



An update of the IPHC Management Strategy Evaluation (MSE)

Interim Meeting 092

November 2016

Purpose

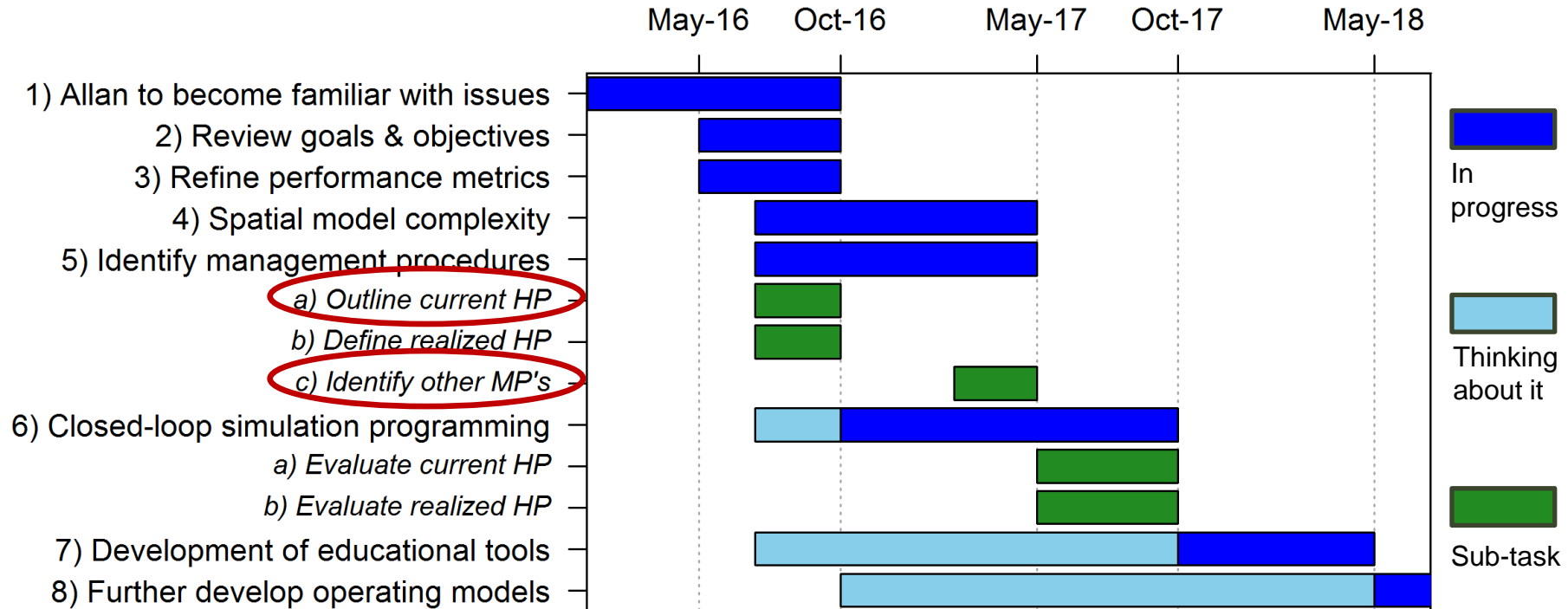
To update the Commission on the task assigned to IPHC staff and the Management Strategy Advisory Board (MSAB) at the 2016 Annual Meeting

Review and provide recommendations for updating the harvest policy and harvest control rules



Background

- A 2-year workplan for MSE development was created



Current harvest policy

- Current harvest policy defines the catch defined by the Blue Line
- Originally designed to meet five goals
 1. avoid very low stock sizes;
 2. mostly avoid low stock sizes (80% of the time);
 3. achieve most of MSY (80% of the time);
 4. reduce variability in catch; and
 5. distribute removals in proportion to the current stock biomass (i.e. preserve biocomplexity).



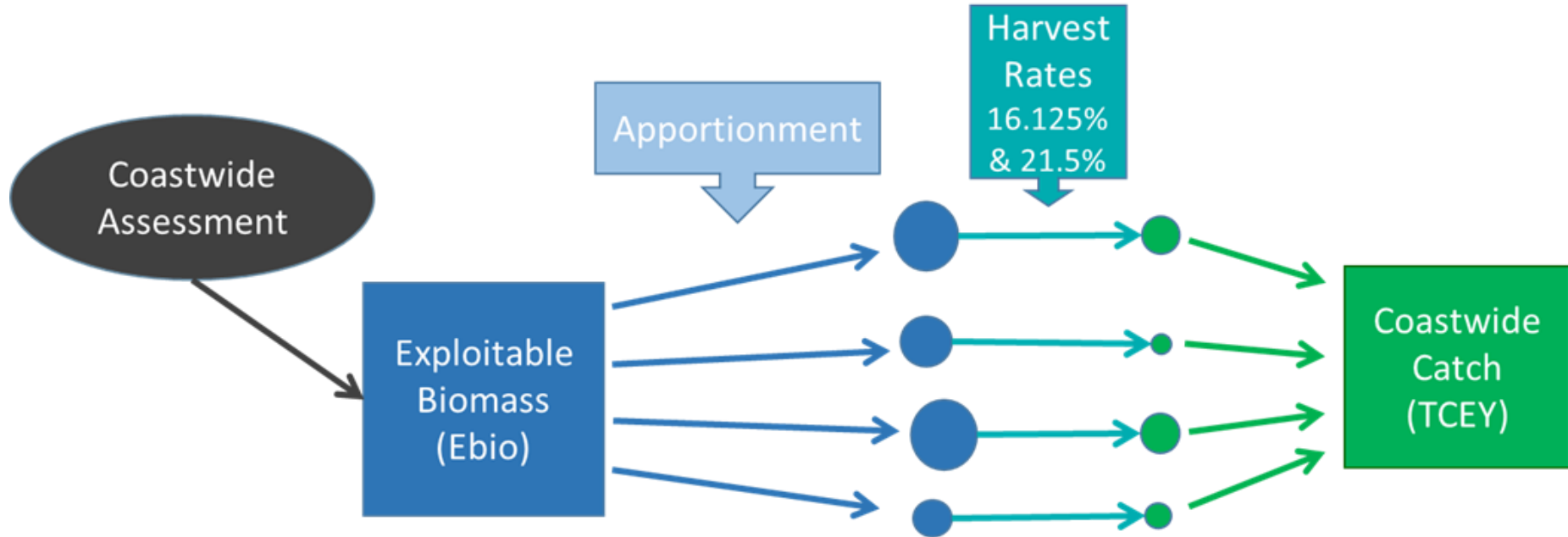
Current harvest policy

- **Scale:**
 - Exploitable Biomass (EBio) & harvest rates
- **Distribution:**
 - Apportionment and relative harvest rates

Scale and Distribution are not independent



Current harvest policy



Scale of exploitation (current harvest policy)

Ebio

- Uses externally derived selectivity
 - Not representative of the current stock assessment

Harvest rates (area-specific)

- 16.125%: Western areas (3B, 4A, 4B, 4CDE)
- 21.5%: Eastern areas (3A, 2C, 2B, 2A)
- Reduced by a control rule at low stock sizes ($< 30\%$ of B0)



Distribution of exploitation (current harvest policy)

Apportionment

- Distribute EBio to Regulatory Areas
- O32 WPUE from setline survey

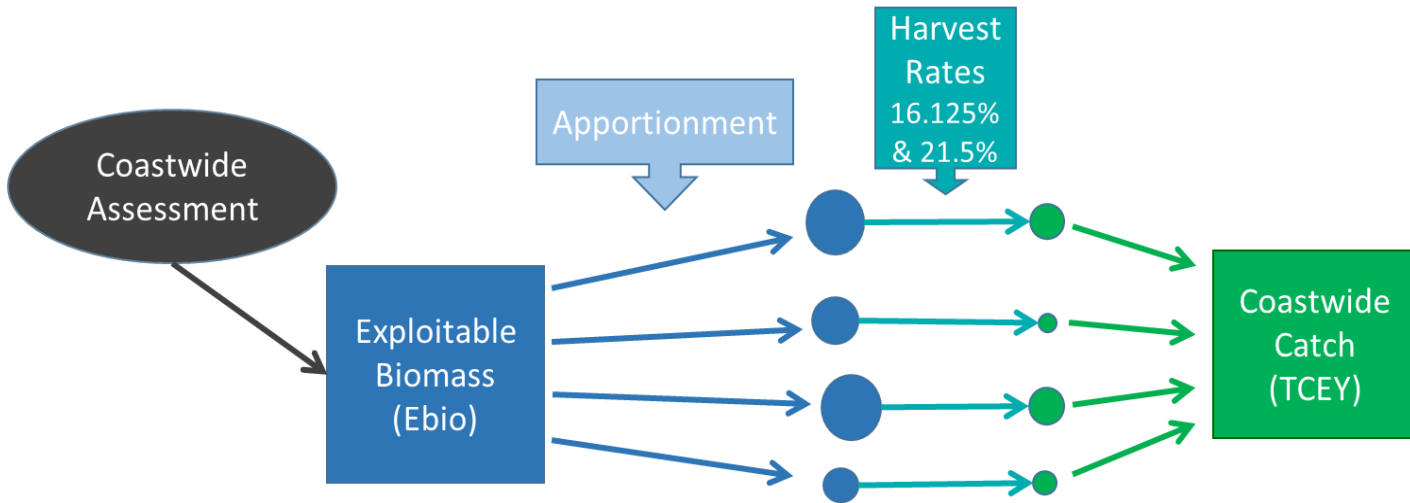
Relative harvest rates

- Higher harvest rates in East



Problems with the current harvest policy

- Scale (fishing intensity) and distribution (catch across areas) confounded
 - Coastwide assessment, split EBio into Areas, then sum it



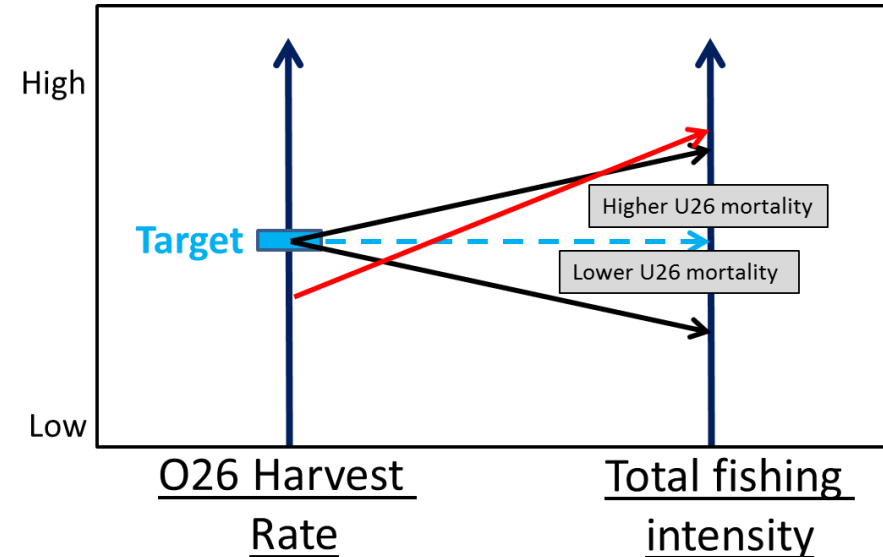
Problems with the current harvest policy

- EBio is inconsistent with assessment results
 - Selectivity out of sync with current assessment
 - Does not include all sources of removals
 - Does not exactly represent what the directed fishery mortality



Problems with the current harvest policy

- Mortality of U26 fish not explicitly accounted for
 - Apportionment (O32), Harvest rates (O26), EBio (???)
 - TCEY/FCEY remains unchanged regardless of U26 mortality
 - U26 mortality will be indirectly realized in later years

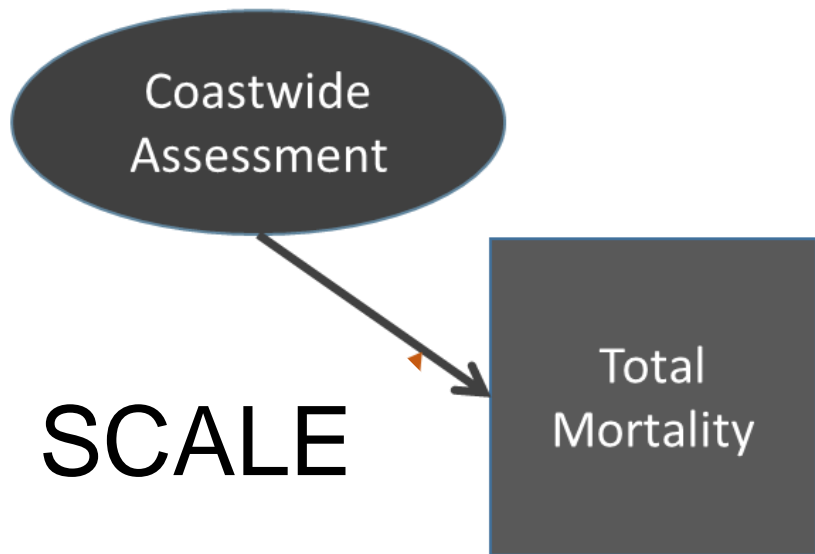


Managing on total mortality

- Earlier assessments included only age 8 and older halibut
- Those were updated to include age 6 and older
- Then, management was based on O32 mortality
- In 2011, updated management for O26 mortality
- Now, why not manage on **OZero (over zero)** mortality
 - Account for all removals across all fleets
 - Need a measure that accounts for all sizes and sources
 - Selectivity varies by fleet, thus harvest rates are not comparable



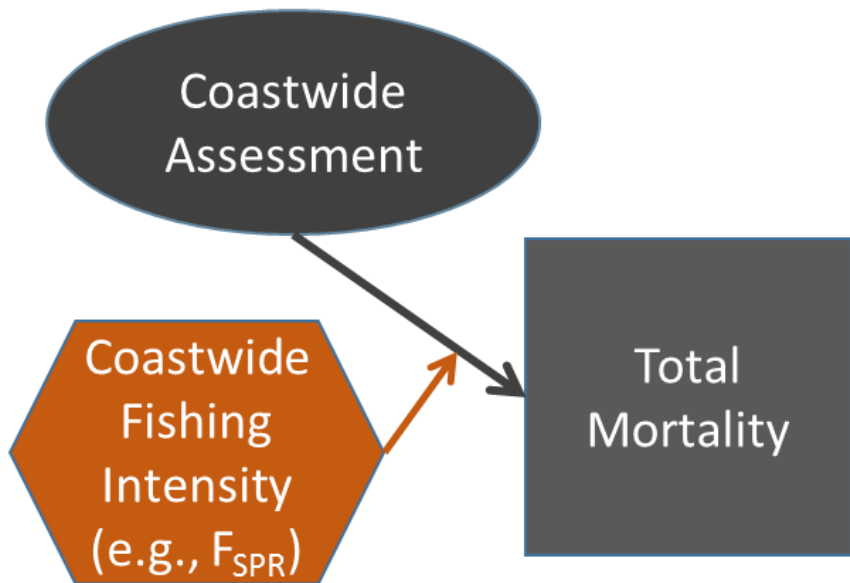
Rearranging the current harvest policy



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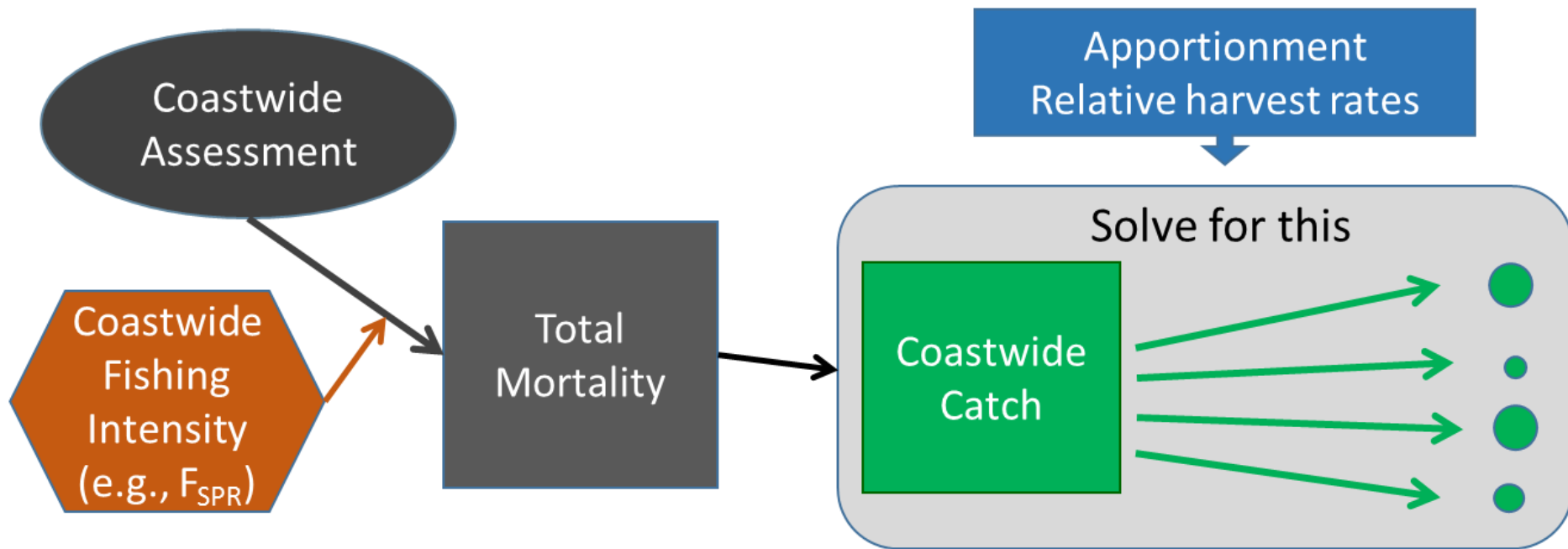
Rearranging the current harvest policy



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Rearranging the current harvest policy



Spawning Potential Ratio (SPR)

Spawning Biomass Per Recruit with fishing
Spawning Biomass Per Recruit with no fishing

divided by

- An equilibrium concept (long-term average)
- Find a fishing intensity that results in a specific SPR
 - $F_{SPR=XX\%}$
- Can be easily calculated in the stock assessment
- Provides a measure of fishing intensity on all sizes over all fisheries



Mapping to an SPR-based approach

1. Introduction of F_{SPR} to set the scale

- Use past adopted catch levels to define *status quo*

	Total removals (M lb)	Fishery CEY (M lb)	Fishing intensity	Stock Trend				Stock Status				
				Spawning biomass				Spawning biomass				
				in 2018		in 2020		in 2018		in 2020		
				is less than 2017	is 5% less than 2017	is less than 2017	is 5% less than 2017	is less than 30%	is less than 20%	is less than 30%	is less than 20%	
2017 Alternative												
No removals	0.0	0.0	F_{100%}	<1	<1	<1	<1	3	<1	1	<1	
Blue Line	37.9	26.1	F_{48%} 33%-62%	56	3	77	53	6	<1	12	<1	
status quo SPR	41.6	29.7	F_{46%} 32%-60%	68	6	87	64	6	<1	15	<1	



Benefits of an SPR-based approach

- Accounts for all mortality from all sources
- Separates scale and distribution
- Allows for evaluation of scale in an MSE



Looking into the future

- The *status quo* SPR
 - A stepping stone to map to a new harvest policy
 - Consistent with what we've been doing
 - The stock has recently been stable or slowly increasing at this F_{SPR} fishing intensity
- Various values of F_{SPR} can be evaluated with MSE
 - Evaluate various levels of fishing intensity against goals and objectives

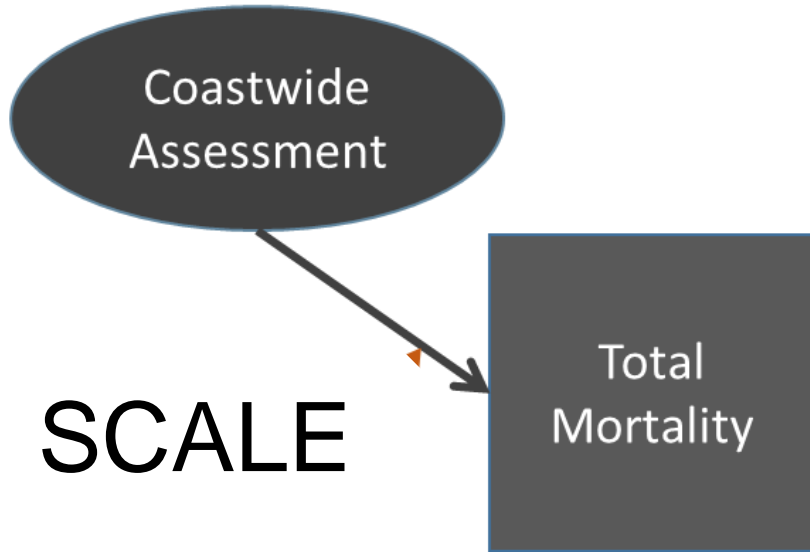


Recommendations

1. **CONSIDER** this proposed harvest policy (IPHC-2016-IM092-08 Rev_1) which uses an SPR-based approach and is presented as “*status quo* SPR”
2. **NOTE** that the IPHC Secretariat will use MSE to evaluate a modified harvest policy that separates scale and distribution, and accounts for all mortality.



Questions?



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