1136	-25
FY2016	2029		1117	

Table 5 - Comparison of LA allocations when applying a spatially explicit approach and the mt difference between what the LA sub-ACL would have been using a spatially explicit approach and actual landing. A negative value in indicates that landings for the FY were greater than the Option B sub-ACT "spatially explicit approach." Values in metric tons.

	LA sub-ACL	LA sub-ACT	LA actual landings	LA - Option B	Difference between Option B and landings (Opt B - Landings)
FY2011	24,954	21,431	24,462	21,603	-2,859
FY2012	26,537	23,546	23,711	23,686	-25
FY2013	19,093	15,324	16,213	15,618	-595
FY2014	18,885	15,567	12,948	15,593	2,645
FY2015	23,161	19,331	14,317	19,520	5,203
FY2016	34,855	18,290		19,201	

Figure 7 – Option B considers modifying the ACL structure to incorporate spatial management into catch limits based on projected landings estimates. There would be no changes to the process for setting the ABC/ACL and OFL.



Under Status Quo the LA sub-ACT has a ceiling of 0.34 and LAGC sub-ACT has a ceiling of 0.38, but those could be adjusted. For example, LAGC sub-ACT could be set lower than 0.38.

5.1.2.3 Comparison of ACL flowchart options

Table 4 and Table 5 illustrate how each option would modify allocations for the LAGC IFQ and LA components of the fishery, respectively. Table 6 shows the percent reduction of for management uncertainty under- Option A-10%, Option A-20%, and Option B when compared to status quo. Option B – as expected – produces the most variable results year to year. The allocation to the LA component increases in all years (1% - 3%) because the LAGC IFQ quota would be based on 5.5% of projected landings (not the ACL).

Table 6 - Comparison of LAGC IFQ allocation values under status quo, Option A, and Option B. Values in metric tons. The sub-ACL and sub-ACT columns are equal, and shown for comparison purposes.

	LAGC IFQ sub-ACL	LAGC IFQ sub-ACT	LAGC - Option A 10%	LAGC - Option A 20%	LAGC - Option B
FY2011	1,452	1,452	1,307	1,162	1,257
FY2012	1,544	1,544	1,390	1,235	1,379
FY2013	1,111	1,111	1,000	889	909
FY2014	1,099	1,099	989	879	908
FY2015	1,348	1,348	1,213	1,078	1,136
FY2016	2,029	2,029	1,826	1,623	1,118

Table 7 - Comparison of LA ACT allocation values under status quo, Option A, and Option B. Values in metric tons.

	LA sub-ACL	LA sub-ACT	LA – Option A 10%	LA – Option A 20%	LA – Option B
FY2011	24,954	21,431	21,431	21,431	21,603
FY2012	26,537	23,546	23,546	23,546	23,686
FY2013	19,093	15,324	15,324	15,324	15,618
FY2014	18,885	15,567	15,567	15,567	15,593
FY2015	23,161	19,331	19,331	19,331	19,520
FY2016	34,855	18,290	18,290	18,290	19,201

Table 8 - Percent reduction from LA and LAGC IFQ sub-ACLs for management uncertainty under status quo, Option A 10%, Option A 20%, and Option B.

	Status Quo		Option A - 10%		Option A - 20%		Option B - Spatially Explicit	
	LA	LAGC	LA	LAGC	LA	LAGC	LA	LAGC
FY2011	-14%	0%	-14%	-10%	-14%	-20%	-13%	-15%
FY2012	-11%	0%	-11%	-10%	-11%	-20%	-11%	-12%
FY2013	-20%	0%	-20%	-10%	-20%	-20%	-18%	-22%
FY2014	-18%	0%	-18%	-10%	-18%	-20%	-17%	-21%
FY2015	-17%	0%	-17%	-10%	-17%	-20%	-16%	-19%
FY2016	-48%	0%	-48%	-10%	-48%	-20%	-45%	-82%

5.2 OTHER POTENTIAL MEASURES

5.2.1.1 Consider modifying how the observer set-aside is removed from the ACL flowchart

By regulation, the observer set-aside is set at 1% of the ACL. As the set-aside is based on biomass in all areas, in some years this set aside is based on resources the fishery does not have access to. The risk of not harvesting the entire set-aside increases relative to the proportion of biomass in closed areas. However, the level of potential observer coverage may be higher if set-aside based on all area biomass, and not just areas available to the fishery. The PDT offers two alternative approaches for calculating the observer set-aside for consideration:

1. Calculate the observer set-aside based on the catch level associated with F=0.34 of the total biomass in all areas, which is the F value associated with the LA component's ACT (rather than at the ABC/ACL at F=0.38). This is not a spatially explicit approach.
2. Calculate the set-asides as part of the projected landings in "Option B" before allocating to the LA and LAGC components. This is a spatially explicit approach.

Figure 8 - Comparison of approaches to setting the observer set-aside, including actual catch by fishing year. Note that the FY2015 bar for actual catch is hatched because data is preliminary.

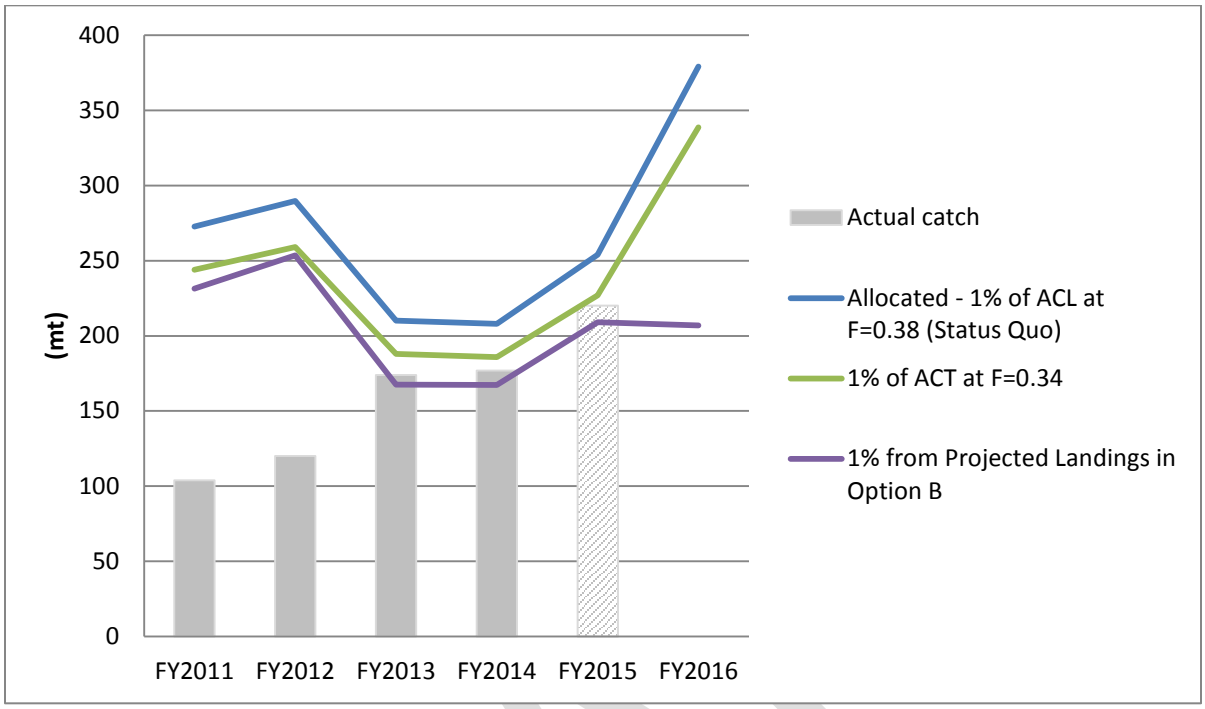


Table 9 – Comparison of approaches to setting the observer set-asides, including actual catch by fishing year.

	Allocated - 1% of ACL at F=0.38 (Status Quo)	Actual catch	1% of ACT at F=0.34	1% from Projected Landings in Option B
FY2011	273	104	244	231
FY2012	290	120	259	254
FY2013	210	174	188	167
FY2014	208	177	186	167
FY2015	254	220	227	209
FY2016	379		339	207

Table 10 - Actual observer landings as a percentage of status quo (1% of ACL) and other potential options.

	Allocated - 1% of ACL at F=0.38 (Status Quo)	1% of ACT at F=0.34	1% from Projected Landings in Option B
FY2011	38%	43%	45%
FY2012	41%	46%	47%
FY2013	83%	93%	104%
FY2014	85%	95%	106%
FY2015	87%	97%	105%

Insert information about performance of observer set-aside to date – comparing projected and realized coverage by permit category and area

6.0 PDT DISCUSSION AND RECOMMENDATIONS

The PDT reviewed an earlier version of this document on its March 9, 2016 conference call and supported forwarding it to the AP and Committee for additional discussion and input. The PDT recommended changes to the ACL flowcharts, suggested clarifications to the objectives section of the document to include recent changes in management. The PDT also identified a handful of additional analyses that would be useful to have for future discussions including a comparison of projected and realized estimates of fishing mortality, and comparison of target and realized observer coverage, etc.