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# Being well-governed: Including inspectors in a systems approach to fisheries management

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**Abstract** Based on 18-months of ethnographic fieldwork in South Africa's Western Cape province, we suggest ways in which marine resource law enforcement activities can be evaluated at the level of individual fisheries compliance inspectors, to gain a more accurate understanding of the state of marine resource law enforcement. We show that these individual assessments can be scaled up to speak about specific compliance stations, and further, that these local-level assessments can be scaled up to the regional and provincial levels, without losing sight of the needs and value of the individual inspector. This paper contributes to the broader conversation on compliance in marine resource governance, as well as opening a new avenue of discussion: how to incorporate inspector-focussed social indicators. We show that this can be done in ways that take the overlap of the ecological, economic and social dimensions into account, while still being practical in terms of application and evaluation.

**Keywords** Compliance · Fisheries systems · Human dimension · Marine governance · Well-being

## INTRODUCTION

Through 18 months of anthropological fieldwork observing marine resource law enforcement in the Western Cape, South Africa, ethnographic data were collected and examined with the purpose of writing an account and analysis of what marine resource law enforcement looks like when it leaves the pages of acts and policies and takes to the beaches and jetties. What happens when the authority to govern is vested in a person and not a text, especially when that authority is then imposed on another? By looking at actors and their relationships to each other, *and* to both the governing (the Fisheries Branch) and to-be-governed systems (the fisheries-related marine social-ecology), the data describes the diversity, complexity, dynamics and scales (Jentoft and Chuenpagdee 2009) of marine resource compliance activities in the region. We argue that marine resource compliance is over-simplified when it is considered to be simply the application of legislative content. This sets it up to fail. Its messiness is not something to be solved, but an important feature to account for when thinking through solutions.

There has been much research internationally and in South Africa, based on ethnographic fieldwork, in relation to fisher behaviour and decision-making (Ommer et al. 2007; Hauck 2008; Duggan et al. 2014; Cepić and Nunan 2017). What this body of research has shown, is that fishers have a range of factors that contribute to their decision-making, not limited to purely economic considerations. In terms of illegal fishing, the decision to poach is not always only a consequence of greed—they may be choosing food security over legality, or may not recognise the legitimacy of the legal categories applied at all. The point, here, is that fishers' intentions and decision-making processes have successfully been studied using the ideas of relationality and complexity, and the findings that these studies have produced have, overall, created a more accurate understanding of how fisheries work—or why they stop working. The rationale behind this type of argument is that such an approach is ultimately a more accurate and just representation of resource users.

We agree, and argue that it should be extended to that other category of person *also* dependent on the fisheries complex for their livelihood and well-being: the compliance inspector. To this end, we include ethnographic 'anecdotes' in the body of the text; we wish to centralise the person and body of the inspector as central to the



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**Box 1. Ethnographic anecdote #1: Examples of violence**

Sometimes, the cartels from Hawston will come into Gansbaai in convoys of 4 × 4 vehicles that carry up to 180 poachers. According to the inspectors, they will then take over a beach and poach in the open. If a patrol were to find them, usually one or maybe two cars (2–4 inspectors), the inspectors would be completely overwhelmed by the number of poachers. Even if all 22 of the station's inspectors were to be there at the right time and place, the vast numbers of the poachers and the threat of violence means that the inspectors are effectively incapacitated. These are considered by the inspectors to be the most dangerous poachers, as those who poach at night are risking injury trying to not get caught. Those who poach during the day, however, do so because they are prepared to defend themselves. Countless stories were told about fire fights in the dunes and on the beach, as inspectors chase or flee from poachers. These battles are fought with tactics similar to guerrilla warfare. This includes targeting of specific individuals in their homes or cars, from both sides. One inspector had lost two cars during his time in Gansbaai—one government vehicle had been totally wrecked in a car chase, and his own private car had been torched in his driveway.

Paternoster, too, is a frequently violent space. One particular day, it was clear that several boats had gone out, despite the fact the Interim Relief permits for Paternoster had been cancelled for the year. This, according to the letter of the law, meant that every boat that went to sea was automatically regarded as a poacher, even if innocent of the alleged crime that had caused the permit cancellations. However, when the inspector was asked if he was going to get out to ask any questions or take down license plates, the inspector laughed again and said no, he couldn't risk it—there was a strong possibility that we could get mobbed or have rocks thrown at us. The inspector explained that the town used mobbing action to prevent the inspectors, or indeed any law enforcement, from interfering with the poachers. From their various vantage points, the lookouts and fishers can see what is happening on the roads coming into Paternoster and on the beach. If it appears that the inspectors are "making trouble", they send out the call and several hundred people (men, women and children) can be surrounding the inspectors within minutes, harassing and threatening them. The beach is essentially a no-go area for the inspectors, unless they have sufficient back up. Even if the other four or five inspectors from St Helena Bay were to make it to Paternoster in time, six would still be inadequate against a hundred or more community members.

functioning of the fisheries complex, showing that their daily inter-personal and physical experiences can usefully be incorporated into not only evaluating the efficiency of law enforcement, but in providing the detail needed for a comprehensive systems-focussed approach to fisheries governance. We draw on Jentoft and Chuenpagdee (2009) to show that fisheries compliance is a system-within-a-system that contains diversity; that is complex and dynamic; that looks and acts differently at different scales. What we have done, essentially, is turn ethnographic anecdotes (Boxes 1–5) into indicators of systems functioning, so that they may inform the governance and evaluation of the fisheries. The ethnography is drawn from South Africa and may be site specific; the approach and methods are not.

The acknowledgement of messiness and the need to incorporate it into fisheries management, allowed for the turn towards systems-thinking in global fisheries science and studies. There are several names for such a systems approach. South Africa has committed to implementing the Ecosystem Approach to Fisheries (FAO 2003). In South Africa, fisheries management is the responsibility of the Fisheries Branch of the Department of Agriculture, Forestry and Fisheries (DAFF), a government ministry. Within the Fisheries Branch, law enforcement falls under the Compliance Directorate, which itself falls under the Chief Directorate Monitoring, Compliance and Surveillance (MCS). Compliance inspectors have much to teach both the Fisheries Branch and Compliance Directorate management in terms of social and economic aspects of the Ecosystems Approach to Fisheries, and the practicalities of good governance in the sector.

As a framework for fisheries management, the Ecosystems Approach to Fisheries (EAF) is a purposeful and dramatic departure from the previously dominant regime of Target-Resource Oriented Management (TROM) in the field of marine fisheries management. TROM is a term that has been 'constructed to refer to conventional fisheries management' (FAO 2003), approaches that failed to take a systems view of the marine ecology by focussing instead on the stock of a specific target resource, often in isolation to other ecological or social relationships or processes. TROM approaches have been blamed for a number of failures in fisheries management, as they are known for "treating wicked problems as if they were tame" (FAO 2003; Jentoft and Chuenpagdee 2009, p. 559). Systems approaches to fisheries, instead, are an acknowledgement that fisheries are anything but tame; they attempt to engage

**Box 2. Ethnographic anecdote #2: Uniforms and equipment**

There are moments in the fight against poaching when success comes down to what shoes are worn. Most divers and lookouts are young men, and so have youth and fitness over the inspectors who are, on average, older and less fit. Poachers are often barefoot, or in running shoes, so are more sure-footed as they flee over uneven ground. It is not for nothing that the officers on the ground are referred to as the 'foot soldiers', and as such the most basic material support one could give them would be appropriate footwear. After observing the range of shoes worn by inspectors, I asked why some wore leather boots and some canvas boots, while others wore different kind of more everyday lace-ups. I was told that not everyone was around when the leather or canvas boots had been issued, and so had missed out, or that the shoes had broken and had yet to be replaced. Several faults with the standard issue boot were pointed out to me. First, they were of canvas, and therefore not waterproof. Second, the soles were of a rigid plastic, which the inspectors explained to me did not do well on uneven, slippery surfaces. The inspectors work on wet slipways, harbours and boats. They need to be able to run if necessary, over seaweed and rocks, through sand, giving chase after poachers. They need to be able to climb on to and off boats, sometimes quickly. If their shoes are not waterproof, with slippery soles, it not only makes their job more difficult, but also more precarious. One inspector up the West Coast told me that he had waited months for his standard issue shoes to be delivered from Cape Town. When they failed to come, he used his own money to buy a pair of shoes that were neat and appropriate, and within his price range. When a senior official from Head Office came for a station visit, or inspection, the inspector was criticised in front of his peers for not having the right footwear, and for looking unprofessional. The inspector in question told me he did not argue for fear of making the situation more awkward.

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Whether doing boat inspections, foot patrols or vehicle patrols, the inspectors spend a large amount of time exposed to the sun and elements. For example, inspections at Miller's Point, which means either sitting in the car in the sun, or finding some shade on the gravel slope that separates the parking lot from the thick bush on the slope above—often for hours at a time. The shade offers little comfort, as one must perch on rocky ground. If one needs to use the toilet, then it means either the bushes, or asking at the clubhouse, but the clubhouse is not always open, and is 'reserved for members only'. By counting the number of trailers in the parking lot, one can tell how many boats are out. The inspectors will wait until every boat is in before leaving, but there can often be up to an hour between boats landing, while waiting in the heat. The sun is a significant feature in the work of inspectors. Many inspectors bear lines around the eyes from squinting for too long, the sun clearly causing strain on them. Like shoes, appropriate head- and eye-gear should be a standard health and safety issue, as it is with marine law enforcement agencies in countries such as the United States and Australia.

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The Arniston, Stilbaai and St Helena Bay Stations all had telecommunications problems during my times in the respective sites—in all three, the internet was not working, and neither was the fax machine in two of the sites. When telecommunications difficulty is experienced at a station like Kalk Bay or Kommetjie there is not much of a crisis as they are close enough to the other stations and Cape Town to deliver their reports physically to Head Office. In Stilbaai, the situation is more complicated—their internet was not working during both of my field visits, and the fax machine could not be used during my second visit (February 2012 and January 2013, respectively). Stilbaai is about a 3-h drive from Cape Town and so it was not feasible to drive down the reports every time. The inspectors did not want to courier the documents down as they would have to pay out of their own pockets and wait to be reimbursed from Head Office, which has been known to take months.

all actors involved in the system on the basis of acknowledging messiness.

While the messiness of the fisheries context is conceptually recognised within the EAF framework, for purposes of implementation, an emphasis on three distinct dimensions is reverted to: ecological well-being, human well-being and ability to achieve (FAO 2003; Paterson et al. 2010; Shannon et al. 2010; Okes et al. 2012). Practitioners and researchers of EAF in South Africa have done much work in researching the indicators of each and the links between them, through dialogue and focus groups with stakeholders in a process that addresses social and ecological problems as interlinked, and dependent on a context of good governance (Paterson and Peterson 2010; Paterson et al. 2010; Shannon et al. 2010; Sowman 2011; McGregor 2015; Jarre et al. 2018). Ability to achieve is the phrase

**Box 3. Ethnographic anecdote #3: Interpretations and authority**

In November 2011, the new recreational West Coast Rock Lobster permit conditions had been published. Before, it stated that so many lobsters may be caught; now it stated "may be caught or collected". A group of lobster fishers operating out of Kommetjie, managed to interpret this new wording in their favour. The inspectors had observed that there were some people waiting on the rocks, on the approach to the slipway, who took bags of lobster off the boats before they landed. When confronted by the inspectors, they argued that they were "collecting" their four as stipulated in the permit conditions. When the inspectors pointed out that lobster may not be bartered, sold or traded, they pointed out that nothing had been exchanged—they had merely retrieved their lobster. Since they had permits, and the boats officially landed their legal catch of 20 per boat after these exchanges, and there was no way for the inspectors to prove that money or goods had or would exchange hands in payment for catching the lobster, they had to let them go with verbal warnings.

One day while doing a vehicle checkpoint, we searched some recreational divers who had caught some lobsters. Everything was in order, but while they were checking the lengths of the lobsters, [the first author] noticed that one of the lobsters was a female with some small nodules on the underside of her tail. I knew that it was illegal to take lobsters "in berry" (carrying eggs), and so pointed this out to the inspectors and fishers. The fishers said no, that's not what berry looks like, the eggs are bigger and darker. The inspectors were unsure, and they tried to find an official DAFF image of "young eggs" to compare it to, but could not do so in the annual DAFF Marine Recreational Activity Information Brochure that illustrates this permit restriction. All the photos in the brochure were of eggs in the very late stages of development, so they could not conclude the question in the affirmative or negative—or not in a way that would satisfy the fishers. The resort was out of Internet data service range, and so they could not compare it to pictures on the web using our phones. Only later, in a UCT library, was [the first author] able to confirm for herself they had indeed been in the early stages of "in berry".

In December 2011, the inspectors searched a sedan driven by a single man, with no fishing equipment but two large hake. He had neither a fishing nor fish transport permit, but was indignant that the inspectors should be asking him (he claimed the fish was a gift). As he could not provide proof of this, he then started to argue with the inspectors. One inspector took out her dictionary-thick A4 copy of the Marine Living Resources Act and relevant permit conditions, in order to read the conditions to him word for word. While his general belligerence was noteworthy as an example of the attitude often displayed towards inspectors by fishers, many of his comments directly questioned their authority—based on their consulting of the MLRA and permit condition texts. His opinion was that if they did not know the law off by heart, they did not know it well enough to enforce it at all—there is the expectation that the inspector must know every clause and permit condition off by heart—as if the ability to recite is what gives them the authority to enforce.

used to describe a range of issues that relate to governance, specifically potential barriers or enablers for implementing current or future systems management. Good governance is considered to be an enabler; to be able to achieve, the system must be well-governed.

Therefore, in the EAF framework, governance falls under the "Ability to Achieve" category. It is objectified and evaluated according to a range of core issues, identified differently in each of the relevant fisheries according to the objectives identified by stakeholders and working groups. Within the governance category, are a range of issues and objectives that relate to implementation.

This contribution builds on this approach using the review process of the EAF Ecological Risk Assessments (ERAs) (Nel et al. 2007; Petersen et al. 2010) as the tool with which to incorporate the social science of ethnographic research with the natural science bias of EAF research, which explicitly asks for and accommodates such social data (Paterson et al. 2010). This is part of a global trend to counteract such biases, by incorporating rigorous social data into more natural science projects or frameworks. It is an acknowledgement that people, too, are part of these systems.

The act of enforcing fisheries regulation falls to local contingents of Senior Marine Compliance Inspectors (inspectors), based at stations in sites of significant fishing activity. The inspectors are central to the implementation of fisheries management. However, despite the importance of the paradigm shift and the political commitment to implement an EAF approach, the Compliance Directorate of South Africa's Fisheries Branch is not actively involved in any policy or protocol formulation in terms of EAF—they are central to good governance, but are not part of the formulation of departmental policy, generally (Hauck 2008; Okes et al. 2012; Norton 2014). They oversee the design of compliance activities, but within the constraints of their

**Box 4. Ethnographic anecdote #4: Evidence**

Inspectors in Cape Town, the West Coast and Gansbaai complained to me about having to prove their integrity before proving another's guilt. The inspectors make seizures and arrests but are then required to hand over the case to the South African Police Service or the Special Investigating Unit, depending on the details. They do not investigate further themselves. Additionally, the cases are often heard by judges or argued by lawyers who have little knowledge about marine resources. Many inspectors have testified in court that, for example, they saw the accused with abalone before he tossed the contraband back into the sea. I was told that the standard response by the court (judges and counsel for the defendant) to such testimony would be to question the inspector on how they knew it was abalone, and not something else. One of the inspectors in Gansbaai told me he "couldn't believe" the judge thought he didn't know the difference between abalone and alikreukel. The judge was not only questioning the inspector's judgement at that moment, but also his knowledge and personal and professional integrity. Even if they have the bag that the abalone had been in (as it was in this case), the department does not always make funds available for the basic forensic testing needed to verify that the contents had been abalone. In this way the inspectors are silenced, and not given the space to speak. Access to the appropriate technology—that of forensic testing—is denied due to lack of capital, and the expertise of the inspector as such is rendered illegible. Whereas large confiscations are often forensically tested, there is not enough capacity to test all confiscated fauna or fishing gear, and so these apparently smaller cases of offences are under prosecuted and, over time, scale up to be a major problem.

**Box 5. Ethnographic anecdote #5: After-effects**

Even without family ties to the fishing communities in which they live (which is common), the home lives of many inspectors are affected by their jobs. The inspectors generally work 8-h shifts, but it can be that a shift will run on into the next one. If an inspector works night shift (18:00–06:00) and only makes "the bust" at 05:00 or later, they must stay on shift until all the processing is complete. This may take several hours. Often inspectors in the hotspots might only have 6 h or less between shifts. Things can get so busy that they stay on duty for up to 16 h. This impacts on the inspectors' ability to do their jobs, bringing them physical strain as well as the strain of dealing with family life. Many inspectors with partners and/or children living in Gansbaai spoke of how much their partners complained about the job. If they get a call—even if they had only been home for 2 h—they would go out. One inspector told me he had not had a meal with his wife in a week and had barely seen his baby girl awake in that time. Their families know the dangers they face, and fear for them when they hear gunshots in the distance or must wait for them when their return is overdue. The danger is not carried by the inspector alone.

mandate to enforce, primarily, the Marine Living Resources Act (#18 of 1998) (MLRA). Therefore, while the design of fisheries management may take an EAF approach, this approach is not communicated to Compliance or its inspectors as a paradigm for action. Their mandate remains unchanged in that regard, and so their duties are designed outside of the EAF paradigm. While they are placed under the category of governance, their duties are better described as law enforcement, which indicates their distance (real and conceptual) from the upper level of management and more closely accounts for the tasks they perform daily—which have much less to do with ensuring compliance than they do with penalising transgressions.

The Ecological Risk Assessment (ERA) reports published by Nel et al. (2007) and Petersen et al. (2010) evaluate the state of South Africa's major fisheries, as well as their management and social impacts, according to the framework of the Ecosystems Approach to Fisheries. The ethnographic research has shown that the indicators linked to compliance in the first iteration of these ecological risk assessments, do not accurately account for differences between governance and enforcement, nor do they accurately portray the difficulties encountered by inspectors. What our discussion shows, is that the evaluation of the duties and position of marine compliance inspectors does not sufficiently take into account the nature of the job as experienced on the ground, and as such are not representative of the day to day realities of fisheries management (which occurs on the ground, between people, and not in the lines of text that constitute Acts and plans of action). In this paper, we offer 'enforcement' as a new category under Ability to Achieve, as well as a suite of objectives we

consider vital to accurate assessments of the state of marine resource law enforcement, using the jurisdictionally discrete fisheries compliance station as the unit of evaluation.

While social data are resistant to incorporation into frameworks primarily concerned with quantifying values, precisely because they are representative of the messy complexity of entangled lives, this is not reason enough to resist addressing it in this framework. It has been noted where the social issues in question are not amenable to incorporation into the said framework, and further, it has been noted how these issues should be further researched. However, given the urgency of the addressing the shortfalls in fisheries management in South Africa, we urge that triage priorities need to be applied. We have, therefore, included these more socially complex issues in this contribution, even if we were unable to attribute measurable indicators to them, lest they be ignored.

A set of objectives and linked indicators is suggested that may be used to identify and assess shortfalls in marine resource law enforcement, which in turn impacts 'ability to achieve'. This approach is based on local experiences, but is in line with work being done internationally, where social scientists are contributing to a systems approach to management by investigating indicators of social well-being among fishing communities. Examples of such work are the work of the National Oceanographic and Atmospheric Administration (Colburn and Clay 2012; Jepson and Colburn 2013), International Council for the Exploration of the Sea (Stephenson et al. 2017) and the Social Wellbeing Indicators for Marine Management (Hicks et al. 2016; Breslow et al. 2017; Charnley et al. 2017) (see also Hall-Arber et al. 2009; Barclay 2012; Johnson et al. 2014). However, the focus of this paper is shifted slightly from the focus of these groups' research, which has mostly been on communities and groups involved with fishing and an emphasis on coastal living. This paper contributes to that broader conversation, as well as opening a new avenue of discussion: how to incorporate well-being and social indicators into the "ability to achieve" dimension in ways that take the overlap of all three EAF dimensions into account, while still being practical in terms of application and evaluation. In our work presented here, we make the case for evaluating governance with a view on people as well as on processes, and question the degree to which the ability to achieve dimension of EAF *can* be designed on the basis of ethnographic data.

## THEORETICAL FRAMEWORK

Fisheries science and management are concerned with quantifying and regulating complexly dynamic systems that have no definite boundaries, concern a multitude of species (including humans), and that influence and react to a wide range of factors that, on first glance, might seem entirely unconnected to the act of catching a fish. Governing these systems is difficult. The complexity, dynamism and uncertainty inherent in fisheries has earned them the description as "wicked problems", explicitly in reference to their governability (Jentoft and Chuenpagdee 2009). A problem is considered wicked when it is "difficult to define and delineate from other and bigger problems" (ibid., p. 553), posing limits on the governability of fisheries and coastal systems that pertain to "the system-to-be-governed but also the governing system and governing interactions" (ibid., p. 559). Jentoft and Chuenpagdee conclude that:

> …The governing system, the system-to-be-governed and the governing interactions are *where* to look, the diversity, complexity, dynamics and scale of these systems are *what* to look *for*, whereas the components, relationships, interactions and boundaries are *what* to look *at*. (Jentoft and Chuenpagdee 2009, p. 559)

A core feature of fisheries governance, or governability, is compliance, which encompasses attempts to incentivise regulation-compliant behaviour and penalise non-compliant behaviour. Specifically, we are addressing the feature of compliance that penalises non-compliant behaviour such as illegal fishing and/or poaching: law enforcement. The law needs only to be enforced onto others when it has been transgressed. It is transgressions, not compliant behaviour, that help render fisheries wicked.

This paper is premised on the understanding that law enforcement in fisheries management is, as in the quote above, an issue that encompasses the governing system, that which must be governed and the interactions between the two. Specifically, in terms of governance, it far less to do with fish (or fish behaviour) than other areas of marine resource management: we argue in this paper that compliance and law enforcement centralises people and relationships as core areas of concern. However, the centrality of people to this process is often overlooked when marine resource management is being evaluated. By underplaying the role that individuals have on the system, evaluations of barriers and enablers to successful governance are often inaccurately or inefficiently described. This paper contributes by correcting for this oversight.

The inter-disciplinary theoretical framework that informs this paper draws from three bodies of work. First, it utilises the approach of the EAF, considering the fisheries context as consisting of three equally important and interlinked dimensions: ecological, human and ability to achieve (FAO 2003; Paterson et al. 2010; Shannon et al. 2010; Okes et al. 2012). The human dimension consists of both social and economic factors. This framework aims to consider actions in the fisheries complex as related to, formed by and influencing all three

of these categories. It is one way of looking at fisheries, and there are others, but considering that this paper aims to contribute to current ways of evaluating the implementation of an EAF, we have used and amended these categories in our work.

Our analysis parallels EAF's focus on systems by considering categories of people (fishers, inspectors, managers) not as simply their behaviour-derived labels, but as members of a social ecology that are in dynamic relation to one another as they strive for their own, and sometimes the resource or system's, well-being.

Well-being is a central idea in the philosophy behind the design of the Ecosystems Approach to Fisheries (EAF). It is a central concept in our work, not only for the way it features in EAF, but also for its centrality to the decision-making processes undertaken by fishers and inspectors. Central to well-being in EAF and to the experiences of fishers and inspectors, are relationships, as noted by Ommer and Team (2007):

> The health of communities and the environment is not merely the absence of morbidity/mortality and social dysfunction. It extends to those interactions of communities with their environment in ways that sustain quality of life and promote resilience … processes operating within social, environmental and cultural contexts that have interdependent relationships and feedback effects, and also causal complexity. (Ommer et al. 2007, p. 18)

The importance of human health and well-being is directly addressed by both South Africa's Bill of Rights (Section 24) and the Fisheries Branch mandate, as is the need to protect the marine resources and ecology. While both deal with the issue of health, they nonetheless emphasise assumed distinctions between the ecological and the social. By addressing these two notions of harm separately, the distinction disallows addressing ongoing processes of relationality that hold the assemblage together.

The recognition of the social-ecological entanglement of well-being, was informed by the second body of work which informs this paper's theoretical framework, that of environmental anthropology in general and the literature on human-nature relationality in particular. The field of environmental anthropology is well established and growing, with the theme of relationality featuring significantly both in terms of problem description, data collection and data analysis (Ingold 2002; Castree 2003; Latour 2005; Stengers 2005). Significantly, part of this broad discussion takes places under the banner of the emergent field of multi-species ethnography, which is relevant to the fisheries context as it asks the researcher to not only consider the ways in which human inter-personal relations formulate contexts and possibilities, but also considers the way in which non-human beings (e.g. linefish) and inanimate objects (e.g. the Marine Living Resources Act) influence or are influenced by these relationships in turn (Haraway 2016; Kirksey & Helmreich 2010). This body of work formed the bulk of the theoretical framework that in turn informed the ethnographic fieldwork and inter-disciplinary analysis on which this paper is based.

This focus on multi-species interactions and relationality allows us to address the systems not as marine, social or ecological, but to consider it as a network of relationships (described not perfectly, but sufficiently, as marine social-ecological systems). By premising our understanding of this network as unbounded, it made the conceptual work done by actors in this network to create boundaries more tangible and amenable to analysis. What relationships are lauded, claimed or acknowledged? Which are resented, obscured or denied? These questions went some way in describing the different perceptions individuals might have on the same situation or issue.

A common trait of both quantitative and qualitative data is an awareness of scale. Both of these processes of information compilation require that the researcher and analyst to be aware of the issue of scale and how it will influence their ability to speak to either a larger or smaller scale. We here analyse a set of site-specific ethnographic data to inform a template for evaluation that is relevant to the local scale but structured in such a way that it can be scaled up to inform a regional or even national evaluation of a system or cluster of systems. There are several negotiations of scale relevant to this paper: between institutions; between the different fisheries, and different sites; between the inspector, the station, the Directorate (Compliance), the Branch (Fisheries) and the Department (DAFF). These negotiations can take the form of either *practical* considerations of scale (how can one station refer to the region?), or *political* considerations of scale (at what level do we seek accountability for the failures of the Compliance Directorate?).

## MATERIALS AND METHODS

This paper is based on 18 months of ethnographic fieldwork conducted in nine different sites along the Western Cape coast of South Africa (Fig. 1), which included over 50 shifts that lasted between 3 and 8 h each. Some of these shifts were spent with one inspector, some with up to four at a time. MN was embedded with the 'units' of marine compliance inspectors based at the Compliance stations in those sites. We use the word 'unit' to refer to the team of personnel that populate a station or office, following the language of the inspectors themselves. Access to these units was granted through a detailed negotiation between the researcher and DAFF, which required the intent of the research to be communicated clearly to DAFF management and to the inspectors. The intent was described as exploratory, as interested in the broad question of how inter-personal relations affect the efficiency of law enforcement in the fisheries complex. It was agreed that the


**Fig. 1** Regional map of MN's field sites (red dots) in the Western Cape, South Africa

researcher would observe the functioning of the inspectors by interviewing them formally in their places of work, as well as informally through conversation and observation during their work activities. Observations were participant in that the researcher was physically in the sites and present for the inspections, requiring her to experience many of the same situations as the inspectors do on a daily or regular basis. The researcher spent their time participating and/or observing marine resource law enforcement in all its various forms: patrols by car and foot; boat inspections; observation posts over poaching hotspots; customs inspections; restaurant, storage and processing facilities inspections; permit checks; the production of paperwork. At times, she participated more actively than simply being present, by climbing onto boats or into freezers, by helping to count dried abalone in Customs hangars at the regional airport, or by being engaged and questioned by resource users during inspection activities. Data were collected in the form of: protocols and mandates for action as contained in legislation and the Compliance section's codes of conduct and directives; inspectors' perceptions and experiences through interviews and conversation; observations of the manner of their interactions with resource users; the enactment of mandate and protocol in the process of inspection and penalisation.

In analysing this data, they looked at how the job is presented or described in text, by law, by compliance management, by the inspectors themselves and by fishers. She then compared these to discover that there were significant mismatches between these descriptions. Next, the observations of bodies, relations, movement, infrastructure, technology, training and material resources were interrogated to see if these mismatches could be found or traced through to the 'reality' of marine resource law enforcement on the ground. It was found that mismatches between how the job is conceived and how it is performed, are significant and varied, and that these mismatches influential on the performance and outcome of marine resource law enforcement.

With this dataset, we then compared what the ethnography was telling us to the pictures that the ERA's portrayed of the same processes. We reviewed the ERA processes and reports, to make the most of their usefulness while attempting to reimagine them in a way that would allow for the incorporation of the social relations and dynamics. Importantly, the awareness of inspectors-as-people and the integral role they play in carrying out the Compliance Directorate's mandate, was not translated or made visible by the categories and choices presented by the ERA structure of categories.

Two fisheries were focussed on, chosen for their centrality to the completed fieldwork: handline fish and West Coast Rock Lobster (WCRL). The related reports were analysed to identify issues noted that either related to

governance and/or enforcement. The indicators associated with each were interrogated according to the ethnographic data to gauge what aspect of enforcement they were measuring and whether these measurements were accurately describing the processes they were designed to. Value trees were then constructed following the methodology by Jarre et al. (2008) and Paterson et al. (2010).

## RESULTS

Our results are presented below in the form of objective hierarchies that focus on marine resource enforcement in the Western Cape (Tables 1, 2, 3, 4). Figure 2 represents enforcement at three levels: provincial, unit, community. We are introducing an explicit category under Ability to Achieve, Enforcement, which allows us to discuss boots-on-the-ground issues that were not covered by the objectives and issues raised by the previous formulation of the governance section in both the ERAs and ERA reports. Figure 2 provides an overview of the context, while the Tables 2, 3, and 4 drill down on site-specific objectives under the new category "Good Enforcement". Table 3 presents the body of inspector as integral to enforcement success.

The evaluation can be repeated for each relevant station (of which there are 20 in the Western Cape), and the evaluations aggregated (using methods of incorporating partial truths or "fuzzy logics" into decision-making systems, as discussed by Jarre et al. 2008) to reflect the state of enforcement for the province. In such a way, the unit of measurement can be scaled up, by the finer grain of site-specific details retained for closer inspection. Units can further be sorted in ranks that indicate their geographic jurisdictional proximity, to indicate sub-regions of the coast that are functioning particularly well or poorly.

We interrogated the published ERA reports for linefish and WCRL (Nel et al. 2007; Petersen et al. 2010) to extract those entries that dealt with the category of governance under ability to achieve. Most of the entries that were flagged, dealt with governance at an institutional level. Those that touched on the issue of enforcement, did so in very general ways (e.g. 'stop poaching') that did little to indicate the kind of specificity needed to suggest concrete actions that would facilitate the achievement of formulated management objectives. Many issues that ultimately impact on the inspectors' ability to do their day-to-day job effectively, stem from confusing, opaque or inefficient enforcement protocols, policies or processes—both from fisheries resource management and the compliance section.

The ethnographic research also recorded a significant lack of cooperation between departments within the Fisheries Branch, and between department management and the compliance section, which in turn fuelled either distrust between units or departments, and created inefficient work plans. While members of resource working groups and organisers of stakeholder meetings have often lamented (as noted in ERAs and ERA reviews) that inspectors do not attend meetings where their input is needed or where they could gain important knowledge, the inspectors in turn often lamented to MN that they are not included in any policy or decision-making processes. This is clearly a miscommunication that could be easily rectified by simple measures such as designated attendees and by establishing formal feedback procedures on both correspondence and attendance. Attendance alone is not enough—it must be backed up with follow-through communication. An appropriate indicator might be a record of attendance coupled with a quantification of who and where the information was disseminated to (Table 1).

Such inefficiencies are often related to the many organisational divisions within the MCS chief directorate, such as that between the Fisheries Patrol Vessels (FPV) section, and the land-based inspectors. Those inspectors who are land-based, are not permitted to do sea-based patrols, despite the fact that many long-term inspectors still retain skipper skills from when such a division of jurisdictions did not exist. At the moment, land-based inspectors are required to call for FPV assistance when needed, but can only wait and watch from land. In Paternoster and St Helena Bay, for example, the inspectors may observe illegal fishing a short distance off-shore, but will need to radio for FPV support—which is based in Saldanha Bay and who need to mobilise before making the approximately 35–40 nautical mile ride up the coast. While resource users have the option of traversing the line between shore and sea, the inspectors are prevented from doing so and therefore are often barred from acting timeously. The was an oft-repeated criticism in all field sites.

Inspectors are wary of making even legitimate complaints to management, as they are convinced that such criticality may negatively influence their job, either in terms of prospects or yearly assessments. Importantly, inspectors also do not currently have the institutional support or information to effectively communicate management decisions to resource users. While the Department does host information sessions on new rights, policies and processes (usually referred to as 'roadshows'), these meetings are notorious for being cancelled at the last minute, or held too irregularly, or not well attended by either management or resource users (to varying degrees). This means that it is often the inspector present in the fishing site who becomes the focus of the resource users' questions and appeals (Ethnographic Anecdote #3). Often, the inspectors do not have the explanations that the resource users seek, and so the resource users are left with the sense that the rationales are confused or ambiguous, when that may

**Table 1** Hierarchy of specific objectives pertaining to the objective "1.1 DAFF: Fisheries Branch is successfully executing its mandate", as linked to the general objective "1 Good Governance" in Fig. 2

| Objective Level 3 (intermediate) | Objective Level 4 (intermediate) | Objective Level 5 (specific) |
|---|---|---|
| The right processes are being applied at all times in the DAFF: Fisheries Branch | Processes of communication with the public are fair, transparent, appropriate and timeous | Roadshow timetables are published well in advance and adhered to |
| | | All decisions are clearly explained and communicated in public fora |
| | | Investigations into allegations of corruption and/or mismanagement are conducted by an external auditor and the findings made public |
| Institutional knowledge held by current DAFF: Fisheries Branch staff enables full understanding and implementation of established professional standards | | DAFF: Fisheries Mgmt |
| | | Working Groups follow established professional procedures |
| | | The results of processes in DAFF:Management are relevant, accurate and timeous |
| | | Recommendations of DAFF Mgmt working groups are open to public scrutiny |
| | | The process through the chain of approval is transparent |
| | | Outcomes of fisheries management decision are communicated timeously and in full to the MCS Directorate |
| Decisions related to fisheries management are communicated "down the ranks" appropriately in the MCS Directorate | | Communication within Department is timeous and transparent |
| | | Communication to Stations is timeous, transparent and effective (i.e. no broken fax machines or dysfunctional internet) |
| | | All inspectors are confident that the management regulations they are asked to enforce have been arrived at after due procedure and are sound according to best professional practice |
| Communication between the DAFF: Fisheries Branch Directorates works well | 1. Regular meetings take place *between* the Management and MCS Directorates | 1.1 Schedule, agenda and minutes are available |
| | | 1.2 Meetings take place at least every 3 months |
| | 2a. Compliance inspectors are invited to meetings that discuss legislation, policy and permit conditions | 2.1 Memos and information are sent out in a format that is accessible to all staff, agendas are sent out to stations at least one week in advance; and receipt of all communication is acknowledged by a designated representative |
| | 2b. Relevant departments and units related to any issues discussed are informed about the issue in a transparent manner | 2.2. Compliance units can send representative to attend meeting, representative is tasked with feedback, and assigned transport and cleared of duties in order to be able to attend. |
| | | 2.3. Task teams formed to deal with issues are staffed appropriately |
| | | 2.4. Minutes of all meetings contain explicit reference to how contents affect the implementation of marine resource law enforcement |
| | 3. There are clearly defined agendas and protocols for feedback sessions to staff *within* the directorates | 3.1. All protocols are being adhered to |
| | | 3.2. Random questioning of attendees of feedback sessions is carried out intermittently to ascertain high quality of feedback |
| | 4. All affected by an issue discussed are invited to feedback sessions in the same, transparent manner | 4.1. Feedback sessions happen within 10 days of the original meetings |
| | | 4.2. Attendance registers are taken and minutes are taken |
| | | 4.3. Attendance registers are made available on mailing list to advertise who attended |
| | | 4.4. Designated representatives report-back the minutes to their groups |
| | | 4.5. Comments from groups are relayed back to the (inter-directorate) task team dealing with the particular issue |
| | | 4.6. Receipt of the feedback is acknowledged in writing and a timeline for response is provided |

**Table 2** Hierarchy of specific objectives pertaining to the objective "2.1 DAFF:Fisheries:MCS functions in a consistent and professional manner", as linked to the general objective "2. Good Enforcement" in Fig. 2

| Objective Level 3 | Objective Level 4 | Objective Level 5 (specific) |
|---|---|---|
| Staff turnover is low | 1. Remuneration is appropriate | 1.1. Staff receive permanent contracts with benefits |
| | | 1.2. Refund of cost incurrent in line of duty (e.g., cell phone calls) is full and timeous |
| | 2. Working conditions are good | 2.1. Headquarters staff agree that working conditions are good |
| | | 2.2. A combined score above an agreed threshold is obtained from working conditions at units and in the field, demonstrating that working conditions along the coast are good |
| | 3. Working hours are appropriate | 3.1. Working hours are appropriate to fishing activities, i.e., staffing is ensured after 16 h and during weekends |
| | | 3.2. Flextime is given during bad fishing weather |
| | 4. Bonus system is good, fair and transparent | 4.1. Inspectors agree that the bonus system is fair and transparent |
| | | 4.2. Inspectors agree that bonus system is an incentive to excel |
| No corruption | 1. Anti-corruption measures are put in place and are effective | 1.1. Suspensions are imposed immediately |
| | | 1.2. Lifestyle audits are carried out both regularly-at-random and when there is a suspicion |
| | | 1.3. Inspectors are given access to whistleblowing mechanisms that fully protect confidentiality |
| Headquarters ensures good communication and collaboration among units | 1. Meetings are held regularly to discuss overlapping issues and/or to impart knowledge and information | 1.1. Neighbouring units have a meeting and/or teleconference every 6 weeks |
| | 2. Credits are shared when successful operations occur | 2.1. "Stats" are shared between all involved |
| Compliance is incentivised | Fishers' desire to comply (beyond fear of getting caught) is acknowledged | Research is carried out into possible incentives for compliant behaviour |
| | | Such research is inclusive of the expertise of inspectors |
| Non-compliance is penalised appropriately | Penalties are appropriate to | Research is carried out how to weight penalties to be preventative and not merely punitive, and such research is inclusive of the opinion of inspectors |
| | The offence | |
| | The likelihood of re-offending | |
| | The ability of penalised to incur cost without it affecting their well-being, within reason | Inspectors provide their assessment of the appropriateness of penalties imposed by them according to the regulations |
| | The role of the person in the system/act of offence. "Runner vs. kingpin" | |

not be the case. That sense of confusion detracts from the authority of the legislation and therefore of the inspector, as they try to assert that authority in the course of doing their job. Many compliance issues ultimately stem from the same mismanagement and confusion noted above, largely thanks to issues the Interim Relief quotas and Fishing Rights Allocation Process 2013—which highlight the perceived lack of communication and transparent decision-making by the previous and current Minister (at the time of writing) and their top officials.

The establishment of new specialised units (such as an inshore WCRL task team as suggested in Nel et al. 2007) should only occur when management objectives cannot be met by the enskilment and training of already established units. In other words, *if* inspectors currently employed in existing structures were effectively trained and capacitated for the work, *if* specialised units and task teams needed to be established, *then* the staffing and expertise for such operations could effectively be drawn from existing personnel.

Currently, the success or failure of marine resource crime is judged, within the Compliance Section, by the number of arrests made (in comparison to previous years). This is not a nuanced measurement of success, and does not account for the possibility that lower arrest rates may mean more effective preventative law enforcement. More detail is required to make such assessments, such as: comparison of the number of dockets opened, the number of cases that make it to court, and the breakdown of how many of those cases are resolved, thrown out or indefinitely postponed.

**Table 3** Hierarchy of specific objectives pertaining to the objective "2.1 Units are capacitated to meet standards of good enforcement", as linked to the general objective "2. Good Enforcement" in Fig. 2

| Objective Level 3 (intermediate) | Objective Level 4 (intermediate) | Objective Level 5 (specific) |
|---|---|---|
| Inspectors are appropriately resourced | 1. Appropriate safety measures are in place | 1.1. Work shoes have been issued for dockside- and boat-inspections that are water- and slip-proof, and meet the SABS standards for protective footwear |
| | | 1.2. Bullet proof vests and means of defence are available to all inspectors and carried with on patrol and operations |
| | | 1.3. Appropriate vehicles are available at all stations |
| | | 1.4. Advanced driving courses relevant to their jurisdiction's terrain area available to all inspectors |
| | 2. Appropriate health measures are implemented | 2.1. Sun glasses with UV protection and polarisation are supplied to all inspectors |
| | | 2.2. Shade/shelter is available on site when waiting to inspect landings |
| | | 2.3. Hygiene facilities are available in places where they must often wait/work long hours |
| | | 2.4. A freezer suits in the right size is accessible when needed |
| | 3. Appropriate equipment is available at all stations | 3.1. Appropriate photographic cameras in good working order are available to all inspectors |
| | | 3.2. Office equipment (e.g., fax machines, computers with internet conditions and landlines) is available and in good working order |
| | | 3.3. Appropriate scales and length measuring equipment are available and in good working order |
| | | 3.4. Large lockable freezers are available and working |
| Inspectors are well-trained | Site/region/fishery appropriate fish identification skills are taught | Each training is |
| | EAF framework and philosophy is explained | - offered |
| | Acts are explained | - organised |
| | Regulations and their rationales are explained | - attended |
| | Conflict resolution and mediation skills are taught | Specific expertise (e.g. advanced conflict resolution/mediation) is accessible |
| | Site/region-specific language courses are provided | |
| | Specific writing skills are taught | |
| | Jurisprudence skills are taught (how to ensure conviction through appropriate responses and handling of evidence) | |
| | Photographic evidence recording skills are taught | |

In terms of conviction rates, there are a number of tried and tested strategies that would ensure a better rate of conviction, such as the Green Courts that were operational in the Overberg region from 2003 to 2005, with a conviction rate of 75% in the first 18 months (Ethnographic Anecdote #4). Inspectors and prosecutors who were involved with prosecuting cases in those courts praised them for the dedicated space in which to convict environmental crimes (as they did not have to compete with other prioritised cases such as violence or abuse) and because there was a relationship between prosecutor and inspector that ensured a stronger chain of evidence from observation, to arrest, to appearance in court. This was facilitated by continuous communication on the finer details of jurisprudence and the best way for the inspector to proceed to strengthen the state's case against the accused (the latter is noted in Table 3).

The issue of statistics is central to the functioning of the Compliance Section, and to the marine resource management in general. For inspectors, "having stats" (i.e. getting the credit for recognised enforcement successes) means that they could get performance bonuses after their yearly assessments. However, the system is competitive and the process often opaque (the inspectors are usually not present for the assessment and are often not told the reasoning behind decisions), so the performance assessments as currently instituted tends to pit individuals and units against each other. Departmental cohesion and collaboration suffer as a result.

**Table 4** Hierarchy of specific objectives pertaining to the objective "2.1 The presence of inspectors is accepted in their community", as linked to the general objective "2. Good Enforcement" in Fig. 2

| Objective Level 3 (intermediate) | Objective Level 4 (specific) |
|---|---|
| Each community accepts the presence of inspectors | 1. All inspectors rate their experience of living in the town/jurisdiction as pleasant (in relation to fishers) |
| | 2. Inspectors' children are not heckled/harassed/bullied for their parent's job |
| | 3. Inspectors' spouses or partners are not heckled/harassed/bullied for their spouse's job |
| | 4. Inspectors feel comfortable worshipping, socialising and shopping in the town/community |
| Inspectors do not need to fear violence or intimidation cause by being present or visible | 1. There is agreement among inspectors present that physical violence or an altercation is unlikely in the course of a routine day |
| | 2. There is agreement among inspectors present at the end of a routine working day that no physical obstruction to their duties was instigated or put in place by the community |
| | 3. No personal property of any inspector has been targeted as retribution for law enforcement activities of their unit |
| | 4. No inspector is verbally or physically threatened while on duty or off duty |
| | 5. All women inspectors feel secure approaching communities either on their own or in the company of another woman inspector |
| | 6. All women inspectors feel secure entering a place of duty (e.g., beach or harbour) on their own or in the company of another woman inspector |
| Inspectors do not feel the need to exert or project a threat of violence as a pre-emption or defence | There is agreement among all inspectors of a unit that projecting the threat of violence is not necessary in order to feel secure |
| | There is agreement among inspectors that projecting the threat of violence is counter-productive to good relations with the community |
| The community chooses to work with inspectors with respect to understanding new legislation | 1. There is an elected community liaison officer and an elected counter-representative from the community |
| | 2. When the need arises from either group, a joint meeting is called |
| | 3. This meeting has an agenda and terms of engagement are agreed |
| | Minutes are taken |
| | 4. The minutes are communicated to those not present but with a stake, including DAFF:Fisheries:MCM headquarters |
| | 5. Where necessary or appropriate, the inspectors undertakes to follow-up on questions to headquarters within an agreed timeframe |

Presented above is an illustrative example of a worked objective hierarchy as it refers to the unit or station (Fig. 3), where the management objective is "Units are capacitated to meet standards of good enforcement" (Table 3). In this anonymised example, the site in question is an urban station, in proximity to the provincial headquarters in Cape Town but operating in what can be referred to as a small town. The number of personnel permanently stationed here fluctuates, but there is always a Chief and at least four inspectors stationed here. It is a busy station that deals with commercial fishers, recreational fishing, small-scale fishers, illegal fishing, restaurant and processing facility inspections. As can be seen, before even looking at arrest statistics or personnel assessments, Fig. 3 shows clearly that this station does not meet the stated management objective. The evaluation in relation to the specific objective shows both achieved and completely unachieved standards providing detailed guidance for future improvement. As discussed by Jarre et al. (2008) and shown by McGregor (2015), synthesising the evaluation of the indicators requires stakeholder agreement not only about thresholds for specific indicators but also on the way that the synthesis is carried out.

## DISCUSSION

Figure 3 provides a clear list of what will need to be addressed to meet the objective detailed in Table 4 ("inspectors are resourced and trained"), concrete and constructive tasks for the Compliance Directorate to action. It is a simple exercise that can easily be repeated for the 19 other stations in the Western Cape. Furthermore, it is not specific to the Western Cape, or South Africa, and can be easily amended or added to, to reflect any other region's site-specific requirements for resource and training capacity.

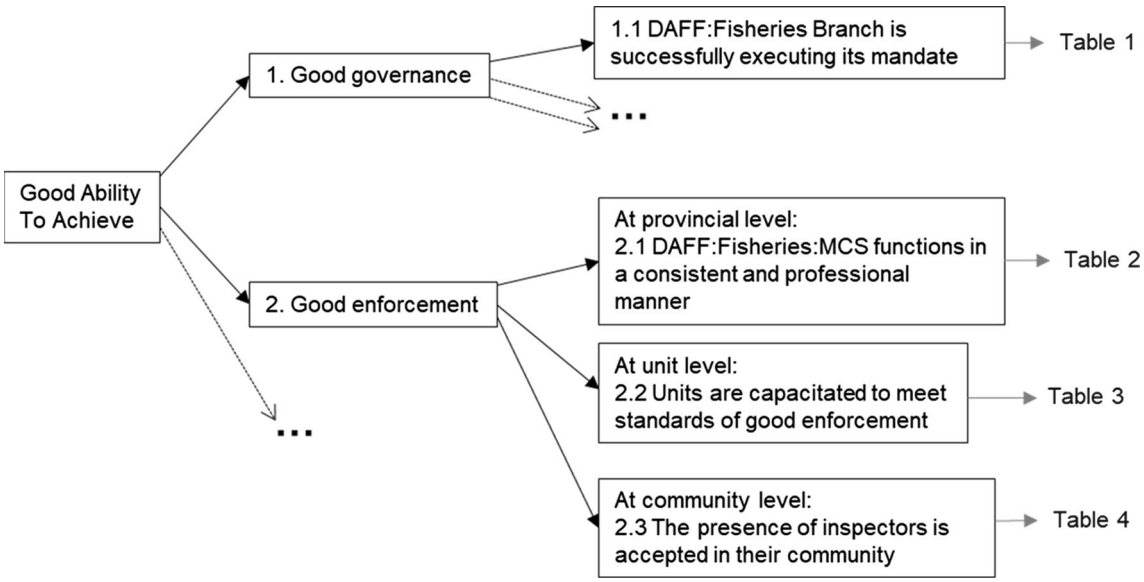


**Fig. 2** General objectives towards the goal of "good ability to achieve" in an ecosystems approach to fisheries in South Africa

Such detail also aligns better for comparison of fisheries-specific social and ecological well-being information, than the current broad strokes that governance tends to be painted with. For example, in the Petersen et al. (2010) report on the 2007 ERA processes, the note is made that there is inadequate training of fisheries compliance officers (inspectors) with no further elaboration, which obscures the many reasons that inspectors can be considered undertrained (though admittedly these are beyond the task undertaken by Petersen et al. (2010)). These other factors include: the range of training that the job-on-the-ground requires in contrast to what the Compliance Directorate management considers important (fish identification); how there are many other constraining factors beyond training; how an informal network of mentorship has come to stand in the stead of formal training; how a lack of equipment is often more disadvantageous than, or compounds, a lack of official training. These factors are covered in Table 3, in a series of level 4 objectives that speak to appropriate resources and training.

As can be seen in the value tree we have generated, based on ethnographic data, there are a slew of issues that should be considered before a judgement on the reasons for ineffective enforcement can be made. These issues were not tabled in the stakeholder meetings, or in subsequent reviews in connection with the ERA's, readily attributed to the lack of compliance officials in those meetings.

The research showed, clearly, that the disregard for inspectors' health and safety, and the neglect to sufficiently resource and train them, were important factors that led to ineffective marine resource law enforcement, in all nine field sites (Ethnographic Anecdotes #2 & #3).

As our results show, the issues that determine Ability to Achieve cannot be summed up by the Governance paradigm as formulated in the 2007 and 2010 ERA processes. We have formulated an assessment tool that can be used to more accurately gauge how a unit is fairing, and what the specific issues are that may be contributing to inefficiency or incompetency. We have done so by considering not only the health and safety, but also the training and resourcing of the inspectors themselves. Furthermore, we have included objectives and processes that are in line with the proactive nature of the Fishery Branch mandate, as opposed to a reactive paradigm that prioritises penalties. As the ethnographic research has shown, and the ethnographic anecdotes in this paper attempt to illustrate, the Compliance protocol is currently dominated by reaction, and so inspectors are essentially waiting for transgressions to occur before they are capacitated to act. This is not entirely due to the design of the law enforcement model in use, but also due to the lack of training, material resources, staffing or personal security that the inspectors experience. What this indicates is that there is currently not a sufficient feedback mechanism whereby the inspectors can offer their assessment of current management policy on their operations. Harm to the marine fisheries social–ecological system is arguably anthropogenic but not limited to the behaviour of resource users: many harmful events or effects are caused by inadequacies in governance (Hauck and Kroese 2006; Norton 2014).

Importantly, we show how this local-level assessment tool can be usefully scaled up to speak to the quality of province or nation-wide compliance enforcement. Furthermore, with the evidence presented, the case can be

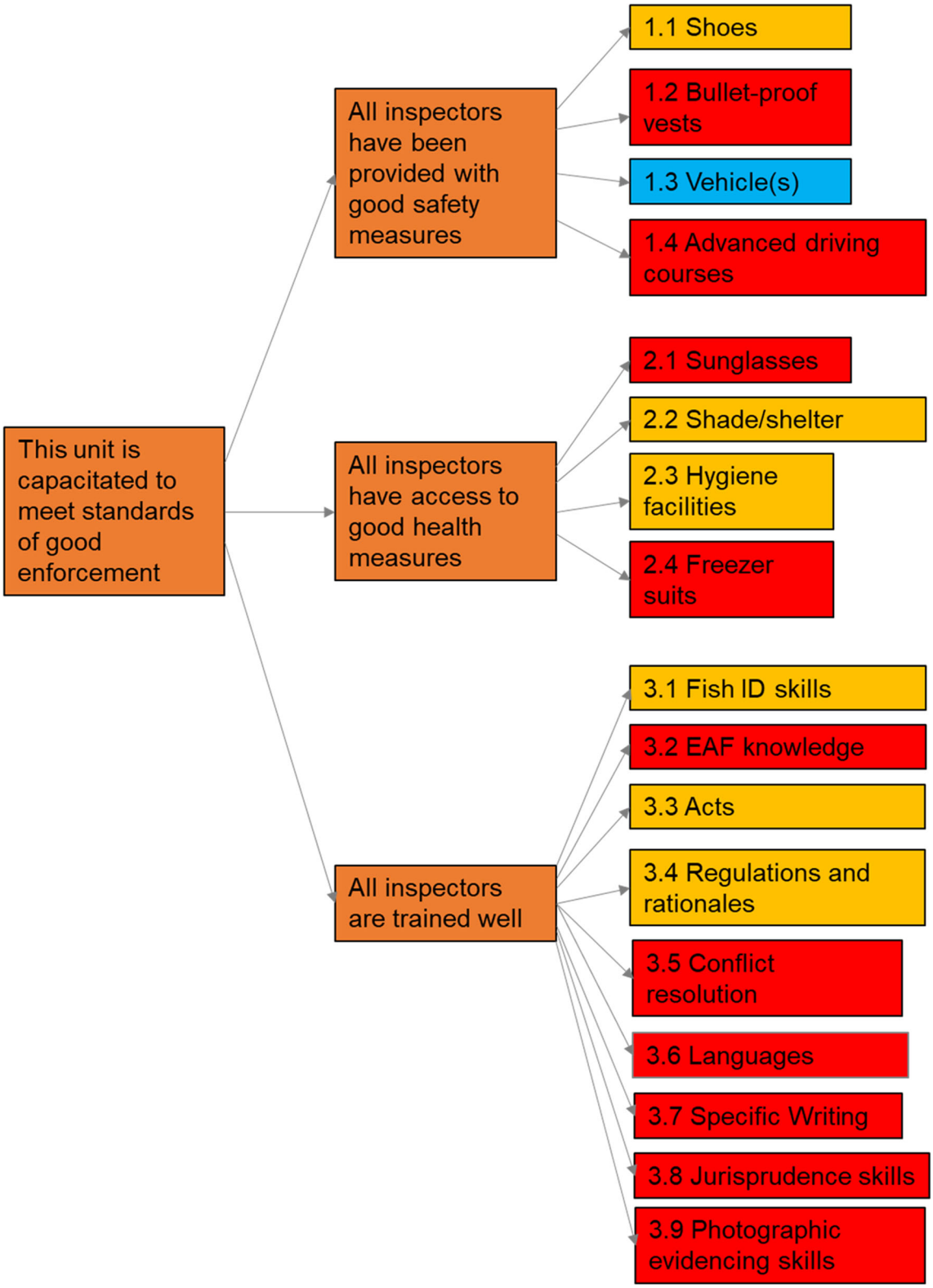


**Fig. 3** Illustrative example of a synthetic evaluation of the specific objectives pertaining to "2.2 units are capacitated to meet standards of good enforcement", as derived from ethnography and provided in Table 3. Blue: yes; red: no; yellow/orange: partial. See text for detail on unit

made that where incompetency is found or alleged, it may be possible to show that the inspector or unit was *made incompetent* by the context in which they find themselves, and that such incompetency is not necessarily inherent in the person themselves. In such a case, penalising a person or a unit without fixing those parts or processes of the system that prohibited good functioning, would be pointless.

It is important to note, however, that many of the issues identified as a problem of governance transcend the category of governance to impact on the inspectors' capabilities, and so the categories of enforcement and governance overlap.

While we acknowledge that corruption is indeed present in most (if not all) stations, and that it may in fact be rampant in some jurisdictions, for reasons of safety and project integrity, such data cannot be presented. While we do not attempt to solve the problem of corruption here, just as we cannot solve the problem of poaching, our argument is that at least some of the smaller-scale corruption, particularly the ad hoc corruption in the form of spot bribes, could be prevented by job security and safer working conditions (in the opinion of inspectors themselves and in our's). The ethnographic research clearly shows that most inspectors are living under conditions of economic strain, even scarcity. Not all but certainly some of the corruption occurs when inspectors are faced with the same ethical decision as under-pressure small-scale fishers: Do I adhere to the law, or do I pay school fees? One of the ways in which to make being corrupt less easy, we argue, is to have realistic evaluations done using tools for transparency, such as indicator-based evaluation systems—and not rely on possibly manipulated statistics or biased personnel assessments.

A resource that could potentially further aid inspectors in doing their jobs, is a database of offenders. Not all offenders are the imagined abalone or WCRL poachers. Other species are also poached, and it is not rare for recreational fishers to also push the boundaries of legality. In conversations with recreational fishers, the researcher was told on several occasions that when they over-catch, they will sell the fish to a local restaurant or guesthouse, as their freezer at home is full (which is in contravention of recreational permit conditions). The recreational sector rarely features in discussions of illegal fishing in South Africa, and offenders in this sector should be included in the database that we propose above. Such a database would not only, over time, provide greater detail to the problem of quantifying non-compliance, but ideally would serve as a means by which to block the issuing of future permits to transgressors.

In addition to more detailed arrest statistics, a clearer picture of the rate of poaching, in the various sectors, is needed. Current modelling suggests that the proportion of legal harvest to poached WCRL is 1:1.6 (Brandão et al. 2018). A combination of the estimated poaching rate, the current TAC/TAE's, scientific stock assessments and the amount of confiscated fauna does bring us closer to assessing the rate of poaching for each fishery, but it does not help us understand motivations or move toward solutions.

Global studies of resource user decision making and the motivations for non-compliant behaviour (Sutinen et al. 1990; Fulton et al. 2011; Hauck and Gezelius 2011; Catedrilla et al. 2012; Gore et al. 2013; Diogo et al. 2016; Young et al. 2016; Islam et al. 2017; Ballesteros and Rodrigues–Rodrigues 2018), have shown that there is an overwhelming number of issues that impact on the choices behind illegal fishing that are generated as externalities of several interlinked social problems. While an estimate of the rate of poaching, as discussed above is vital, so too is an estimate of the likelihood of poaching. We suggest a hierarchical set of objectives that track non-fisheries-related socio-economies that influence the decision to poach and the rate thereof, including but not limited to: unemployment rate; high-school drop-out rate; violent crime; families below the breadline; community involvement in management decisions; level of food insecurity; seasonality of un- or under-employment. Such criteria would be considered in the three dimensions of an EAF, rather than under the 'ability to achieve' paradigm—where the objective to decrease or stop poaching is currently positioned. This shows how the dimensions overlap, but also how governance or management objectives can be unrealistic if not related back to the human dimension (Paterson et al. 2010).

Another issue of some concern is the prevalence of situations in which inspectors are employed under contracts that do not constitute permanent employment. At the time of research, some of these contracted inspectors had had their contracts rolled over several times, meaning that while they were de facto permanently employed, they did not have access to the possible benefits of permanent status. This impacted them in a number of ways; for example, their ability to afford health insurance, or to access state employee education subsidies aimed at capacity building. An external, rigorous audit of employment contracts would help to ensure that the Compliance section of the Fisheries Branch is adhering to labour laws, and offering permanent employment, advancement and incentives to performing individuals and units.

When considering the structure of the objective hierarchies, it became apparent that many of the comments the ERA reports elicited from us touched on the way that blockages in the governance structure affected the ability of inspectors to do their jobs. Another point of contention

regarding how to structure the value tree was concerned about the level at which to put the ideal that "Inspectors *want* to do their jobs". The question of whether this is a management objective that relates to good governance, or a result that can be attributed a value to rate governance, is not trivial. We argue that this ideal should be an overarching management objective, the attainment of which can be assessed with the help of our objective hierarchy, in particular the section that deals with the health and safety of inspectors (Table 3). We offer the evaluation of safety and health-protecting measures as a rating of physical well-being, in *lieu* of an effective way to gauge job satisfaction in a meaningful way across such a diverse range of individuals. Here also is strong evidence for making a case for the use of fuzzy logic, for dealing with such potentially "partially right" (or wrong) statements. Using tools such as tailored Lichert scales, will allow for the inclusion of messy social interactions, which tend to be erased or oversimplified with "yes or no" indicators. As shown in Fig. 3, there are times when the answer is neither yes or no, and the evaluative framework must be able to incorporate that, for the sake of complexity and accuracy. Jarre et al. (2008) and McGregor (2015) show that this is not only possible in theory, but also that agreement among stakeholders can be reached on the best way to synthesise the detailed information.

The objective of Table 4, "The presence of inspectors is accepted in their community", is an example of on of the triage measures that we have taken in this paper, to include social messiness, rather than occlude it from the picture entirely. The ideal of management paradigms such as EAF or co-management as envisioned under the South African Small-Scale Fishers' Policy, would frame this objective differently: "The role of inspectors' is respected". As currently experienced, relations between many communities and law enforcement are so poor, that while the ideal may be one of *mutual* trust and respect, the reality is that the inspectors' very presence in that space is contested, before they even attempt to enact a role (see ethnographic anecdotes number 1 and 3 in particular).

We have here chosen to focus on the new Enforcement section, to ensure that Value Tree derived from this exercise was not only grounded in observed ethnographic phenomena and contained enough specificity to portray an individual station accurately, but also was based on a structure of categories (e.g. material resources, health and safety) that allows (i) it to be scaled up to a regional evaluation and (ii) for it to be applied to any fisheries context where law enforcement or governance implementation needs to be evaluated.

## CONCLUSION

The importance of human health and well-being is directly addressed by both South Africa's Bill of Rights and the Fisheries Branch mandate, as is the need to protect the marine resources and ecology. The actions of the Fisheries Branch are justified as preventing harm, and penalising by imposing it, respectively. While well-being or health may be their mandate, the indicator most often used to judge the success of compliance initiatives is statistics. The types of harmful effects felt in the fisheries complex cannot be fully accounted for in this manner. A focus on harm alone is reactive.

The Ecosystems Approach to Fisheries acknowledges that people form part of the network that can be described as a marine social–ecological system. However, research in South Africa's Western Cape Province has shown that it is not enough to include them as dormant categories, but need to consider them in terms of relationships: between inspectors, between units; between personnel and management; between resource users and the people policing them; between people and the ecologies they live in. This has proven so fruitful for the expanded understanding of fishing practices and behaviour, and for an integrated understanding of the ecologies, and also must be extended to the law enforcers.

For compliance functions and personnel to be mobilised in the pursuit of well-being of people, resources and systems, inspectors need to be acknowledged as people and not interchangeable functionaries. The evaluation of the efficiency of marine compliance is currently not sufficiently aware of these issues, and as such are not grounded in the day to day realities of marine resource management as carried out by people and not objectives.

This, then, is why we have designed and presented three objective hierarchies (value trees)—to not only offer a more grounded form of assessment for this vital dimension of fisheries management, but to also think through how far such a tool is able to take us, and to map possible pathways beyond that point. Certain core objectives cannot be measured by "yes or no" indicators alone, nor do they only apply to only one category (enforcement or governance). Where possible, we have suggested a set of indicators. We have also included several objectives that cannot be effectively measured by indicators, due to their messily interactive nature.

There are limits to this approach. First, the ethnographic data collection methods used in this particular case are time consuming and require a large amount of detail to be of use in constructing site-specific accounts of the site or process in question. However, we argue that while this may be a

logistical limitation, it is a requirement for social–ecological systems thinking and for models of adaptive or collaborative resource management. Wicked problems require hard work; trying to correct frameworks that are inaccurate is more laborious than putting in the work to be accurate from the beginning. Second, while the ethnography has here been adapted to fit into the larger framework currently employed in fisheries management in South Africa and elsewhere, the set of indicators we present is not intended to be prescriptive. It is not the specific objective hierarchies presented here that are being prescribed. Rather, it is the thinking behind the data—that social complexity and physical bodies need to be incorporated into a framework that allows for transparent and repeatable evaluations—that we are suggesting as an important move towards the effective implementation of social–ecological systems thinking.

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