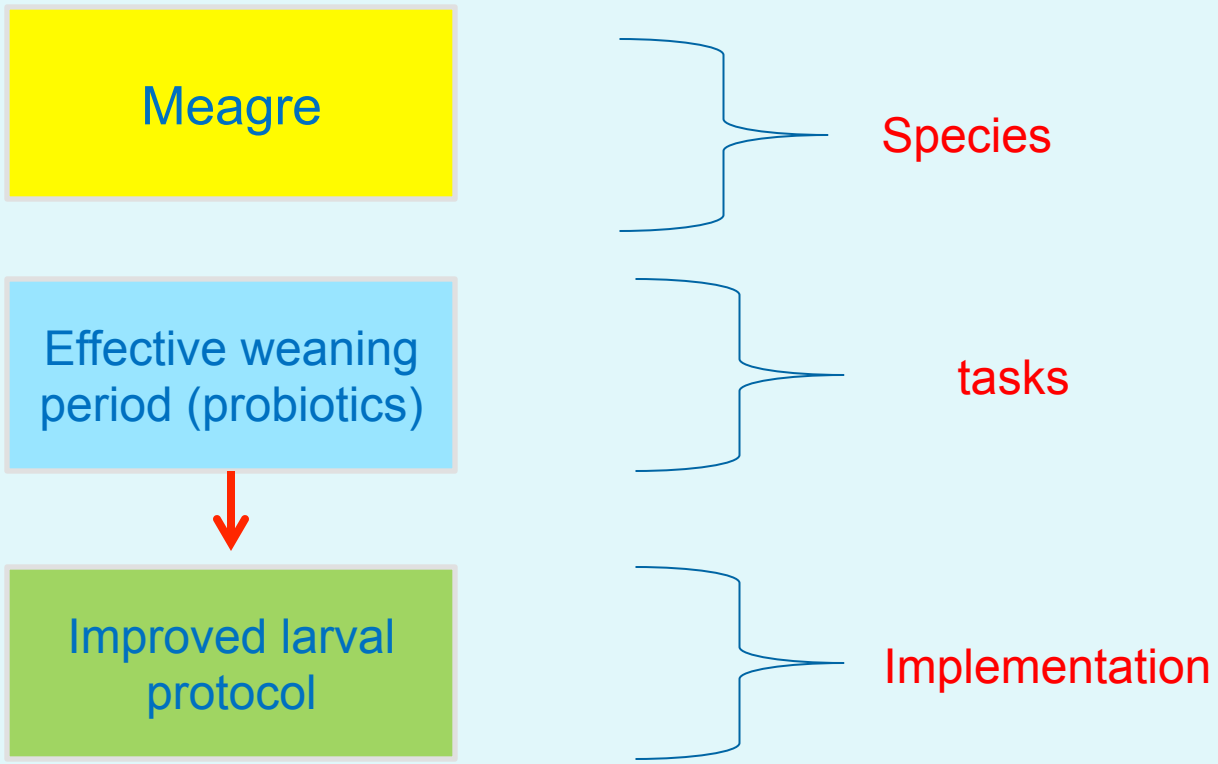
Larval Husbandry (WP14-19)

RTDs: IOLR, IRTA,ULL, HCMR, FCPCT, IEO, DTU, IMR, NIFES,

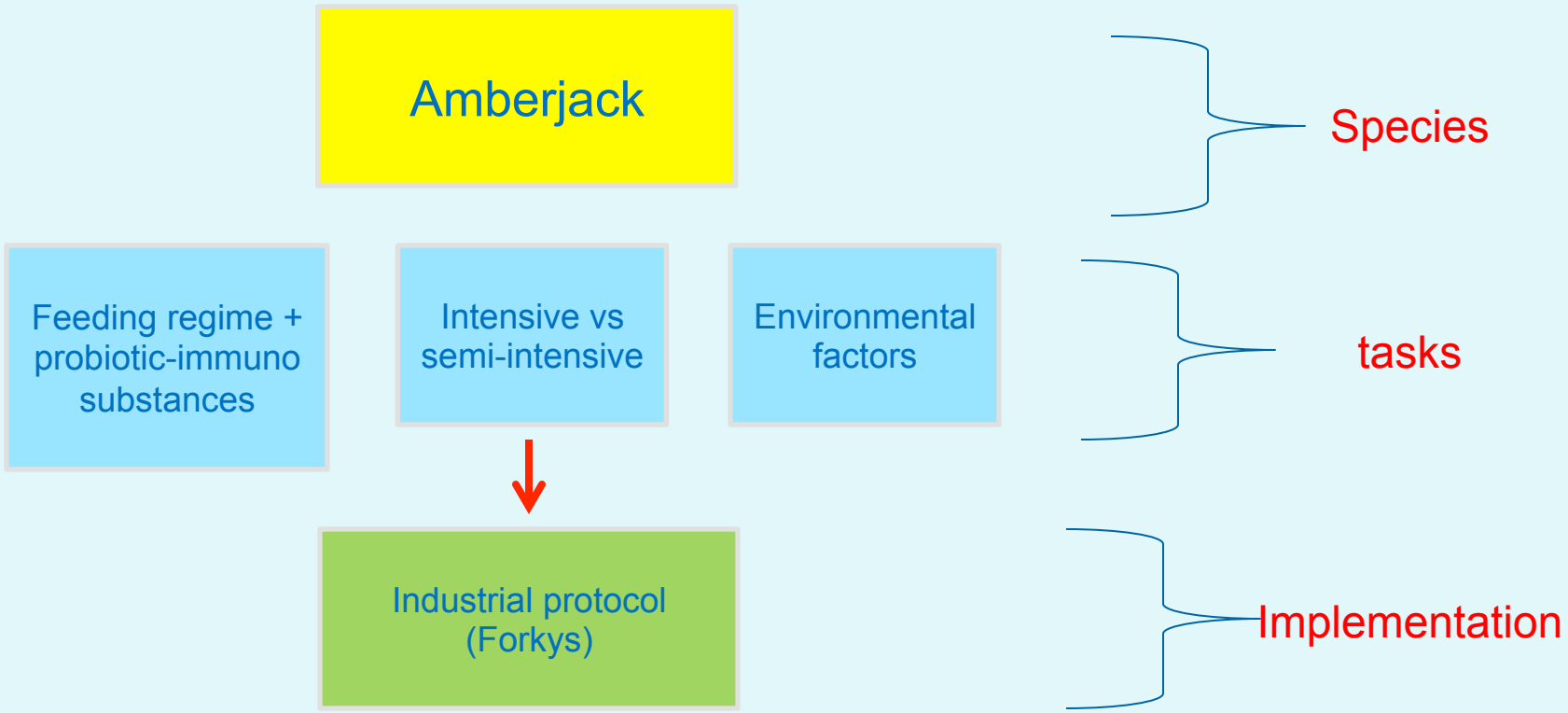
SMEs: FORKYS, ASIALOR, SWH,CMRM, MC2, DOR

Meagre strategy



WP14 Meagre			
Tasks	**Evaluation**	**Sub-tasks**	**Deliverable**
14.1 (IRTA)- effective weaning period (with or without probiotics)	•Growth, survival, size dispersion, j. quality, composition, pancreatic and intestinal enzymes (ULL)		D14.1 Improved larval protocol

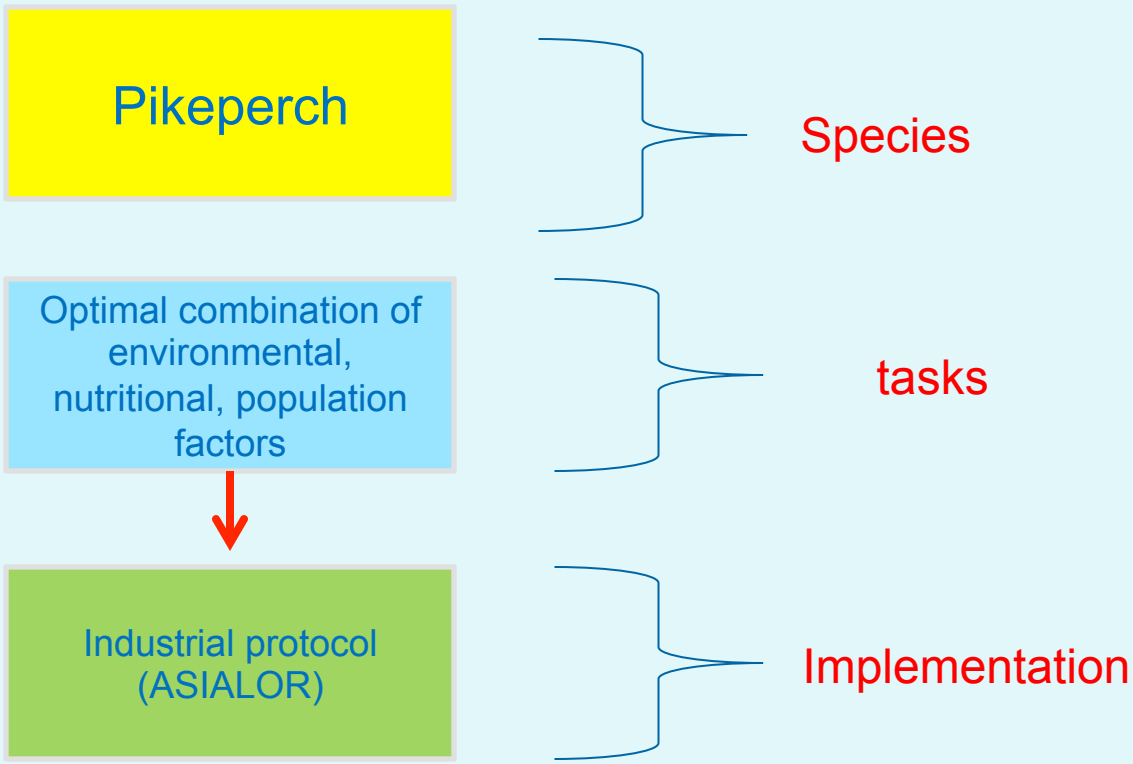
Greater amberjack strategy



WP15 Greater Amberjack

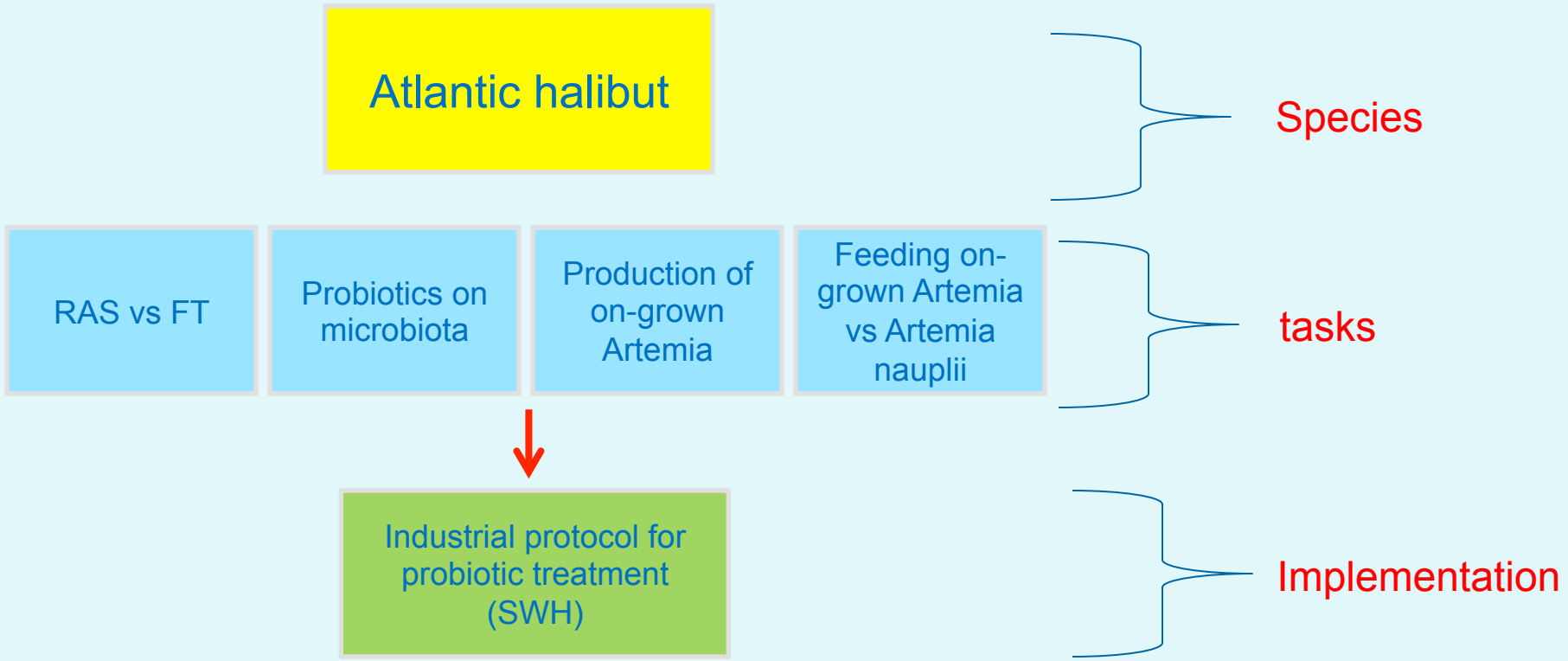
Tasks	Evaluation	Sub-tasks	Deliverable
15.1(IEO) Effect of feeding regime (conc. and freq.) and probiotics	•Survival, growth, development, deform., nutr. Cond (IEO) •oxid. Stress, antiox. Defense enzymes , immune syst.(IEO). •Ontogeny of DT enzymes(ULL)		D15.2 feeding protocol and use of immune modulators
15.2 (HCMR) intensive vs semi-intensive systems	•Ontogeny of visual system, oxid. Stress, somatotropic axis, antiox. Defense enzymes , immune syst. (HCMR)	15.2.1 (HCMR) RAS vs Mesocosm 15.2.2 (FCPCT) Stocking density 15.2.3 (ULL) Ontogeny of D.T.	D15.1 Effective stocking densities D15.4 Ontogeny of visual and digestive system
15.3 (FCPCT) Environmental parameters	•Growth, survival, histology, b. comp, deform, stress+skeletal gene exp.,J. quality, size distribution, somatotropic axis (FCPCT)	15.3.1 (FCPCT) Tank hydrodynamics 15.3.2 (HCMR) Light intensity and duration	D15.3 Optimum hydrodynamics and light conditions.
15.4 (IEO) Development of Industrial protocol	•Survival, growth, development, deform., nutr. Cond. •oxid. Stress , antiox. Defense enzymes, immune syst. Interval sampling for ossification patterns and skeletal deformities.	15.4.1 (IEO) Development of industrial protocol from results 15.4.2 (FCPCT) Ossification patterns and skeletal deform. at different levels of intensification 15.4.3 (FORKYS) validation at SME	D15.5 Industrial protocol

Pikeperch strategy



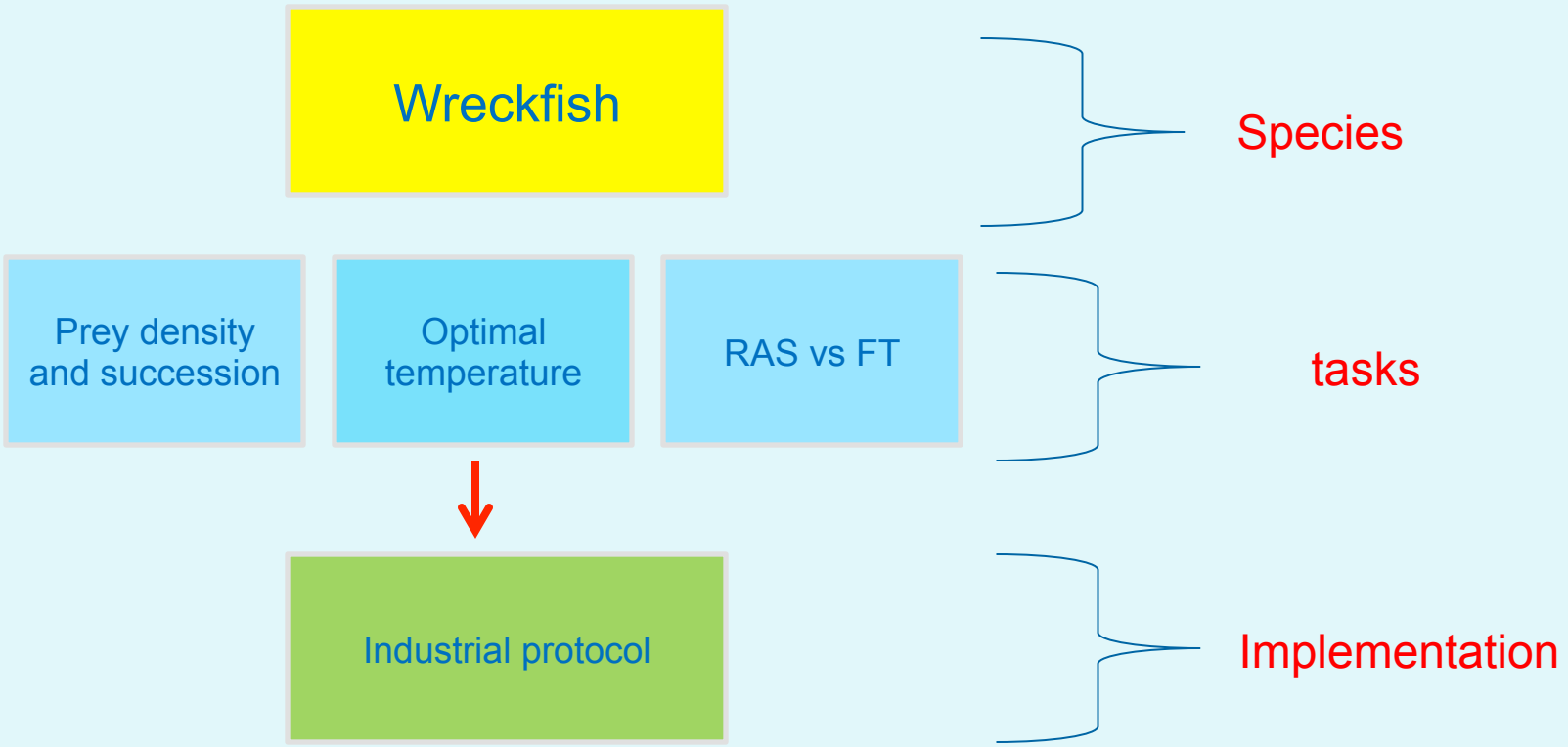
WP16 pikeperch			
Tasks	Evaluation	Sub-tasks	Deliverable
16.1 Optimal combination of factors for improved larval rearing 16.2 Development of industrial protocol	(UL, DTU) Effects of multifactorial designed experiments to test various factors (environ+nutritional+population), singly, in combination and interaction in terms of • cannibalistic behavior, larval morphogenesis (DTU), • ontogeny of skeleton, skeletal deform (IRTA)., • gene expression of transcription factors, signaling molecules, ECM of skeletal system, digestive hormones (?) Tested by SME ASIALOR		D16.1 Effect of environmental factors on larval rearing D16.2 Effect of nutritional factors on larval rearing D16.3 Effect of population factors on larval rearing 16.4 Identification of optimal combinations of factors 16.4 Evaluation of selected combinations under farm conditions. 16.5 Industrial protocol for pikeperch larval rearing

Atlantic halibut strategy



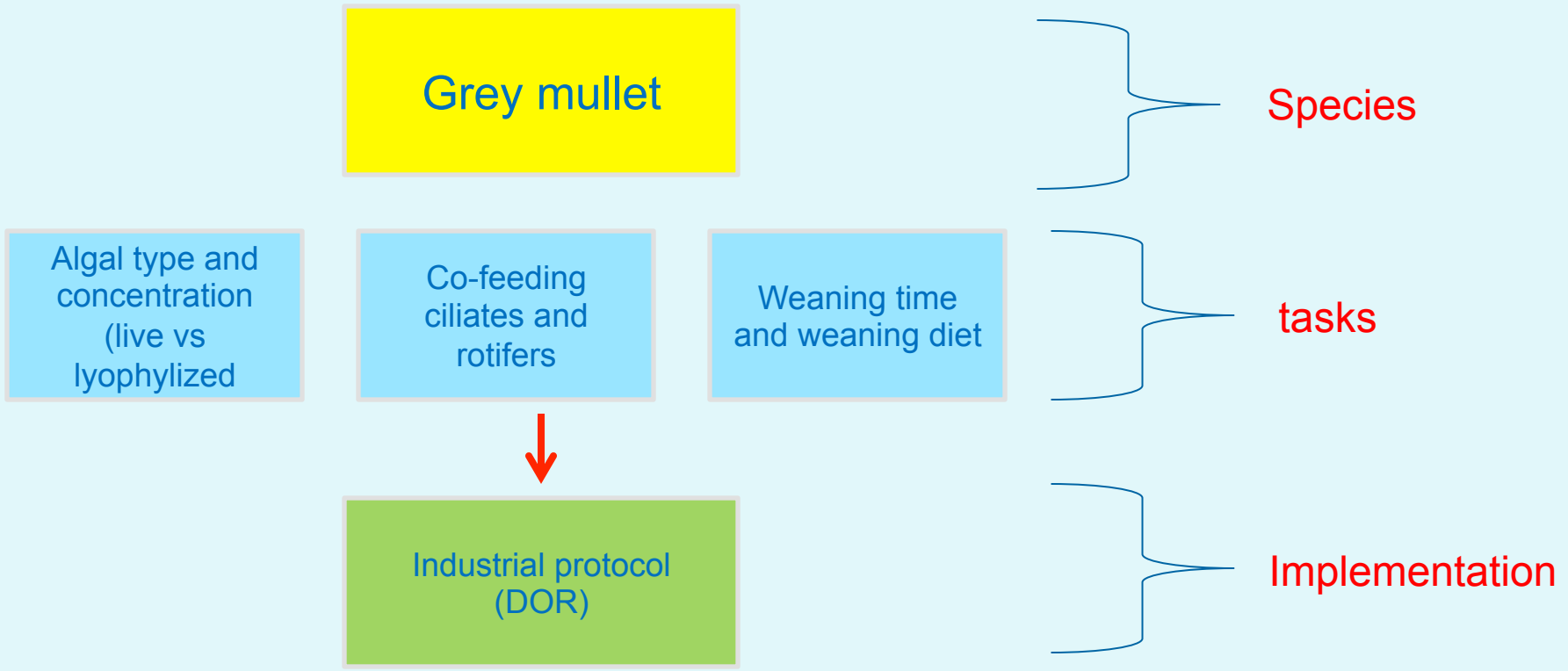
WP17 Atlantic halibut			
Tasks	Evaluation	Sub-tasks	Deliverable
17.1 Recirculation vs Flow through (IMR) 17.2 (IMR) Effects of probiotics on larval microbiota, survival and development of industrial protocol 17.3 (IMR, SWH) Production of on-grown Artemia 17.4 (NIFES, ULL) On grown Artemia vs Artemia nauplii until end of metamorphosis	•Growth, survival, pigmentation, eye migration (IMR, SWH), •Gut morphology (NIFES) •Digestive physiology (ULL-WP11) •Bacterial flora (IMR). •Nutrient analysis (NIFES) •Feeding, washing, disinfection of Artemia (IMR, SWH)	Based on results from 17.1, 17.2, full scale trial performed and industrial protocol for probiotic use.	D17.1 Production protocol of on-grown *Artemia*. D17.2 Determne if RAS more effective than FT D17.3 Effect of probiotics on larval microbiota and survival D17.4 Comparison of feeding on-grown *Artemia* vs *Artemia* nauplii on larval performance D17.5 Industrial protocol for probiotic treatment of larvae.

Wreckfish strategy



WP18 Wreckfish			
Tasks	Evaluation	Sub-tasks	Deliverable
18.1 Development of feeding methodology (HCMR)- prey densities and succession of prey type	•Ontogeny of larval DT and visual system. •Ontogeny of DT enzymes •Growth, larval quality, (HCMR, IEO)		D18.1 Development of the DT of larval wreckfish D18.2 Determine optimal temperature conditions for rearing larval wreckfish
18.2 Defining optimum conditions for larval rearing (IEO, MC2)	•Growth survival, larval quality, size(IEO, MC2)	18.2.1 Testing the effect of two temperature ranges (14-17 and 19-22 °C	D18.3 Develop a feeding protocol for wreckfish larvae
	•Larval biochemical profile (protein, lipids, EFA), biometric analysis, survival. (IEO, CMRM)	18.2.2 Test RAS (CMRM) vs FT (IEO)	D18.4 Determine the most effective culture system (RAS vs FT)

Grey mullet strategy



WP 19 Grey mullet

Tasks	Evaluation	Sub-tasks	Deliverable
19.1 Effect of algal type and concentration on larval performance (IOLR)	•Ingest. rate, growth survival, body comp., metamorphic synchrony, ontogeny of DT (IOLR,?)	19.1.1 Determine algal type (Nan. Vs Iso) and concentr. in larval rearing	D19.1 Determine the most effective algal type and concentration
19.2 Comparing selected algal protocol with lyophilized algae (IRTA)	•Growth, survival, ingest. Rate, body comp., matur. of DT, skeletal deformities (IRTA)	19.1.2 benefit of algal addition due to back-lighting or other factors	19.2 Evaluate effectiveness of replacing live algae with lyophilized algae
19.3 Determine the effect of co-feeding ciliates and rotifers on DT maturation and enzyme production (IOLR, Zoopt)	•Gene expression of alk. Phosphatase and PepT1, growth, survival, FAA, BAA, FA (IOLR)	19.1.3 weaning diets varying in protein, cho, lipid at suggested weaning time and weaning diet change	19.3 Effect of co-feeding rotifers and ciliates
19.4 Determine weaning time and weaning diet based on shift from carnivorous to herbivorous feeding	•Gene expression of Alk. Ph., PepT1,growth, survival, FA (IOLR) •Alk. Prot., amylase, lipase, trypsin, pepsin, alk. Ph., cytosol enz. (leu-ala pept.) (IRTA)		19.4 Determine weaning time and weaning feed according to shift from carnivorous to omnivorous feeding. 19.5 Evaluate an improved grey mullet larval rearing protocol in commercial hatchery
19.5 Testing improved larval rearing protocol in commercial hatchery (DOR)	•Growth, survival		

Common Themes in Larval Husbandry GWP

- Intensive vs extensive system (mesocosm)
- Tank greening and algal selection
- Improving live food performance
- Prey densities and feeding frequencies
- Effect of probiotic-immunstimulant substances
- RAS vs FT
- Environmental conditions on larval rearing
- Advancing weaning period