Name of the case study	Great Northern Peninsula – Seal industry - Newfoundland, Canada [Loss of Resilience]	
What about this case makes it interesting? How does this case contribute to understanding of resilience and/or regime shifts in the Arctic?	While this case is set in the sub-Arctic, the impacts of international drivers in the form of animal welfare pressure on the trade of seal products faced by seal hunters here are similar around the Arctic. This case focuses on how these external demands have impacted the industry in Newfoundland. The rules developed for the protection of seals and subsequent ban of trade in seal products were based in incorrect depictions of seal hunting. The result of these institutions has been economically and culturally costly for these communities. The study contributes to the understanding of how discourse, rooted rather in perception than knowledge, has weakened the resilience of communities in the sub-Arctic. While the commercial seal industry has maintained local traditional knowledge despite international pressures to abolish sealing practices, the outcomes have had severe socio-economic impacts by severely limiting their livelihood options. In addition, the author calls for further work in understanding these communities. Given that the so-called 'commercial' seal hunt has experienced significant international opposition, one would assume that knowledge on the seal hunters and their communities exists. This, however, would be a premature assumption as little ethnographic data on sealers, their communities, and particularly the processing sector can be found.	
Templated completed by:	Nikolas Sellheim, Faculty of Law, University of Lapland, Finland	**Key references: Cite in the text using (1), (2), (3) etc. and provide a reference list at the bottom of the template.** (1) Sellheim, N. 2015. Morality, practice and economy in a commercial sealing community. *Arctic Anthropology* 52(1):61-80. (2) Ryan, S. 1994. *The ice hunters: A history of Newfoundland sealing to 1914*. Breakwater Books Ltd., St. John's, Newfoundland, Canada. (5) Sellheim, N. 2013. The neglected tradition? The genesis of the EU seal products trade ban and commercial sealing. *The Yearbook of Polar Law* 5(1):417-450.
Reviewed by (name and affiliation)		

Category (mark with X)	**Resilience/ Adaptability**		**Loss of resilience**		**Transformation**	
			X			
Case study details:	**Country**	**Place**	**Scale – space**	**Scale – time**	**Sector(s)**	**Other (e.g. disturbance)**
	Canada	Newfoundland	Mainly Newfoundland, connections and drivers to/from EU and further	1790s 1914-date	Seal hunting	Preferences and rules impose on the industry

Drivers (mark with X in appropriate boxes)	**Climate**	**Geopolitical**	**Mineral/ oil extraction & infrastructure**	**Tourism**	**Shipping**	**Biological invasion**	**Rapid demographic change**	**Other: *state here***
		X international						

	Biophysical	**Social**
1. Basic description of coupled social-ecological system in focus (What are the key components and stake holders) If possible, draw a systems diagram or conceptual map of the case – this can be a series of diagrams to capture different periods in the case and the drivers/ actors/ events that characterize the period.	a) What types of ecosystem(s) and other major biophysical features are present? - Northeastern Newfoundland Ecoregion - Sub-Arctic - Sea ice (Labrador current) - Marine ecosystem; - Summer mean: 12.5°C - Winter mean: -3.5°C - Annual precipitation mean 900 – 1,000 mm b) How are the case boundaries defined in terms of ecosystems or biophysical characteristics?	c) Who are the key groups of people in this case? - Fishermen (who are also sealers) - Fishing communities - Processing plant workers - Seal protesters d) What kinds of livelihoods are important in the system? - Commercial fisheries - Seal hunting - Seal/fish processing e) What institutions are key to this case? If possible, define what scale it addresses. Department for Fisheries and Oceans • Legal framework • Monitoring • Enforcement European Union • Markets • Precedent setting Canadian Sealers Association • Sealers' representation • DFO enforcement (3) f) How are the case's boundaries socially defined, and how do these social boundaries relate to biophysical boundaries?

2. Timeline
Draw a timeline of *key* events/ developments to the case. Points to include:
 	
Make clear the period of time over which the change is being considered.
 	
Provide a brief description of event/ actors, and ecological impacts. Mark particularly significant events with *.
 	
Consider both biophysical and social dimensions.
 	
Additional points that can be considered:
 	
Is it possible to identify periods of change from one type of system to another, transformations?
	(2, 3, 4, 5, 6)
	
	- 1793/94:
	  o The first two vessels set out exclusively for the hunt for seals.
	- 1914:
	  o *Newfoundland* and *Southern Cross* disaster*
	  ▪ Two sealing vessels were trapped in a heavy storm in late March. 132 sealers of the *S.S. Newfoundland* were caught on the ice northeast of Newfoundland with a loss of life of 77. However, the vessel was able to return to port. The *S.S. Southern Cross* was never found and sank probably close to the Avalon Peninsula. With it the vessel took all 173 sealers. One major problem was the lack of wireless communication on the sealing vessels. After his disaster, all vessels had to be equipped with wireless communication. The sealers memorial in Elliston, where a large proportion of sealers of the *Newfoundland* stemmed from, was opened in 2014 to pay tribute to the lives lost in the seal hunt. This event is a key element in the self-understanding of Newfoundland sealers and symbolizes the danger that sealers have to face every year during the hunt.
	- 1950/51:
	  o First harp seal estimate (~3 million)
	  ▪ Declining numbers of landed seals raised concerns over possible overhunting. Therefore, the first rough estimates on harp seals were conducted.
	- 1959/60:
	  o Second harp seal estimate (~1.6 million)
	  ▪ Numbers continued to decline and with more precise, overflight monitoring techniques a more thorough estimate yielded that the overall seal population was either lower than expected or had declined much more dramatically since the first estimate.
	- 1964:
	  o Artek film release ‘Les Grandes Phoques de la Banquise’*
	  ▪ A film shot by a French television station showed a seal apparently skinned alive during the seal hunt in the Magdalen Islands. Years later it was proved this scene was staged. It did not miss its symbolic effect, however, and around that time was the start of the anti-sealing movement after animal welfare and humane organizations picked up on the issue. The International Fund for Animal Welfare (IFAW) was founded in 1969 with the explicit aim to end the seal hunt.
	  o Seal Protection Regulations (SPR)

Identify disturbances or events that challenged, built, or reduced resilience or adaptive capacity in the system.	▪ The first Seal Protection Regulations were concluded. The SPR constitute the first comprehensive regulations that regulate the seal hunt and incorporate first animal welfare and population provisions. - 1972: o US Marine Mammal Protection Act (MMPA) ▪ The MMPA was concluded as a direct response to declining marine mammal populations worldwide and shut down markets for marine mammal products in the United States. While there has never been a significant market for seal products in the US, the MMPA de-legitimizing marine mammal hunts for financial gain. - 1982 o Founding of Canadian Sealers Association (CSA) ▪ The global campaigns to shut down the sealing industry was countered by the foundation of the CSA. While undergoing internal struggles from the very beginning, it aimed to become the spearhead of the counter-movement that aimed to debunk claims from the anti-sealing movement and to be the international representation of sealers and sealers' interest. The CSA has from the very beginning not been well-received by all sealers, and in 2015 it is considered to be the extended arm of the DFO rather than an interest group for sealers. - 1983: o EC Seal Pups Directive* ▪ Council Directive 83/129/EEC banning the trade of products stemming from harp and hooded seal pups in the European Communities was concluded as a response to conservation concerns of harp and hooded seals. While the Directive itself is rather concerned with population statuses, the preparatory works shows how animal welfare has entered the European political discourse on the seal hunt. Repulsion over hunting methods in the Canadian seal hunts are commonly reflected. However, products stemming from Inuit seal hunts were to be excluded from the trade ban. In spite of this exemption, Inuit and commercial sealing communities were struck extremely hard by this ban as Europe constituted the most important market for seal products. While initially set to be in force for two years, in 1985 it was extended to 1989, then it was extended indefinitely. - 1987: o 'Whitecoat' and 'Blueback' hunting ban in Canada ▪ On 30 December 1987 the Canadian government announced a ban of hunts on harp and hooded seal pups ('whitecoat' and 'blueback' respectively) in response to the European opposition to products

	from these. Although the population was on the rise again, the influence of animal welfare organisations led to the ban's adoption due to seemingly cruel hunting methods. - 1992: o Marine Mammal Protection Regulations (MMR)* ▪ The MMR constitute a sophisticated regulatory framework for seal hunting and other marine mammal hunts. The seal hunt is strictly regulated with sealing seasons, a licensing scheme and strict animal welfare requirements. The hunt for and commercialization of whitecoats and bluebacks is prohibited, while stringent requirements for the killing of seals ensure death of the animal before pelting. - 2009: o EU ban on trade in seal products* ▪ In September 2009 the European Union adopts Regulation 1007/2009 on trade of seal products, effectively shutting down all markets for seals in the European Union where the most important markets were located. The ban is considered to be a 'victory for seals,' but a detrimental blow to the sealing industry in Canada. The ban resulted in plant closures in Newfoundland, heavy price declines and an overall contribution to the decline in trade of seal products worldwide. Although Inuit are exempted through a more sophisticated system, commercial and non-commercial indigenous sealers have been struck hard because seal traders have abstained from the trade, irrespective of the products' origin. Through concerted, thus far unsuccessful, efforts to lift the ban (Canada and Norway challenged it before the WTO; seal traders, Inuit and others before the European General Court and Court of Justice) the seal hunt has gained more prominence. The ban is an important contributor to the refusal of the EU to become an observer to the Arctic Council.

3. Disturbances What are the key disturbances in the system (present and past)	a) Have there been major biophysical disturbances that are relevant for the case? The harp seal population declined dramatically until the mid-1960s. During the 1950s, the population declined from ca. 3 million animals to 1.6 million. Conservation concerns were therefore a key element in the 1972 MMPA and 1983 Seal Pups Directive (3). While in the first decade of the 20th century the harp seal population sharply increased, the latest data shows a leveling out. The IUCN foresees that climate change will have negative effects on harp seal populations in the future.	b) Have there been major social disturbances that are relevant for the case? The first protests concerning animal welfare in the seal hunts arose in the 1960s. Since then, the seal hunt has been under constant attack because of perceived animal welfare shortcomings, irrespective of the measures that have been taken to improve/professionalize animal welfare practices in seal hunts. Although some scientific studies exist, no long-term assessments of applied animal welfare practices have been produced. The major social disturbance has been the spread of information in the media. This constitutes as a driver of the subsequent disturbances (pressure and bans on sealing). For example, the claim that seals are often alive when gaffed on board a ship stems from the swimming movement of the seal after it has been shot. This so-called ‘swimming reflex’ is a nervous reaction that stems from a sudden destruction of parts of the brain. This is actually a sign that the seal is irretrievably unconscious. However, depending on this is presented (ie. documentary film), the hunter can appear to be ‘heartless’ and ‘barbaric’ if there is no explanation. Another misinformation regards the economic importance of the hunt. A common narrative is that it amounts to only 5% of the annual income of seal hunters and is therefore negligible and without sufficient justification. If markets for seal products are good and markets for fish products are bad, sealers have indicated that sealing can even make up to 50% of the annual income. Vice versa, as currently the case, sealing is indeed a rather small contributor to the annual income given that the seal markets are virtually non-

		existent. Given little economic diversity in remote communities in Newfoundland, every income-generating activity is welcomed. To this end, sealers, before going out to hunt seals, evaluate very carefully whether it is economically feasible to equip the boat (amounting to several 10-thousand dollars) for the seal hunt.

4. Drivers of change Clarify what impacts these drivers have on the SES and if these are direct or indirect	a) What are the key biophysical drivers of change? While not impacting the SES directly, climate change has entered the global discourse on the legitimacy of the seal hunt. Seal hunters themselves do not consider the seal population in danger of being negatively affected by a changing climate. To the contrary. Given the large numbers of seals, they are considered robust and prone to withstand changing environmental conditions. The discourse, however, considers melting sea ice as a key component in negatively affecting seal populations. To this end, public and conservation concerns relating to climate change play a role in delegitimizing the seal hunt**. Biophysical and social drivers therefore merge** to become an element of pressure on the integrity of the SES, irrespective of the measurable impact the biophysical change has on the SES (6).	b) What are the key social drivers of change? The main social driver for change is declining markets for seal products. All larger-scale seal hunts in Newfoundland and all work in the processing sector is dependent on external markets for seal products. If markets decline, the entire sector declines. With the start of the legislative process in the EU in 2006, global markets collapsed, leading to plant closures and a reduction in seal hunts with a commercial incentive. Given the decade-lasting effective measures to demonize the seal hunt and the sealers, abroad but also within Canada where support for the hunt is waning. As shown in (3(b)), social disturbances have been the most significant drivers of change.

5. Sources of adaptive capacity: What factors allow(ed) the system to adapt to disturbances in the past and present? Give a brief assessment of recent or on-going changes (+/-/0 = increasing/ reducing/ not affecting adaptive capacity)	a) Within the ecosystem?	b) Within society (e.g. people, social capital, management, institutions, infrastructure): A means to counter the ongoing pressures on the sealing industry in general have caused many to leave their home communities and seek work elsewhere - either in Newfoundland's capital St. John's or in mainland Canada, particularly in the tar sands of Alberta. Legally, the Canadian government has tried to adapt to the critique of low animal welfare by tightening animal welfare requirements in the MMR. While in originally only a reflex test was required to ensure the seal's death, since 2009 the 'three-step-process', the crushing of both sides of the cranium, the bleeding of the seal and lastly the skinning, has been made mandatory under the MMR. Furthermore, training for sealers before acquiring a license has been compulsory since 2009. Also the industry itself has responded to the pressures by requesting a freeze of the issuance of new commercial sealing licenses in 2006. This means that only assistant sealing licenses can now be issued, meaning that they can only work as deckhands and are not allowed to apply the first blow to the seal's head. Those with licenses before 2006 are still allowed to shoot (and sometimes club) seals. (6)
The next two sections break down the information in Section I. While it is not necessary to fill these sections, if you have additional information pertinent to specific rows below feel free to enter the material.		

II.1-8 SES, resilience and adaptive capacity		
	Biophysical	**Social**
II.1. Where do we find changes and resilience in the face of change?	a) Within nature	b) Within society Resilience measures can be found on a seal hunting boat and within the sealing industry/industry workers. The key component in this regard is cooperation and mutual support. For example, the abandonment of personal property on a seal hunting boat aims at generating highest efficiency in the light of environmental dangers and economic pressures. Calm conflict resolution and the avoidance of open conflict is an applied method to ease the conduct of the hunt. Furthermore, pre-hunt deliberation on where the different vessels of a community go makes the hunt most efficient for all boats involved. While technically there is competition, in practice the large numbers of seals allow for all boats to hunt sufficient numbers. The shift from commercially driven hunts to subsistence driven hunts in light of declining markets marks resilience of seal hunting (1, 2). In the sealing industry, similar methods can be found. In order to increase resilience, workers cooperate on all levels. Also the leadership in the last remaining plant engages actively in the smooth conduct of seal product processing while conflicts are resolved silently (6).

II.2. What are the system's key components?	a) Key Ecological components (e.g. lakes, coastal zones, caribou)	b) Actors in society (e.g. individuals, groups, public or private organizations)? How are people organised – by geography, livelihood, family, etc.? People are organized by family, profession/livelihood and geography. In the case of the seal hunt/fisheries, all boats are private businesses, in many cases run by family members (father and son; brothers) and manned by crews from the family itself and/or from the home community or close-by communities. It is rather rare (in the author's case unheard of) that a complete outsider (geographically) was part of the crew. In processing, people are organized by profession. While family and geographic proximity do play a role, it is rather the fact that they are workers in an industry under pressure that creates a unity among the workers. With changing conditions in the plant, this unity is more a by-product rather than a 'naturally' grown resilience measure (6).

II.3. What are the key linkages? E.g. ecosystem services, resource extraction. These linkages should exist. If there are not mutual links between social and ecological components the case is not a social-ecological system.	a) From nature to society (e.g. ecosystem services) Seal Fish	b) From society to nature – modifying nature, extracting resources (e.g. hunting, mining, water pollution) The main element of the case is the seal, the way it is hunted, the area's natural environment and the people hunting/processing it. The linkage between humans and the environment is therefore obvious. The linkage between the social and the natural is further exemplified by the incentives for the seal hunt. With good/revenue-generating markets the main incentive behind the hunt is economic benefit with subsistence elements being yielded as a 'by-product' for this type of hunt. Larger ships (longliners) with large crews spend several weeks at sea hunting seals. With collapsing markets, seals are still being hunted yet with more of the incentive of direct family sustenance. That means that the speedboat-based 'landsman hunt' for subsistence purposes becomes the main type of hunt. Commercialization of seal products occurs as a 'by-product' of subsistence (1).

II.4. What are key interactions?	a) What are the key ecological interactions within the case? b) What are the most important biophysical tele-connections to distant systems?	c) What collaborations, conflicts, or other key linkages exist between actors? In the case of the seal hunt this seems to be a rather clear-cut scenario as, very roughly, sealers and industry (and to some degree the Canadian government) are on one side while anti-sealing organizations, European and American politicians/politics are on the other. To this end, the CSA was founded, but internal power struggles, as well as non-acceptance by sealers, challenges and weakens this united stance. (6) d) Between local actors and distant actors? There is national and international collaboration between Newfoundland sealers/the Newfoundland-based sealing industry and other hunting and fur-trading organizations worldwide. For example, through the Fur Institute of Canada, as well as with the European hunting organization, FACE. Also, indigenous and non-indigenous collaborations exist, as best exemplified by the court cases before the European General Court and Court of Justice to overthrow the EU trade ban. It cannot be ascertained in how far this collaboration is sustainable and/or opportunistic, but at the time of writing both Inuit and non-Inuit seal hunters publicly voice similar concerns. Also on a governmental level Canada and Norway cooperate in order to defend the seal hunt/lift the EU trade ban. For example, the WTO Dispute Settlement Procedure, in which both Canada and Norway attempted to overthrow the ban through the WTO Dispute Settlement Body.

		The North Atlantic Marine Mammal Commission (NAMMCO) constitutes a forum for cooperation, however more on a scientific and political level. While Canada is not a full-time member, international acceptance for marine mammal hunts is fostered through this organization. (6)

II.5. Culture	a) How is the relationship between society and nature viewed? When talking about 'nature' in Newfoundland, it is primarily the sea that is referred to. Newfoundland's society is unimaginable without the sea and as a consequence reference to the maritime history is visible everywhere. After all, most of Newfoundland's communities are located by the sea. b) What meanings are attributed to nature and to interactions with nature? Nature is considered a provider and especially in fishing/sealing communities where the sea shapes feelings of belonging and a feeling of home. The sea is the key provider for the islanders and a significant moral determinant. The seal is only one out of many marine species that are harvested and utilized form the sea (1).	c) What are key cultural features of relevance for the case? Poems and songs encapsulate the importance of the sea for the island. Moreover, place names mirror the maritime past (and present) of the island. An understudied element is the different dialects in Newfoundland that have developed over the centuries. This development is due to the isolation of different English-speaking settlers caused by the inaccessibility of the different coves and bays having yielded numerous proverbs and sayings related to the marine environment (6). d) What are key cultural practices and beliefs related to nature? Music plays an important role in remote communities. Most songs that are played in rural workshops are based on the marine environment or maritime activities. This is, however, understudied and requires further investigation (6).

II.6. Disturbance What are important types of stress & shock	a) Describe important biophysical or ecological shocks and stresses (e.g. floods, storms, etc). Sea ice is a major determinant in the seal hunt. First of all, seals wean on the ice and spend much of their lifetime on it. Without sea ice, there are no seals. In recent years, many fishermen report an increase in sea ice, which is being taken to Newfoundland via the Labrador Current. Sea ice conditions change from year to year, directly impacting the physical ability to hunt seals. If sea ice is too strong it constitutes a natural barrier and does not allow for a larger hunt (as occurred in 2014). On the other hand, little sea ice causes the seals to be too far away from the Newfoundland shore, rendering a larger hunt economically unfeasible. (6)	b) Describe important social shock and stresses (e.g. austerity policies, changes in government policy, introduction of new technologies, etc) Two elements fall into place here: One is the strong fluctuation in the markets for seal products, resulting in less income for sealers and loss/change of employment for industry workers. The other are changes in the MMR and their enforcement, which is considered unreasonable and driven by outside forces. Government policies as enforced by the DFO are therefore not received positively. (6)
II.7. What are key slow variables Changes that occur over decadal or longer time scales	a) What types of ecological processes (e.g. loss of permafrost, shifts in species composition) are driving important long-term changes in ecological structures and processes? Climate change must certainly be mentioned here although its direct effects on seal populations are not fully known.	b) What types of slow social processes (e.g. aging, population growth, loss of language) are driving important changes in social institutions and behaviours? Outmigration of young people from remote communities and associated ageing of the population constitutes a constant stress factor. With it comes the closure of schools and therefore a decline in economic diversity in the region. As a consequence, the social capital in remote communities dwindles (1).

II.8. Relationships with ecological regime shifts	a) Are ecological regime shifts driving further ecological change or pressure? b) Are external or internal ecological dynamics potentially or actually producing ecological regime shift(s)?	c) Can social stresses or major changes be attributed to ecological regime shifts? d) Are there specific social practices that might be contributing to ecological regime shifts
II.8 Regime shifts	**If a regime shift exists and is important to this case describe it below.** Please indicate whether the regime dynamics are well-established, contested, or speculative.	
II.8.a. Detailed description of alternate regime shifts A case study can contain more than one type of regime shift	Briefly describe the structure of each regime. What does each regime look like? What are differences in ecosystem structure and function? (e.g. permafrost loss, vegetation change)? How do the properties and behaviours of regimes differ? e.g. collapse of subsistence food sources, fundamental change in types of livelihoods, change in governance institutions, new actors with significant political power who transform decision making)	
II.8.b. Feedback mechanisms within the system that maintain each regime	Ecological feedback mechanisms	Social feedback mechanisms

II.8.c. What key changes drive regime shifts? Describe how these changes alter the state of the system or feedback processes.	a) Drivers of ecological regime shifts (either social or ecological). b) How do these changes alter biophysical feedback processes?	c) Drivers of social regime shifts (either social or ecological). d) How do these changes alter the social feedback processes?
II.8.d. Ecosystem services substantially impacted by regime shift	a) Changes in ecological processes that produce ecosystem services	b) Changes in demand for ecosystem services (market and non-market) c) Changes in the institutional context of ecosystem services e.g. changes in access and changes in how ecosystem services are valued as expressed by rules and regulations.
II.8.e. What is (+/-) impacted by changes in ecosystem services directly or indirectly	a) Impacts from regime shift on ecological components	b) Impacts from regime shift on social actors
II.8.f. Potential cascading effects	Describe, if any, the likelihood of potential ecological cascading effects to other SES	Describe, if any, the likelihood of potential social cascading effects to other SES

II.8.g. Where do actors intervene to alter regime shift dynamics and who can do the intervening?	Ecological oriented interventions	Socially oriented interventions

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GLOSSARY OF TERMS IN THE TEMPLATE

Actor	We use this term generally to look for individuals, groups, organisations, and so on that structure actions and/ or are stakeholders.
Adaptive capacity	Is the capacity of actors in the system to manage resilience in order to stay within a desired state during periods of change. This is related to the diversity in the system behind the provision of a function.
Disturbance	This refers to any disturbance to the system, regardless of scale, duration, intensity and frequency. See shock and stress.
Driver	Actor or process that directly or indirectly affects change in a social-ecological system. External means that the system in question (the scale being looked at) is unable to affect the driver in question – there is no feedback from the system to the driver.
Ecosystem services	The goods and services humans derive from ecosystems. These include: provisioning, regulating, cultural ecosystem services respectively.
Feedbacks	A change within a system that occurs in response to a driver, and that loops back to control the system. A feedback can help to maintain stability in a system (negative or balancing feedback), or it can speed up processes and change within the system (positive or enhancing feedback). Feedback processes play a very important role in determining system thresholds and in maintaining system resilience.
Institution	Here we refer to the humanly devised constraints that shape human interactions, such as rules, norms and laws. These can be formal or informal. Note that we are not referring here to institutions as organisations.
Regime shift	For complex systems, a substantial and enduring reorganization of the system, where the internal dynamics and the extent of feedbacks undergo change.
Resilience	This is a property, in this context of social-ecological systems. It relates to the capacity of a system to cope with disturbances and recover in such a way that they maintain their core function and identity. It also relates to the capacity to learn from and adapt to changing conditions, and when necessary, transform.
Shock	A sudden, unexpected disturbance. This kind of disturbance is often punctual, and has important impacts on large parts of the system.

Slow variable	When analysing complex system is often useful separating “fast” and “slow” variables. Fast variables often represent the primary concern of ecosystem users, for instance game or crop production. Slow variables shape the behaviour of fast ones but change slowly with respect to the overall dynamics of the system. Examples of slow variables might include permafrost thawing for a social-ecological system of Arctic hunters where the fast variable is game, or soil organic matter for an agricultural system where the fast variable is crop production.
Stress	This is a disturbance that has long persistence and often low intensity in impact.
Social-ecological system	This is an interwoven system of human societies and ecosystems. This concept emphasises that humans are part of nature and that these components function in interdependent ways. In the template identifying these interactions between the components aims to identify the processes and actors/ components that interact and particularly the feedbacks between the human-related components and the ecosystems/ biophysical components.
Stakeholder	See “actor”
Systems Diagram	This is using a diagram to illustrate the configuration of a system. This is done by defining its structure, function, and feedbacks. For a case there may be more than one diagram if the system changes in character (actors, processes, drivers, disturbances, feedbacks etc.) over time.
Timeline	The goal with the timeline is to capture important events – both punctual and over longer periods of time, identifying the causes of these events and the actors/ processes involved. This should be done chronologically and distinguishing events.