The Ecosystem Services Review for Impact Assessment

May 16, 2013
IAIA, Calgary

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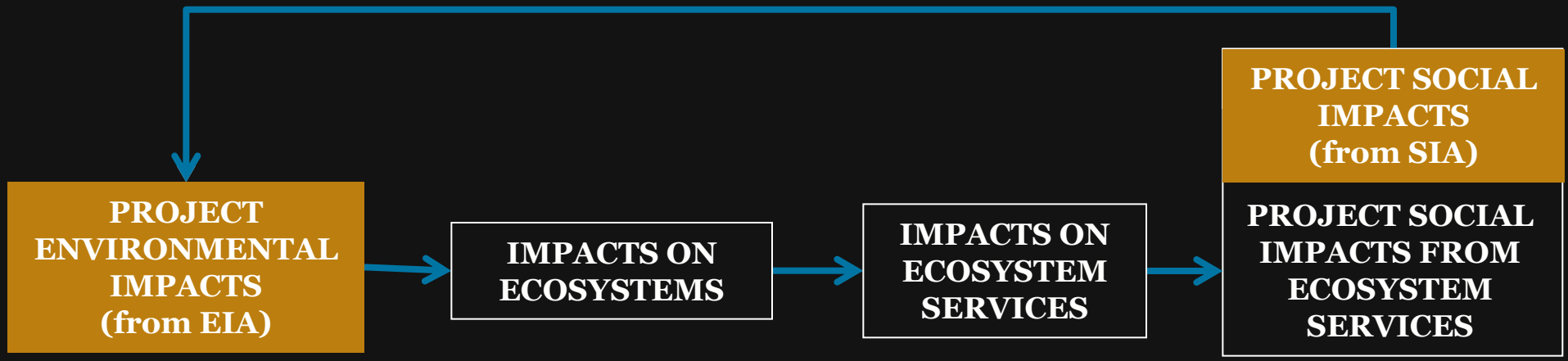
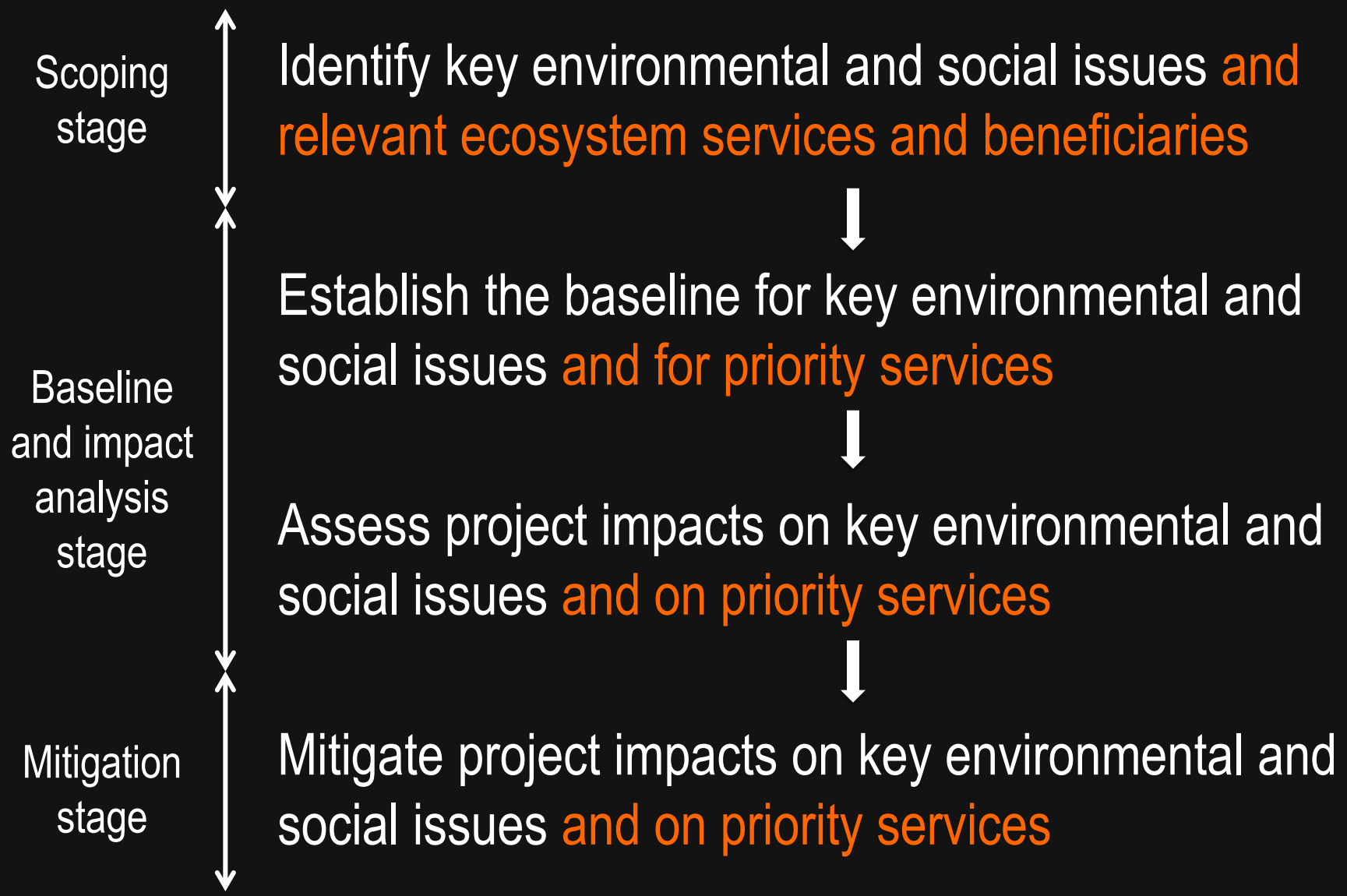
Ecosystem services: how it complements ESIA



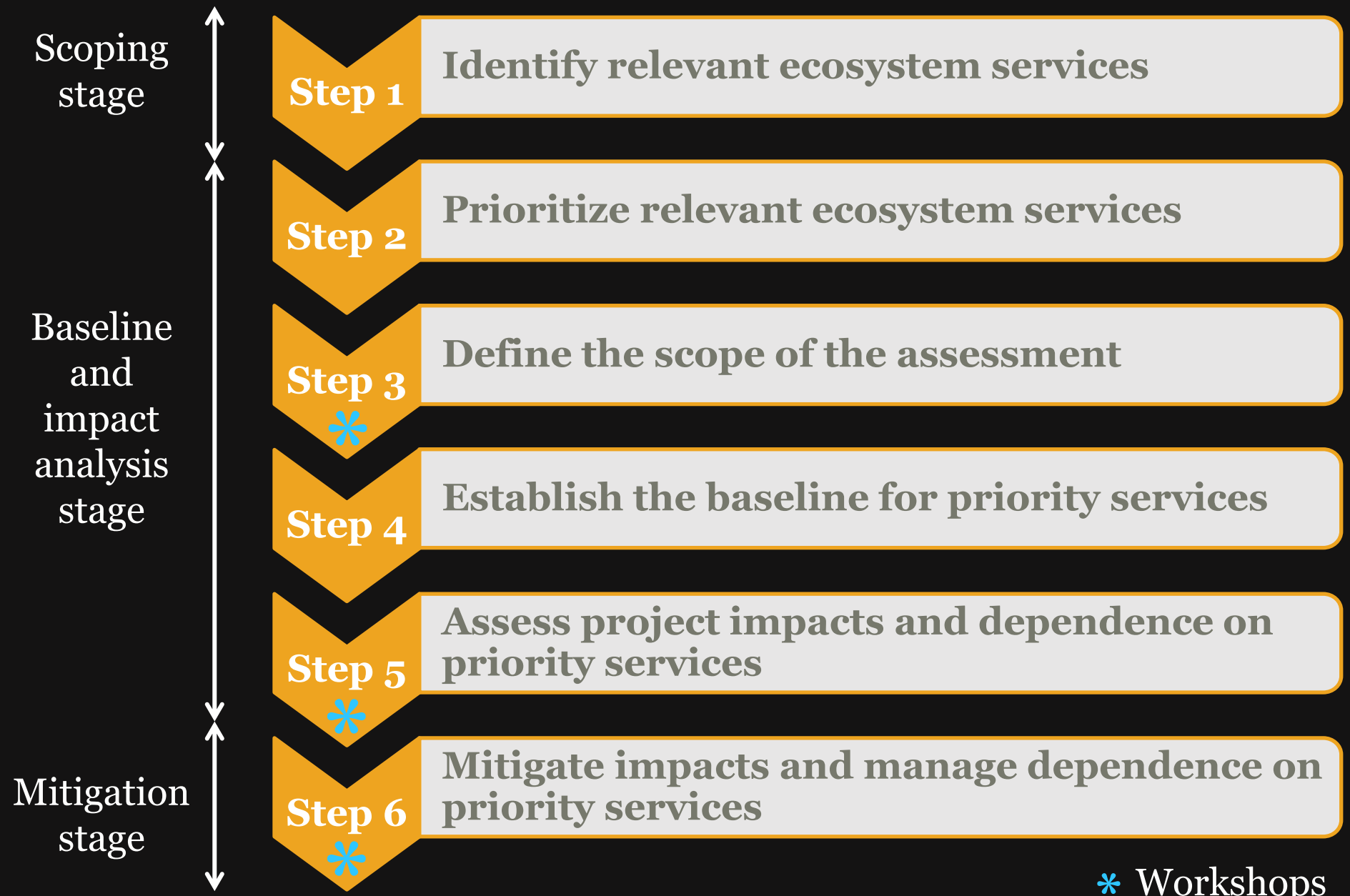
Conducted during standard ESIA

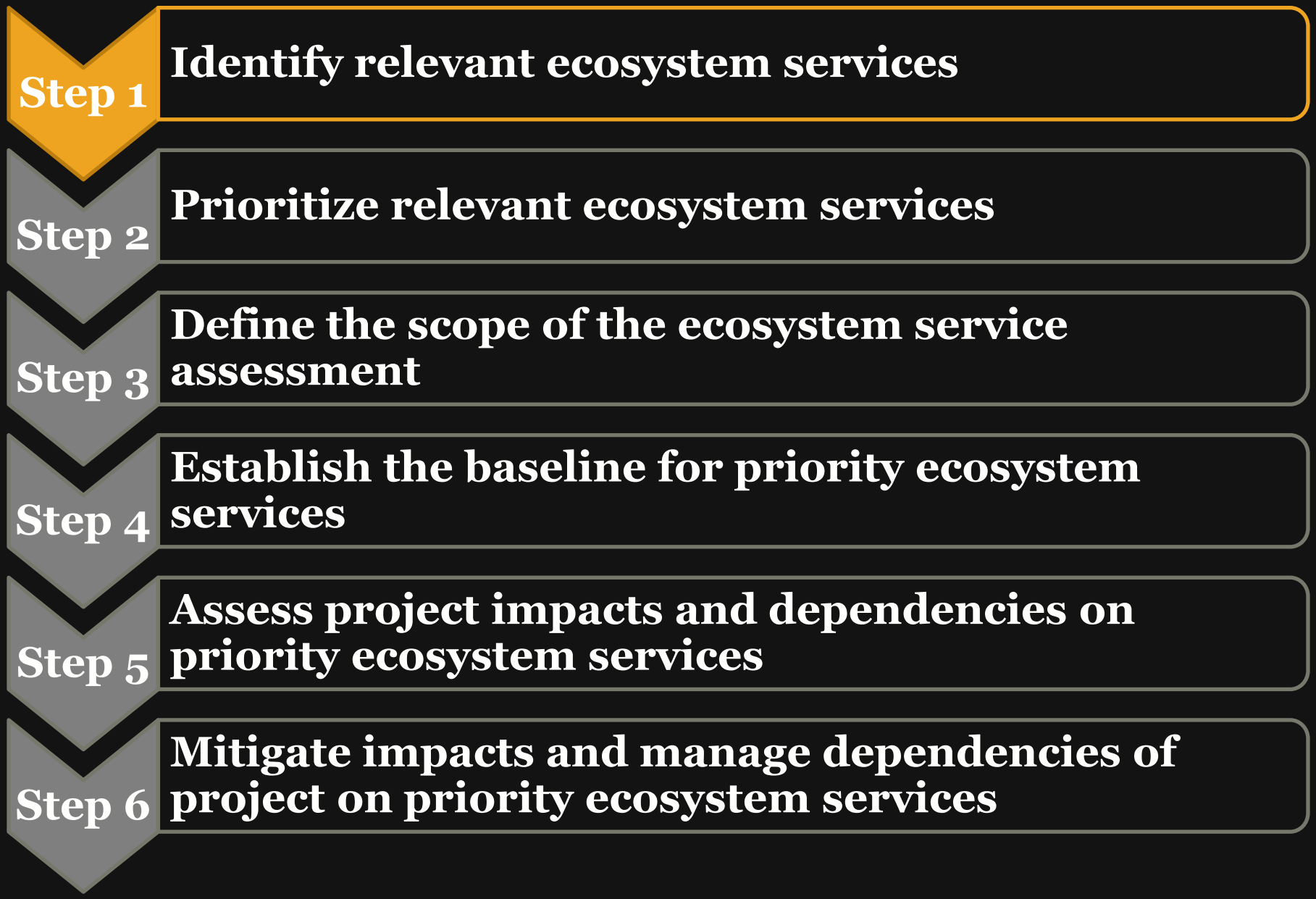
Conducted during the ecosystem service impact assessment

ESR for IA: how it fits in the ESIA process



ESR for IA: how it is implemented

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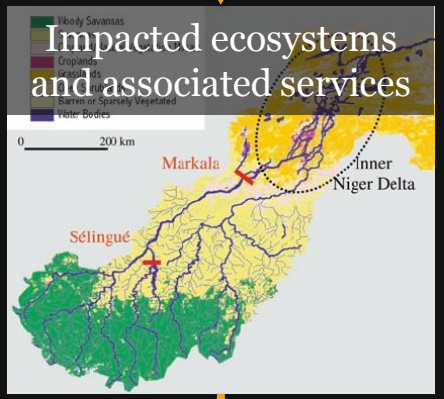
Step 1: Identify relevant ecosystem services



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Could the project affect the ability of others to benefit from this ecosystem service?

Yes or ?

Is this ecosystem service important to beneficiaries' livelihood, health, safety or culture?

Yes or ?

Do beneficiaries have alternatives to this ecosystem service?

No or ?

Priority ecosystem services

ESR for IA: Impact Prioritization Spreadsheet

From Step 1			Step 2.1: Could the project affect the ability of others to benefit from this ecosystem service?		Step 2.2: Is this ecosystem service important to beneficiaries' livelihoods, health, safety or cultural heritage?		Step 2.3: Do beneficiaries have alternatives to this ecosystem service?		Priority ecosystem services
Relevant ecosystem services	**Affected beneficiaries** *Note: If one ecosystem service benefits more than one group of beneficiaries, add a line.*	**Affected benefits** *Note : If one group of beneficiaries derive more than one benefit from a single ecosystem service, add a line.*	*Y Yes* *N No (go to next line)* *? Unknown*	**Comments or supporting information**	*Y Yes* *N No (go to next line)* *? Unknown*	**Comments or supporting information**	*Y Yes* *N No* *? Unknown*	**Comments or supporting information**	*1 Priority ecosystem services* *0 Non-priority ecosystem services*
Impacted ecosystem: *Tundra*									
Wild foods from reindeer	Commercial hunters from towns W, X and Y and their households	Income	?	Change in reindeer population is likely to be beyond natural variation within hunting areas, which will be reflected by smaller hunting quotas. There is no discarded meat. Any decrease in number of animals will impact the benefits derived from reindeer meat.	Y	Comercial hunters get at least 60% of their income from hunting.	N	Comercial hunters cannot get more than 40% of their income from sources other than hunting.	1
		Food and protein intake	?		Y	Reindeer meat is the only source of meat comercial hunters provide to their families.	N	Comercial hunters are poor and cannot afford buying the same quality of food	1
		Quality of life	?		Y		N	Hunting reindeer is a pillar of community and personal identity. There is no alternative to it.	1
		Self-esteem	?		Y	Being a commercial hunter has a good social status despite low income.	N		1
		Ability to help others	?		Y	Sharing of traditional foods is a main component of indigenous culture and well being	N		1
	Free time hunters from the province and their households	Food and protein intake	?		N	reindeer meat is only one of the sources of meat free timehunters consume.			0
		Quality of life	?		Y		N	Hunting reindeer is a pillar of community and personal identity. There is no alternative to it.	1
		Self-esteem	?		Y	The vast majority of households in this Arctic region have an adult with a hunting licence.	N		1
		Ability to help others	?		Y	Sharing of traditional foods is a main component of local culture and well being	N		1
Fur from reindeer	Commercial hunters from towns W, X and Y and their households	Income	?	Change in reindeer population is likely to be beyond natural variation within hunting areas, which will be reflected by smaller hunting quotas. The fur of most animals is used. Any decrease in number of animals will impact the benefits derived from reindeer meat.	?	The use of fur is not known.	Y	Can be replaced by seal fur provided that increased seal hunting would still be sustainable	0
		Sense of identity (traditional clothes)	?		?		Y		0
	Free time hunters from the province and their households	Sense of identity (traditional clothes)	?		?		Y		0

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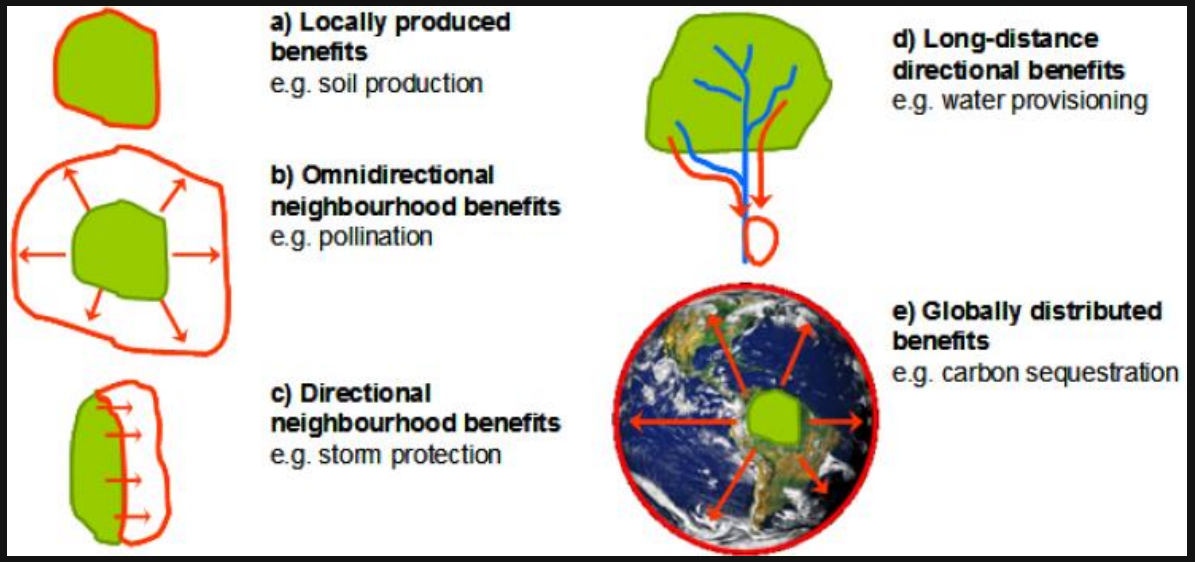
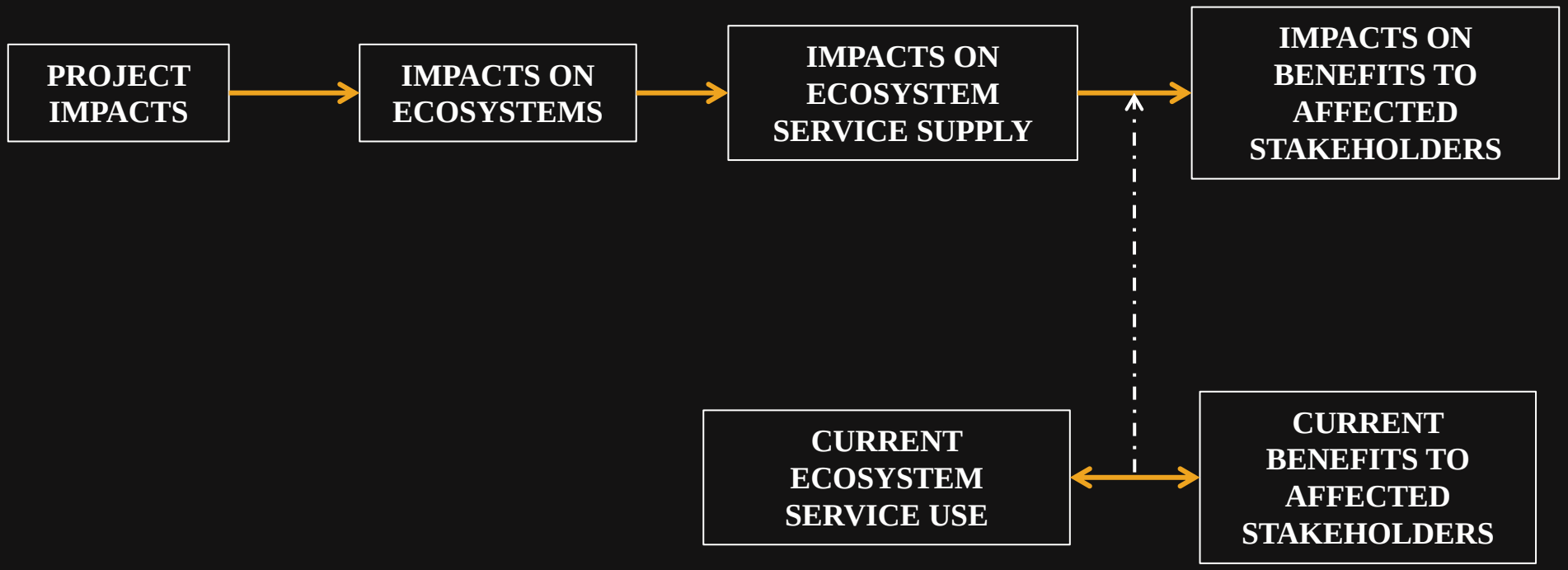
Sub-step 3.1: Delineate the geographic scope of the ecosystem service impact assessment

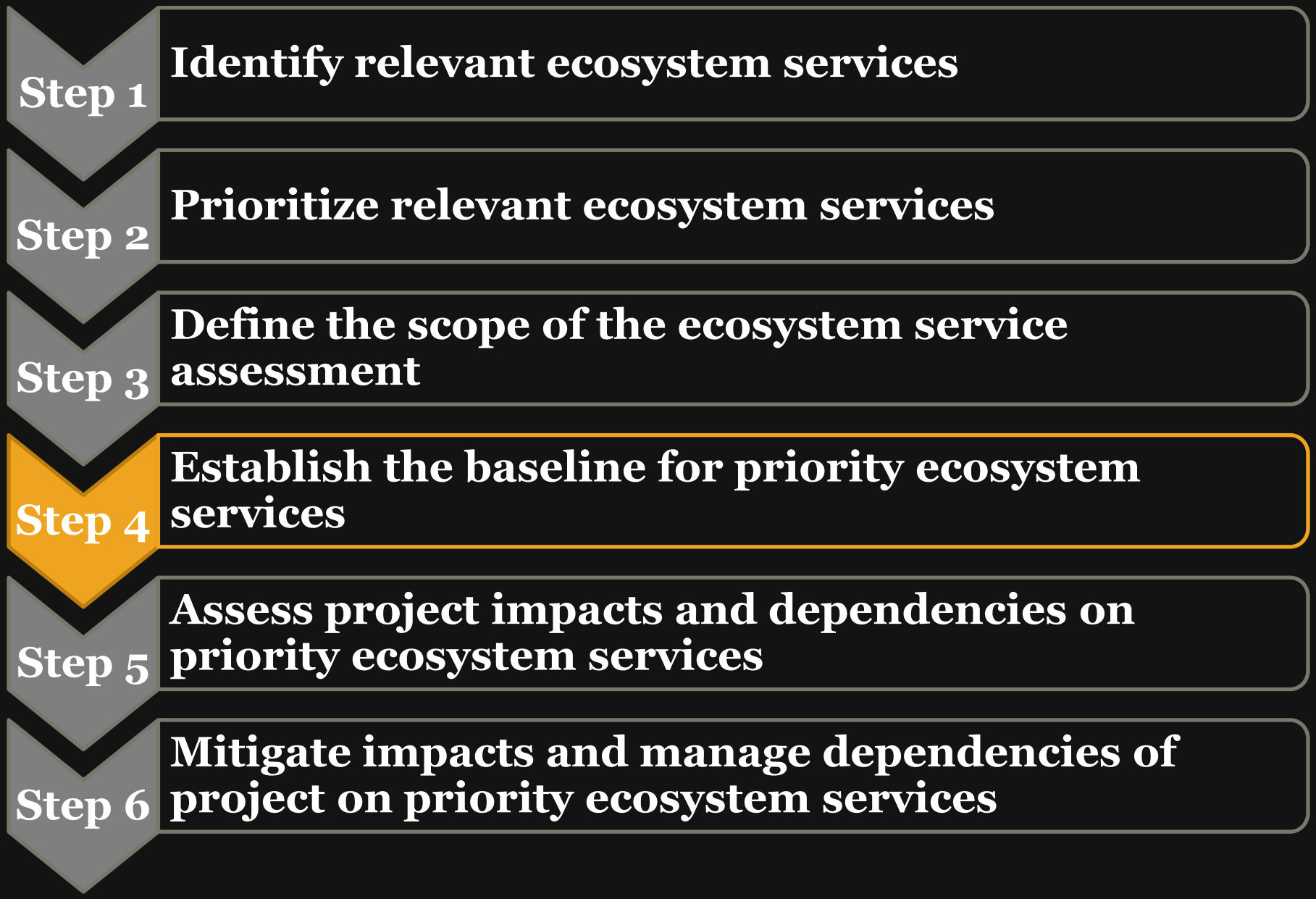


Impact assessment area includes:

- Ecosystems supplying priority services
- Locations where affected stakeholders access priority services

Sub-step 3.2: Identify indicators of project impact on priority ecosystem services

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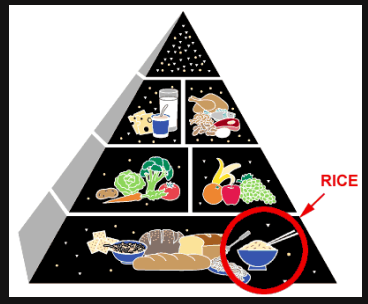
CURRENT ECOSYSTEM SERVICE USE

10 tons of rice/ year sold to markets

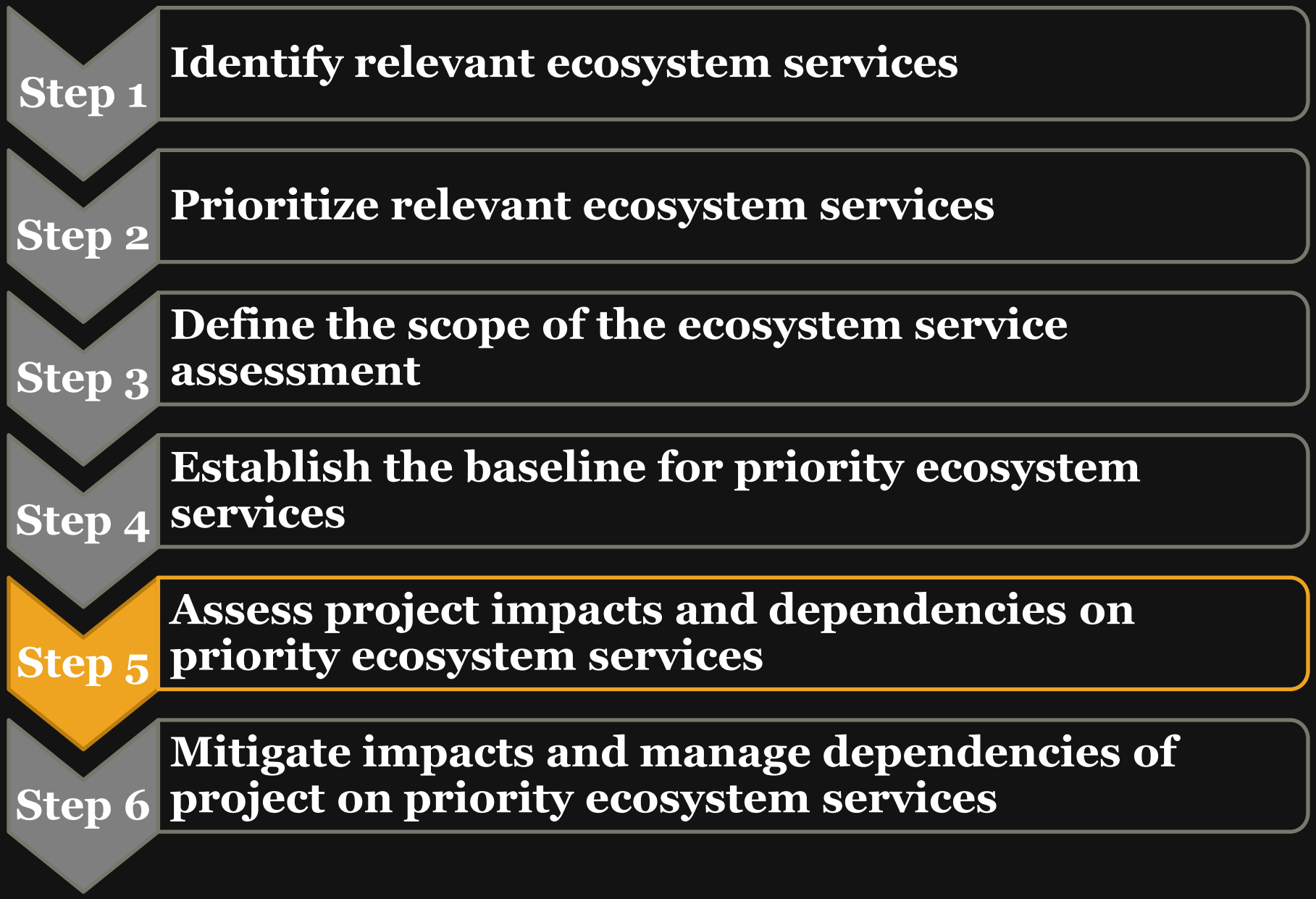
2 tons of rice consumed by farmers' family

CURRENT BENEFITS TO AFFECTED STAKEHOLDERS

$200,000 income from rice/ year



Level of nutrition among farmers' family: 85% good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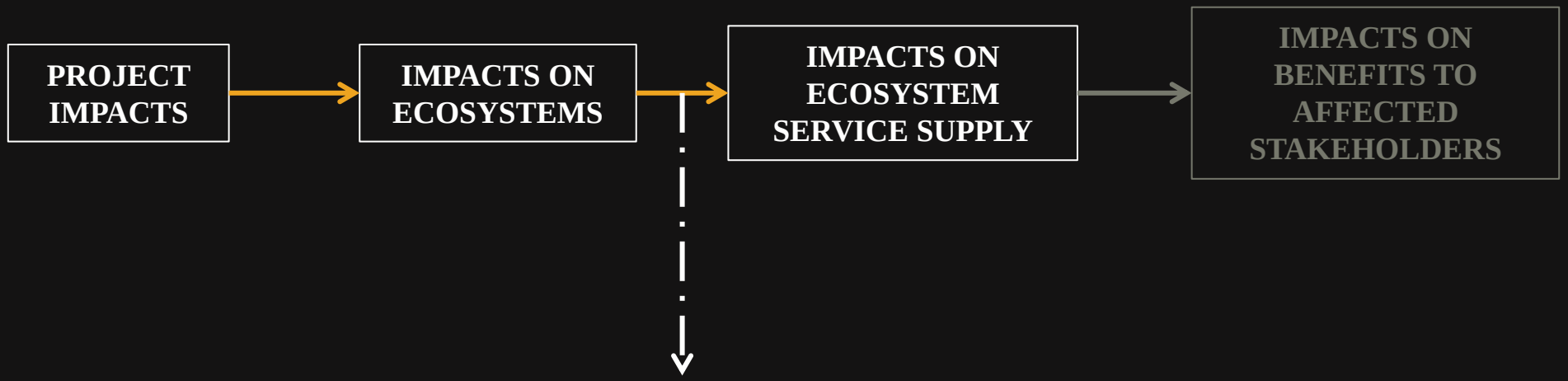
Sub-step 5.1: Predict project impacts on ecosystem service supply



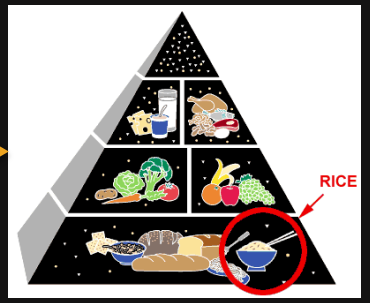
Methods

- Infer the predicted changes in ecosystem service supply from the extent of changes in the ecosystem, based on expert knowledge

- Model the predicted changes in supply quantitatively, based on ecological production functions

Sub-step 5.2: Predict project impacts on ecosystem service benefits to affected stakeholders

PROJECT IMPACTS → IMPACTS ON ECOSYSTEMS → IMPACTS ON ECOSYSTEM SERVICE SUPPLY → IMPACTS ON BENEFITS TO AFFECTED STAKEHOLDERS

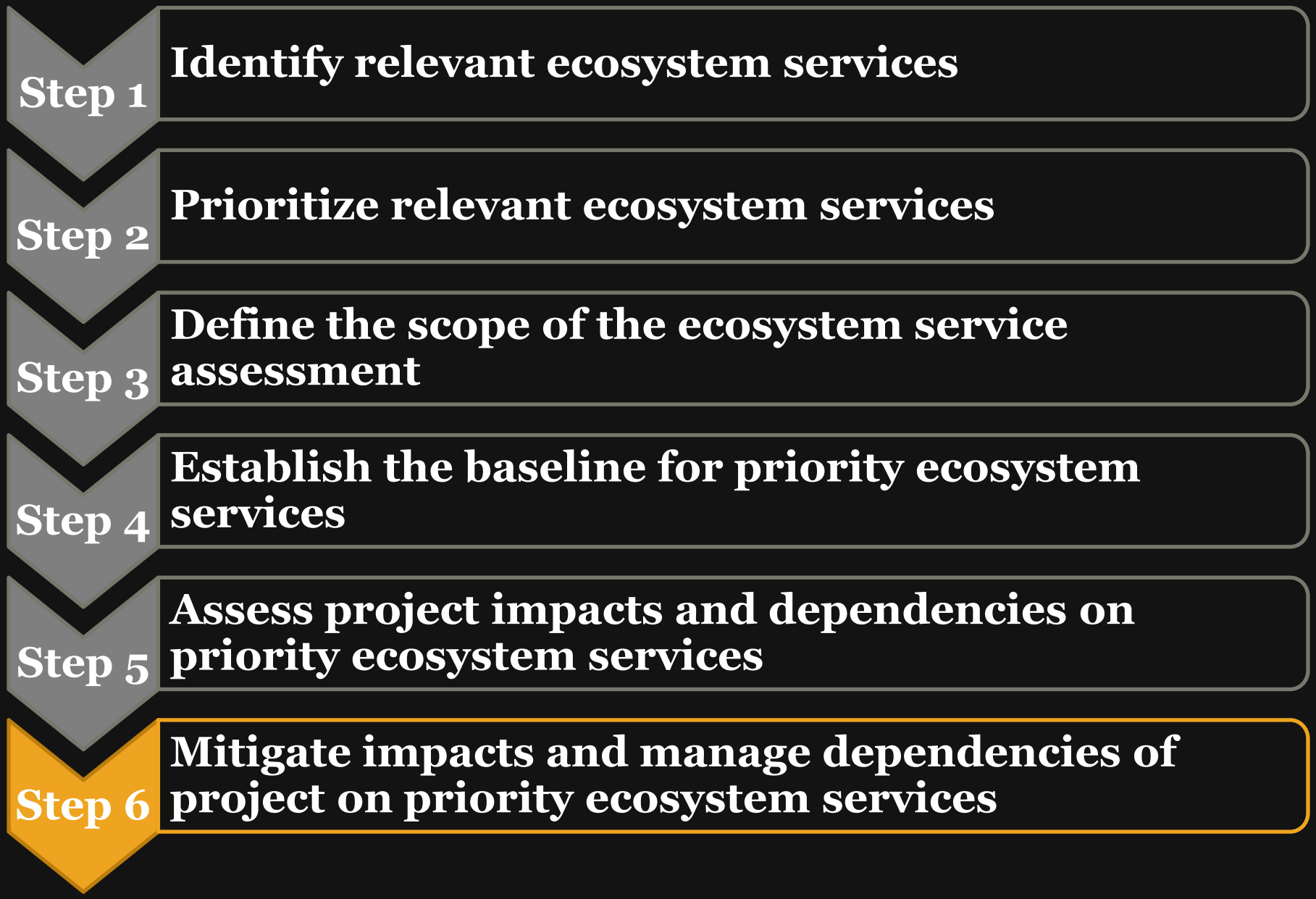


Sub-step 5.3: Assess significance of project impacts on affected stakeholders

Table 8: Assessment of significance of loss in ecosystem service benefit brought by the project

			Sensitivity of affected stakeholders to loss in ecosystem service benefit		
			Low Strong and diversified asset portfolio; high ability to adapt to loss in ecosystem service benefit and maintain overall well-being.	**Medium** Medium-size and moderately diversified asset portfolio; ability to at least in part adapt to loss in ecosystem service benefit and maintain overall well-being.	**High** Small and concentrated asset portfolio; limited ability to adapt to loss in ecosystem service benefit and maintain overall well-being.
Magnitude of loss in ecosystem service benefit	**Negligible**	Loss in ecosystem service benefit remains within the range commonly experienced by affected stakeholders. Loss in ecosystem service benefit categorized as "negligible" by affected stakeholders.	Negligible	Negligible	Negligible
	Low	Relatively small loss in ecosystem service benefit from baseline conditions. The loss in ecosystem service benefit is for a short duration or occurs with low frequency. Loss in ecosystem service benefit categorized as "low" by affected stakeholders.	Negligible	Minor	Moderate
	Medium	Relatively large loss in ecosystem service benefit from baseline conditions. The loss in ecosystem service benefit is of medium duration or occasional frequency. Loss in ecosystem service benefit categorized as "medium" by affected stakeholders.	Minor	Moderate	Major
	Large	Loss in ecosystem service benefit dominates over baseline conditions. The loss in ecosystem service benefit is of long duration, even irreversible, or frequent. Loss in ecosystem service benefit categorized as "high" by affected stakeholders.	Moderate	Major	Major

Source: Adapted from ERM 2013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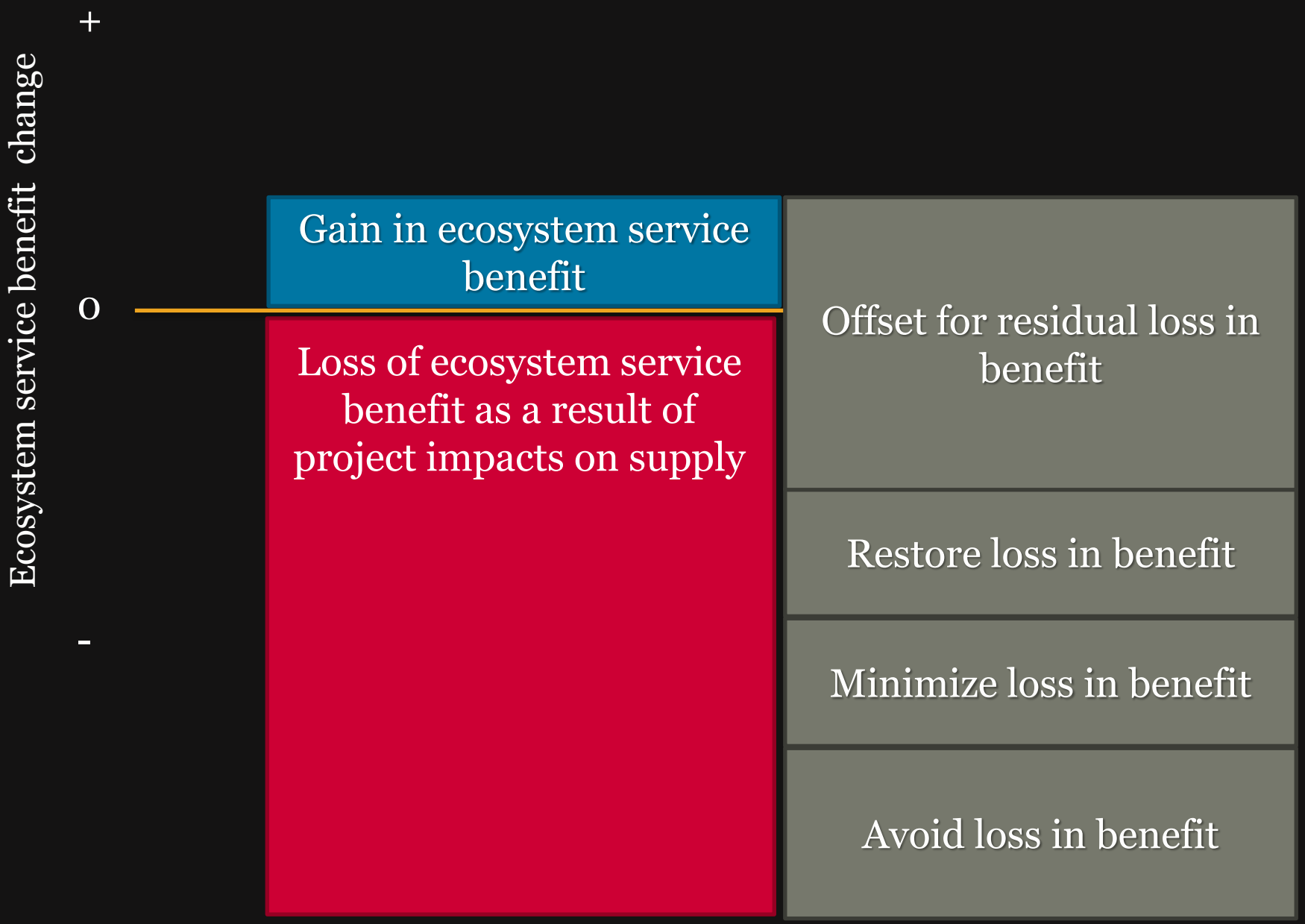
Ecosystem service benefit change
+
0
-
Gain in ecosystem service benefit
Loss of ecosystem service benefit as a result of project impacts on supply
Offset for residual loss in benefit
Restore loss in benefit
Minimize loss in benefit
Avoid loss in benefit