

# The challenge and opportunity of behaviour change methods and frameworks to reduce demand for illegal wildlife

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Academic editor: *M. Grodzinska-Jurcak* | Received 3 December 2017 | Accepted 9 April 2018 | Published 25 April 2018

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<http://zoobank.org/43717C98-86B8-4AEE-90B0-45C7131346EB>

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**Citation:** Wallen KE, Daut EF (2018) The challenge and opportunity of behaviour change methods and frameworks to reduce demand for illegal wildlife. *Nature Conservation* 26: 55–75. <https://doi.org/10.3897/natureconservation.26.22725>

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## Abstract

Biodiversity conservation is contingent upon managing human behaviour and, at times, changing behaviour. This is particularly relevant to the illegal trade in wildlife and wildlife products, both flora and fauna. Driven by dynamics of consumer demand and illicit supply, mitigation of illegal trade requires a fuller appreciation of human behaviour and methods to change it. In various sectors, social influence, behavioural insights, social marketing and human-centred approaches trend towards mainstream practice and policy application. However, in the context of conservation and wildlife trafficking, these approaches and their usefulness are not well-articulated nor application widespread. Here, we provide a practical overview of relevant behaviour change methods and frameworks. We discuss their usefulness and potential application to mitigating the illegal wildlife trade, in general and consumer demand, in particular.

## Keywords

Consumers, human-centred design, nudges, social marketing, social norms, theory of change, wildlife trade

## Introduction

Conservation is contingent upon human behaviour and, at times, changing behaviour (Reddy et al. 2016, Schultz 2011, St. John et al. 2010). This is particularly relevant to and salient within the context of the illegal wildlife trade (IWT) (Biggs et al. 2017, Burgess 2016). Driven by various dynamics of consumer demand and illicit supply, the harvest and sale of flora and fauna overexploits and threatens various species (Oldfield 2003, Rosen and Smith 2010). As such, mitigating IWT necessitates that conservation professionals and policy-makers are aware of and acknowledge the cognitive, social and institutional elements that influence human behaviour and the methods and frameworks of behaviour change.

In various sectors, behaviour change methods and frameworks have become central to practice and policy, e.g. health, finance, transportation and public utilities (Organisation for Economic Co-operation and Development [OECD] 2017, World Bank 2015). In the context of conservation and IWT, their use is not well-documented nor their application mainstream; though some organisations have begun to focus on behaviour and emphasise strategic application of behaviour change methods and frameworks. For instance, TRAFFIC, a wildlife trade monitoring network of researchers and practitioners hosted by the World Wide Fund for Nature (WWF) and the International Union for the Conservation of Nature (IUCN), has developed and made publicly available a Wildlife Consumer Behaviour Change Toolkit (available at <http://www.changewildlifeconsumers.org>). Oxford University, in late 2016, started the Oxford Martin Programme on the Illegal Wildlife Trade, a collaborative initiative focusing on consumer demand and behaviour change aspects of IWT. In late 2017, WWF's Fuller Symposium focused exclusively on the science of behaviour change and effective methods that influence behaviour (available at <https://www.worldwildlife.org/pages/the-nature-of-change>). These and similar initiatives aim to provide essential resources, knowledge exchange and network-building that enable a community of practice to meet a common goal of reducing demand for illegal wildlife via social and behaviour change (Lertzman and Baragona 2016).

Our discussion of behaviour change and IWT mitigation, like others', focuses on the role of consumer demand, which is recognised by many, including governments and non-governmental organisations (NGOs), as a significant and inherent driver of IWT (Daut et al. 2015, Executive Order 2013, McHale and Hayes 2014, Traffic 2008, WWF 2012). In addition, researchers and practitioners suggest a consumer demand/behaviour focus for several reasons: (1) enforcement and regulatory strategies often fail to adequately account for underlying social drivers of illegal trade (Challender and MacMillan 2014), (2) demand for illegal wildlife is more appropriately viewed as being wealth driven, not poverty driven (Duffy 2010), (3) mitigation strategies often neglect consumer preferences and behaviour (Nijman 2010, Verissimo et al. 2012) and (4) regulations often focus on enforcement but neglect demand reduction and local community engagement (Roe 2015, Wellsmith 2011).

Here, we complement these initiatives and published works by providing a practical overview of behaviour change methods and frameworks. We also provide examples specific to IWT, highlighting successes and failures. Our overview of select methods and frameworks serves to highlight the challenges and considerations that should be taken into account when conservation professionals and policy-makers chose to apply and evaluate behaviour change. Furthermore, to lend additional practical and policy relevance, we introduce the concept of Theory of Change (ToC) as a process for conservation professionals and policy-makers to examine the position and suitability of behaviour change strategies alongside other efforts.

### **Basic considerations of context and scale for behaviour change**

Human behaviour is complex, relative and context-dependent. Reasonably specific and small-scale behaviour change involves navigating, coordinating and influencing multiple cognitive and social processes, stakeholder groups and environmental or institutional circumstances. Implementing household energy-saving measures, for example, can involve coordination amongst residents, utility providers, policy regulators and commercial companies. In the context of the wildlife trade, an illustrative example of coordinating multiple stakeholders to change behaviour is the plume feather trade of the early 1900s. At the time, overexploitation of migratory birds for decorative feathers caused dramatic population declines, particularly of egrets (Souder 2013). Mitigating impacts required coordinating the behaviour of wealthy consumers, retail merchants and policy-makers. The coordination of these stakeholders via social influence, stigmatisation, education, outreach and lobbying resulted in the development of the Weeks-McLean Law in 1913, which later transformed into the Migratory Bird Treaty Act of 1918 (Souder 2013).

As implied by these examples, the behaviour of any one stakeholder interacts with those of others. That is, individual behaviour is influenced by both internal and external factors. Whereas cognitive factors such as beliefs, values, attitudes and emotions directly or interactively influence behaviour, they also interact with institutional factors like informal social norms or cultural taboos and formal regulations like treaties or directives. As such, central to changing behaviour is to understand the context in which behaviour operates and manifests. Each setting poses different contextual factors that constrain or afford certain behaviour change strategies. These may include cultural practices, economic conditions, governance structures, geography or associations with other illicit trade activities like human trafficking and organised crime (Brashares et al. 2014, Gore 2011). For example, Parry et al. (2014) highlight the failure of comprehensive bans and punishments designed to mitigate demand for wildlife in Amazonia because enforcement is scarce and illegal behaviour deterrents few. They suggest a more context-specific approach in which locals are allowed to trade harvest-tolerant species, with increased protection and enforcement focused on more vulnerable species.

Alongside this example, a body of literature is developing that evinces the need for context-specific behaviour change approaches (Kahler et al. 2013, Steinmetz et al. 2014). While perhaps the idea of context-dependence is a truism, consideration of context is crucial to implementing effective on-the-ground behaviour change and consumer demand reduction (Brashares et al. 2014, Gifford and Nilsson 2014).

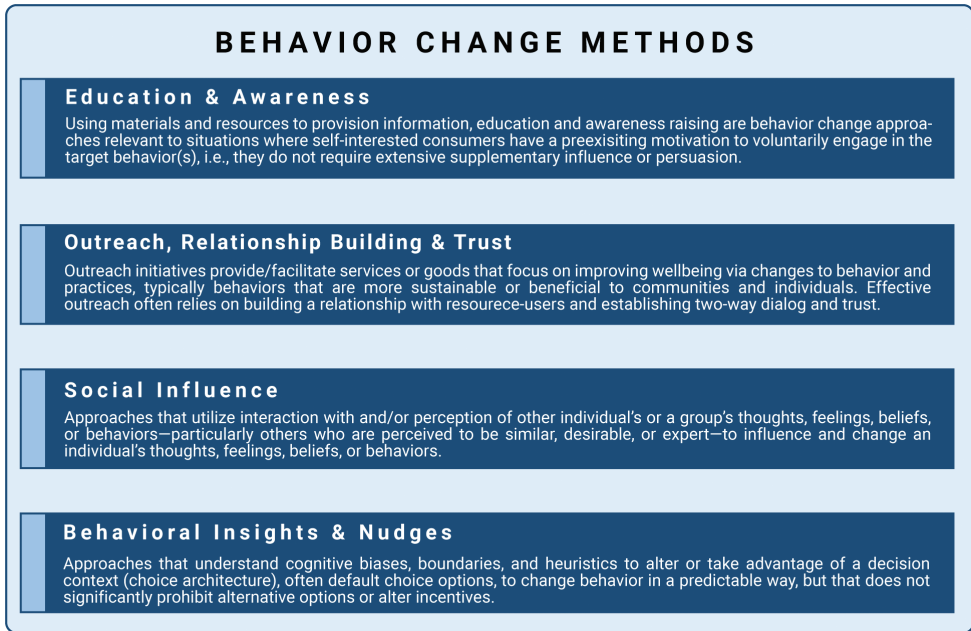
Scale is another element that behaviour change strategies must consider. Behavioural influences are multi-layered and can manifest and operate at various scales depending on the lens through which they are viewed, i.e. the individual, group or society (World Bank 2015). For example, behaviour can be viewed through the lens of a person making decisions via automatic judgements, without deliberation or deep thinking (based on habit, instinct or imitation). From another perspective, a person behaves more deliberately via active consideration of what others around them do or think, perhaps based on prevailing social norms and cultural values (Reddy et al. 2016). The illegal trade of wildlife is a system that operates at multiple spatial and temporal scales, from local–global and individual–societal, as species and products often traverse several scales from harvest to consumption (Gao and Clark 2014, Traffic 2008). Delineating the multiscale nature of IWT and associated behaviour is necessary to identify relevant behaviour, define context and choose appropriate behaviour change methods and frameworks.

## **Behaviour change methods: strategies and tools**

The relevance and suitability of the behaviour change approaches which are outlined vary in relation to the context and scale of the behaviour targeted for change. Behaviour change methods will also vary in terms of how passive (indirect) or active (direct) the mode of influence or persuasion is. For instance, the messages and graphics in campaign materials like signs, brochures or websites are passive modes of influence, which are often static and the likelihood of an individual interacting with them is uncertain. In contrast, a block leader approach is an direct, active mode of influence that uses face-to-face and interpersonal communications to increase the likelihood of an individual interacting with the mode of influence (Abrahamse and Steg 2013). Here, we summarise four behaviour change methods and provide a general overview of their application and, when applicable, application specific to IWT (Fig. 1a). For more thorough descriptions and discussions of these conceptual approaches to behaviour change, we recommend further reading of referenced materials.

## **Education and awareness**

Providing educational and awareness-raising materials and resources are intuitive and often default behaviour change strategies (Daut et al. 2015). These modes of behaviour change tend to focus on information-provisioning, often based on a “bank model”,



**Figure 1a.** Infographic overview of selected behavior change methods relevant to reducing consumer demand for illegal wildlife and wildlife products.

wherein it is assumed that individuals lack the necessary information and provisioning information will change behaviour, accordingly (Freire 1970). This type of behaviour model is sometimes referred to as an information- or knowledge-deficit model (Owens 2000). In the form of information-provisioning, the efficacy of education and raising awareness as a behaviour change method are greatest when individuals are motivated by a pre-existing self-interest to (voluntarily) engage in the desired behaviour (Rothschild 1999). That is, behaviour change is most likely to occur when individuals are provided with information that aligns with a pre-existing personal interest to engage in the target behaviour. For instance, Frantz and Mayer (2014) and Carmi et al. (2015) suggest pre-existing emotions and “connection to nature” are important mediators of the relationship between knowledge and behaviour in the context of environmental education. With the absence of emotions or other pre-existing factors or motives, the prospect of changing behaviour diminishes (Lo et al. 2012).

In the context of IWT, when a consumers’ interests and/or motivation align with those of the education and awareness-raising efforts, these can be effective behaviour change tools that provide the information for purchasing decisions. For example, consumers who purchase exotic pets, meats or souvenirs may be unaware they are purchasing illegal wildlife or wildlife products and merely require this type of information to refrain from purchasing (e.g. Moorhouse et al. 2017). This consumer segment is not actively attempting to purchase illegal wildlife and their consumption may be entirely unintentional or inadvertent. Other examples of targeted education campaigns by NGOs have

led to decreased demand for parrots in Saint Lucia (Jenks et al. 2010), rhino horn in Yemen (Vigne and Martin 2013) and shahtoosh in India (Misra 2003). Education can also be used proactively to subvert the creation of future consumers by educating younger generations (Daut et al. 2015). While not at the scale of current consumers, an inter-generational approach to behaviour change via education can be part of a larger behaviour change framework that strategically incorporates other methods outlined below.

### **Outreach, relationship building and trust**

Outreach activities, typically, consist of initiatives designed to provide or facilitate services or goods that improve wellbeing and/or initiate behaviour that are viewed as more sustainable or beneficial. For example, outreach to reduce consumer demand for illegal wildlife may take the form of direct and indirect public education or public advertisements (Daut et al. 2015). While the term outreach encompasses various types of initiatives or interventions, including education and raising awareness, we distinguish outreach as a behaviour change approach because it often emphasises relationship building and garnering trust amongst stakeholders to enact collaborative behaviour change (Stern 2017). For instance, trusting the mode (e.g. workshop, training programme) or medium (e.g. governmental management agency, NGO), by which information and/or resources are provided, is a significant predictor of behaviour (Stern 2008). Likewise, efforts to influence culturally-entrenched behaviour can be difficult to accomplish without building a two-way relationship and dialogue with the target stakeholder groups (Stern and Coleman 2015). For many local or regional-scale IWT or conservation initiatives, the efficacy of education programmes, training workshops or community events/meetings hinges on the relationship and trust between stakeholders and those seeking to influence their behaviour.

Outreach activities coupled with robust stakeholder relations can be an effective tool to influence behaviour and reduce consumption of endangered or illegally-traded wildlife (Cvetkovich and Winter 2003, Perez 2008, Steinmetz et al. 2014). For example, outreach with traditional medicine practitioners has resulted in reduced use and, consequently, demand for illegal wildlife used in medicinal products (Traffic 2015). In Thailand, Steinmetz et al. (2014) combined long-term (4–6 years) outreach activities with social-psychological principles, such as social norms and motivations, to successfully reduce illegal poaching. These examples, while relying on synergies between two or more behaviour change approaches, highlight that a strong, trusting relationship between stakeholders and organisations is often a prerequisite for effective behaviour change.

### **Social influences**

Social influence refers to the change in behaviour which one individual causes in another, intentionally or otherwise (Turner 1991). That is, the behaviour and expectations of

others (un)consciously influences behaviour. Particularly influential are those within an individual's social groups, such as family or friends, neighbours or community members and members of a meaningful social group (Cialdini and Trost 1998). Concepts like social norms, social comparison and social learning are representative of this phenomenon. For instance, interactions with others from a social group foster cognisance and adherence to informal rules that guide individual behaviour (social norms), allows for comparison of behaviour to that of others (social comparison) and provides an opportunity to learn behaviour from others (social learning). Social influence techniques and methods are common across many fields of study and practice, as well as being central to many behaviour change strategies (Wallen and Daut 2017). Below, we summarise three common methods.

Normative social information and feedback is a method that relies on perceptions of and responses to information about behaviour that is common and/or approved, i.e. normative behaviour. This method of behaviour change uses specific normative social information to convey what behaviour other group members do and/or approve or expect. Following that information, a person is provided information about their personal behaviour in relation to others' behaviour and/or approval, which acts as a feedback mechanism (Schultz et al. 2018). This facilitates reflection and assessment of one's behaviour in direct relation to the prevailing social norm(s) of the focal group. With such information and feedback, an individual is assumed to align their personal behaviour with that of the groups in order to avoid perceived or actual social punishments (ostracism, shame) or to perceive or receive actual social rewards (praise, respect).

Public commitments, written or verbal, are used to bind an individual or entity to a specific opinion, goal or behaviour (Kiesler 1971). Commitment-making techniques can be effective at influencing short- and long-term behaviour change when they use monitoring and enforcement mechanisms to reinforce the agreed upon behaviour (Lokhorst et al. 2013). Public commitments, in the form of a written or spoken statements, are an example of this. They oblige an individual to align their behaviour with their commitment and, subsequently, be consistent in their behaviour with the knowledge that others are able to monitor their behaviour in relation to their public commitment (Cialdini 2001).

Block leaders are influential members of a social network that are used as agents for social influence and change. By capitalising on existing social networks and key members within the network, this method increases the likelihood that information about (un)desired behaviour reaches target individuals or groups. At the local scale, a block leader method is an effective influence approach given the inherent face-to-face interaction (Abrahamse and Steg 2013). For additional discussion and review of these and other methods, see Abrahamse and Steg (2013), Abrahamse et al. (2005), and Osbaldiston and Schott (2012).

With respect to IWT, emphasis on local-scale community engagement and behaviour change represents an opportunity to more widely incorporate social influence methods (Biggs et al. 2017, Cooney et al. 2017, Roe 2015). In general, past IWT projects that used these social influence methods have been positive to mixed. For example,

public commitments by celebrities, regional leaders and local community members are used extensively by organisations, such as WildAid (<http://www.wildaid.org/>) and Education for Nature Vietnam (<http://www.envietnam.org/>). However, the efficacy of their social influence approaches on consumer behaviour is not well-understood (Duthie et al. 2017). Public commitments by governments and businesses provide more tangible examples of behaviour change, albeit by institutions that facilitate consumer behaviour rather than individuals (Hall 2013; International Fund for Animal Welfare 2014). With regards to block leader approaches, Rare's longstanding Pride campaign is an example of a programme that uses influential members of local social networks to promote and persuade others to engage in desired behaviour or refrain from undesired behaviour (Jenks et al. 2010). Given the limited application of social influence approaches to reduce consumer demand for illegal wildlife, we provide hypothetical examples of their use in Table 1 to demonstrate potential on-the-ground applications.

## Behavioural insights and nudges

Behavioural insights and the term nudge originate from various cognitive science disciplines that have identified specific cognitive biases, boundaries, heuristics and habits that influence behaviour and increase the predictability of behaviour (Kamenica 2012, Thaler and Sunstein 2008). This behaviour change method builds on the assumption that the behavioural choices available to an individual within any setting are limited. That limitation of choice is referred to as the decision context (or choice architecture). A nudge is an alteration to the decision context that changes behaviour in a predictable way without significantly prohibiting alternative options or altering incentives (Thaler and Sunstein 2008). For example, in many settings, a default choice (or default option) steers individuals towards a reasonably predictable behaviour. Common examples of defaults are *not* being automatically: enrolled in a retirement fund (e.g., 401K), registered to vote or listed as an organ donor. Vice versa, these include automatically: enrolling to receive email marketing, contributing a low level to your retirement fund or donating a portion of a tax return to charity. Nudges, generally (but not exclusively), are interventions that attempt to change behaviour by replacing or making the default choice more or less easy, intuitive, attractive, social and/or timely. That is, changing the default choice changes behaviour, e.g. an individual *is* automatically enrolled in a retirement fund, registered to vote or contributes the maximum level to a retirement fund each pay period. Other types of nudges incorporate aspects of priming, cognitive biases, perceptual cues and social influence and can be combined with other behaviour change approaches (OECD 2017). For instance, as a perceptual cue, reducing the size of a plate or bowl can reduce the amount of food consumed as the perception of portion size is relative to the dish on which food is served.

The term behavioural insights is commonly used to denote the application and integration of nudges into public policy design and evaluation. Relative to other sectors, nudges are uncommon in conservation and wildlife trade policy. Though not explicitly



**Table 1.** Three hypothetical IWT scenarios<sup>a</sup> and suggested social influence methods to reduce consumer demand for illegal wildlife and wildlife products (adapted from Wallen and Daur 2017).

Illegal wildlife product	Desired behavior change	Target audience	Social influence approach
Bushmeat of protected-species (i.e., that may be served at restaurants in urban areas)	Consumers select bushmeat legally harvested with commercial quotas	Restaurant customers, e.g., tourists, businesspersons, or military personnel <sup>b</sup>	<p><i>Normative social information:</i> place visible signs and other messages at relevant locations to expose consumers to information that (1) bushmeat consumption is socially disapproved and (2) a majority does not consume bushmeat.</p> <p><i>Public commitment:</i> encourage senior and/or influential military and business personnel to pledge they will not consume illegal bushmeat and denounce illegal consumption.</p>
Protected songbird species Illegally-harvested as pets or for singing competitions in Indonesia or Amazonia	Select legally-harvested or captive-bred songbirds	Songbird club members and hobbyists	<p><i>Block leader:</i> Recruit club founders/ leaders to use and promote the use of only captive-bred or legally-capture species for singing competitions; block leaders talk to other clubs to persuade them.</p> <p><i>Normative social feedback:</i> Create clubs or singing competitions with prestigious participants and prizes that only allow certified captive-bred birds; do not allow clubs and individuals using illegally-harvested birds to participate.</p>
Asian and African pangolin <sup>c</sup> scales as traditional medicine in Viet Nam <sup>d,e</sup>	Select alternative modern medicine or other traditional medicine from legally-traded species	Affluent, urban consumers	<p><i>Public commitment:</i> obtain public pledges from traditional medicine practitioners, physicians, or celebrities stating they will not purchase or consume pangolin products.</p>

<sup>a</sup>Each scenario should start with a baseline evaluation to better understand the context and scale of consumption to determine the most appropriate method.

<sup>b</sup>Military personnel, businesspersons, and tourists are significant consumers of novelty bushmeat.

<sup>c</sup>Trade and consumption of Asian pangolins is illegal in Viet Nam.

<sup>d</sup>A first step would be identifying areas where products are sold, the merchants, and the consumers.

<sup>e</sup>Over the past 15 years the demand for pangolin has increased as the traditional medicinal market has reemerged.

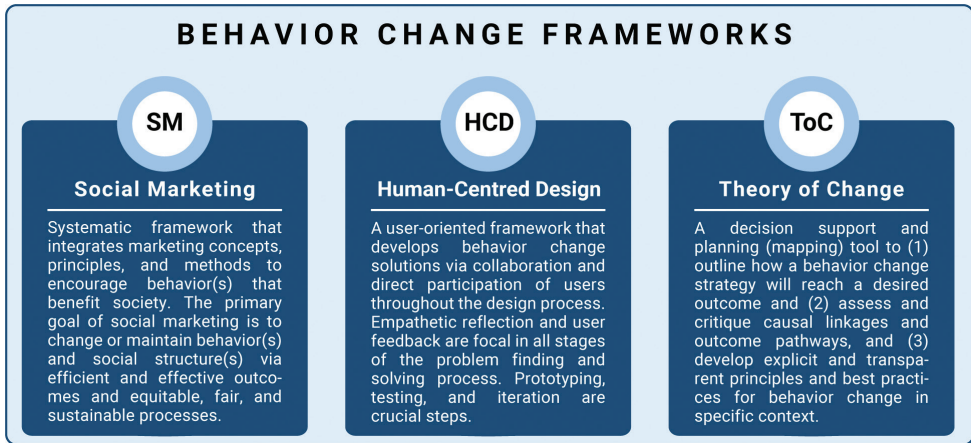
designed as a nudge, Indonesia's fatwa policy against all hunting of and trade in endangered species incorporates aspects of social norms and taboos to create a new default that nudges individuals towards more socially desirable and religiously approved behaviour (Meissner 2015). Nudges can be used to redirect behaviour towards a familiar or existing alternative without having to create a new behaviour. For example, as humans tend to be loss averse, a behavioural nudge could frame an existing IWT behaviour as having short- and long-term economic, social, or health costs and risks. Loss-aversion nudges can also be designed to eliminate a default choice and direct individuals to consider losses incumbent in a non-preferred alternative (Keller et al. 2011).

Nudges relevant to IWT and consumer demand may involve the development of text message programmes or smart-phone applications that provide information about known IWT retailers and alert consumers to alternative choices. The principles of behavioural insights can also be used to nudge institutions and governments. For instance, the combination of local behaviour change working synergistically over time (e.g. education, outreach, public commitments) can nudge governments by changing their default option. That is, prior to local-level efforts towards consumer demand reduction, a government's default may be lax IWT policies, negligible monitoring and enforcement and limited motivation to improve policy. With a constituency of stakeholders shifting their behaviour and support for demand reduction policies, a government's default option can be nudged from the bottom-up. Hong Kong's domestic ban on shark fin soup and legislation introduced to ban the ivory trade after widespread advocacy from NGOs, influential celebrity endorsements and social marketing campaigns are examples of this type of indirect, bottom-up nudge (Environment Bureau 2013).

### **Behaviour change frameworks: implementation and evaluation**

Understanding the context and scale of behaviour to identify an appropriate behaviour change method(s) is followed by implementation and evaluation, which requires the use of adaptive, flexible and iterative multi-stage frameworks (World Bank 2015). Many behaviour change frameworks parallel adaptive or learning-based management, which are known as effective and robust management frameworks (Williams and Brown 2012). Importantly, these types of frameworks allow for systematic pilot testing, implementation and evaluation that is coupled with iteration, reflection and learning (e.g. McKenzie-Mohr 2011, McKenzie-Mohr and Schultz 2014, Schwartz et al. 2017). Recent work outlining the diversity of products (flora, fauna), actors (motivations, values), networks (small/large-scale, distribution), scales (local, national, international) and contexts (culture, geography) that define an IWT system serve as a pivot to look more closely at such frameworks (e.g. Phelps et al. 2016).

Evaluation is an essential element of any behaviour change framework or strategy (Ferraro and Pattanayak 2006, Olmedo et al. 2017). For example, marketers use a pre-test, concept test or copy test process to evaluate if elements of a campaign elicit the



**Figure 1b.** Infographic overview of selected behavior change frameworks relevant to reducing consumer demand for illegal wildlife and wildlife products.

desired response(s) (Kotler and Armstrong 2017). In the context of IWT, recent studies highlight the benefits of and insights gained when evaluation is made as an explicit and crucial step for the behaviour change process (Duthie et al. 2017, Olmedo et al. 2017). Below, we outline frameworks that enable the development, implementation and evaluation of behaviour change (Fig. 1b).

## Social marketing

Social marketing is a systematic, staged-planning framework that applies marketing principles to *sell* social good and solve a social problem by changing and maintaining beneficial behaviour (Andreasen 1995). Social marketers plan, design, implement, evaluate and adapt programmes by viewing an issue from the perspective of a specific and targeted audience (i.e. a “know your audience” principle). A social marketing campaign, generally, has three overarching objectives: (1) provision of information or create awareness to ensure a target audience understands basic concepts and ideas and their relevance to them, (2) make a desired behaviour easier by reducing or removing barriers and (3) develop and manage relationships with a target audience (Wright et al. 2015). These objectives are achieved using a stepwise, iterative process. Typically, this process consists of six steps or stages: (1) plan, (2) scope, (3) develop, (4) implement, (5) evaluate and (6) follow-up (Burgess 2016, Hopwood and Merritt 2011, Jenks et al. 2010). See Table 2 for more details of each step.

The flexibility and scope of a social marketing framework has led to context-specific variants. We outline two relevant to IWT: community-based social marketing (CBSM) and conservation marketing (ConsMark). CBSM represents a social marketing approach that stems from the pro-environmental and sustainability fields

**Table 2.** General outline and description of social marketing stages (step) and process.

<b>Plan</b>	An initial planning stage can help determine if social marketing is the appropriate framework for the scale and context of the target behavior change. Questions to consider are: what issue or challenge is being addressed, what resources are available to draw on, what associated policies (formal and informal) exist, what are potential risks or consequences of changing the behavior, what is the timescale partners have to work with, and can an evaluation strategy be created.
<b>Scope</b>	During the scoping stage, the behavior change method(s) are selected. Questions to consider during this stage are: who is the target audience and behavior, what are their motivations and barrier to desired behavior(s), what has been done previously, and what factors will affect the issue and behaviors based on the selected method(s). This stage can also be used to facilitate collaboration with stakeholders to co-identify important variables and co-develop methodology.
<b>Develop</b>	After planning and scoping to identify the behavior, audience, and method, the intervention requires operationalization and proof-of-concept via pretesting (pilot testing) with a subset of audience. During this step, set goals and identify specific, measurable, achievable, realistic, and time-bound objectives, and evaluate those based on pretest results. The pretest and goal setting can help maintain engagement and relations with the audience and external partners. Pretest results will determine needed adjustments.
<b>Implement</b>	The behavior change strategy is implemented at full scale. Though each campaign will differ, important tasks during this stage are monitoring, gathering feedback, being prepared to respond to problems, and publicizing benefits and ease of behaviors to garner support and engagement.
<b>Evaluate</b>	This stage is a formal review of the interventions objectives. Evaluation may take the form of qualitative and/or quantitative assessment. A desired outcome of this stage is a report with recommendations for improvement. Importantly, as the effects of a behavior change intervention may develop and emerge over time, either immediate and gradual, evaluation should be planned for multiple time periods post-intervention (e.g., 1-month, 3-month, 6-month, 1-year, 2-year, etc.).
<b>Follow-up</b>	Evaluation results are presented to stakeholders and a collective plan is created to move forward. At this stage, it is important to recognize and acknowledge positives and negatives as both assist in determining if modification to the intervention is needed or if the chosen methods were appropriate based on feedback from stakeholders. This stage represents the main recourse for feedback, iteration, and adaptation.

(McKenzie-Mohr 2011). The CBSM framework shares several similarities with social marketing. This includes the stepwise process to implement behaviour change: (1) identify a specific behaviour or set of behavioural actions related to the desired outcome, (2) uncover barriers to and benefits of types of behaviour, (3) develop strategies and/or design a programme to overcome those barriers and promote benefits, (4) pilot the selected strategy or programme and (5) broadly implement and evaluate the strategy or programme. As with its parent framework, CBSM emphasises preliminary identification of behaviour to target, removal of behavioural barriers and an iterative process of implementation, monitoring and evaluation. With its explicit focus on community- and local-scale issues, the principles of CBSM facilitate a scalable and context-specific behaviour change framework, which is a growing priority for IWT interventions to reduce consumer demand (Roe 2015).

Conservation marketing is a related framework that has developed in the conservation field (Wright et al. 2015). The ConsMark framework is defined as the ethical

application of marketing strategies with the objective of advancing conservation goals (Veríssimo and McKinley 2016). Apart from social marketing principles, the ConsMark framework also draws on aspects of branding, social media and conservation-specific concepts to guide and promote behaviour (Smith et al. 2010). Such marketing campaigns have been successful at encouraging sustainable seafood consumption and orca conservation (Wright et al. 2015). Social marketing principles have also been applied to conserve golden snub-nosed monkeys (DeWan et al. 2013), tigers (Saypanya et al. 2013) and to reduce wild meat consumption (Chaves et al. 2017). Importantly, ConsMark researchers and practitioners are beginning to emphasise and promote the crucial step of evaluation (Jenks et al. 2010, Veríssimo et al. 2017). For example, Duthie et al. (2017) evaluated the efficacy of celebrity endorsements designed to raise awareness and mitigate illegal poaching of wildlife. Results of this study were mixed, which suggest celebrity endorsements should be used with caution and in conjunction with standard marketing pre-test and post-test procedures.

## **Human-centred design**

The general principles of human-centred design (HCD) are derived from participatory action research (Reason and Bradbury 2008). The framework endeavours to develop, refine and implement a context-specific and locally-suited behaviour change strategy by working directly and collaboratively with the individuals and communities affected, i.e. those who will be using the strategy to solve the issue (IDEO 2015). An HCD framework, generally, uses a stepwise methodology consisting of (1) defining, (2) diagnosing, (3) designing, (4) testing and (5) scaling. See Table 3 for more details. Within the social sector, organisations like ideas42 (<http://www.ideas42.org>) and IDEO (<https://www.ideo.org/>) use a HCD framework to develop and implement user-orientated solutions to social issues such as water conservation, poverty alleviation, smallholder farming and urban sustainability (Tantia 2017).

While HCD is not widespread within conservation, it has similarities to community-based conservation but differs with its explicit focus on behaviour, viewing issues through a behavioural lens. In the conservation sector, it has been used, for example, to design frameworks that increase participation in conservation incentive programmes, engender local stewardship of resources and sustain long-term efficiency of programmes (e.g. Sorice and Donlan 2015). In the environmental and conservation fields, HCD has the potential to be an effective tool that can address iniquitous problems, which are epitomised by issues in illegal wildlife trade.

Empathy is a central tenet of HCD. This shifts researchers' and practitioners' focus from what to conserve and how to conserve it, to what fundamental stakeholder needs are met by a behaviour and how those needs can be met in alternative ways. That is, HCD recognises that the objectives of conservation may not align with the needs, motivations and values of stakeholders. For example, mitigating the illegal trade of songbirds in Brazil and Indonesia may require designing behaviour change intervention that do

**Table 3.** General outline and description of a human-centered design program to develop and implement strategies in collaboration with individuals and communities.

<b>Define</b>	Defining an issue within the HCD framework ensures desired outcomes are made explicit (i.e., changing behavior) but also ensures that no a priori assumptions for causes or solutions are implied. That is, the problem is defined only in terms of the behavior(s) targeted for change.
<b>Diagnose</b>	The diagnosis stage generates hypotheses for how and why a behavior(s) occurs. That is, using a behavioral lens that draws on insights from the social and behavioral science literature, collaborators identify potential behavioral constraints and affordances. This stage focuses on gathering information about context and scale. After gathering information and generating hypotheses, qualitative research that focuses on how behaviors occur (rather than why) is conducted via participant observations, semi-structured or unstructured interviews, and focus groups.
<b>Design</b>	A successful diagnosis stage will generate and prioritize possible behavioral constraints and affordances, enabling the design of potential solutions to change and maintain the desired behavior(s).
<b>Test</b>	At this stage, the proposed behavioral intervention(s) is implemented, tested, and evaluated. However, if a proposed intervention is complex, pretesting or prototyping is used (similar to social marketing pilot testing).
<b>Scale</b>	Scaling involves applying the designed and tested intervention to different spatial and/or temporal scale, i.e., taking from the local to regional or national level. For some interventions, scaling may involve process optimization and incorporating technology. In this sense, scaling could, for example, first involve lowering the cost of intervention development and delivery without compromising quality and then identifying more efficient communication tools, e.g., switching from an passive mode of communication to active mode. However, as behavioral solutions are dependent on the mode and medium of delivery, scaling must be done with behavioral principles in mind. For example, some interventions rely on building relationships and trust with local communities such that scaling up can be difficult. In these cases, it may be more effective to re-implement the HCD process at other local scales.

not necessary align with conservation goals. That is, stopping the trade of songbird species may be incongruent with local needs and require that consumption is shifted away from illegal to legally harvested species. Empathising with the needs and values of stakeholders facilitates the development of interventions that directly respond to them at the scale and context in which they make choices. This perspective also allows for stakeholders to learn and become active leaders in the continued implementation and redesign of approaches, without continuous external support (Gelcich and Donlan 2015).

### **Theory of change: tailoring and targeting approaches and frameworks**

The implementation frameworks presented above can incorporate one or several of the behaviour change methods in the form of cognitive, structural, environmental or technological interventions (Heberlein 2012). An obvious caveat to these behaviour change frameworks and methods is that they may be only part of a larger IWT consumer demand reduction campaign. The frameworks, which we present, are a means of identifying and implementing one or more of the methods. IWT and demand reduction are, however, complicated issues, which likely require mixing approaches, coupling those with regulations and understanding the resulting interactions (Challender

et al. 2015). Therefore, it is important that professionals and policy-makers ask how behaviour change fits with other conservation efforts and which are appropriate by developing a theory of change (ToC) (Biggs et al. 2017, Oxford Martin School 2016).

A ToC is a decision support tool that outlines expectation of what and how actions (activities) will occur to reach a desired outcome, including causal linkages and the sequence of actions. Importantly, it also makes explicit the assumptions that underlie each step of that sequence. Education approaches, for example, assume individuals are self-interested and motivated to voluntarily engage in the desired behaviour. A theory of change would explicitly outline this assumption and develop steps accordingly: the first being to measure individuals' motivations, then implement the education activity and, finally, evaluate the effect of education on the desired behaviour. A ToC may also identify gaps, such as the need for more qualitative approaches to better understand a specific context or provide in-depth baseline information on the behavioural process or scale of behavioural influences.

A major benefit of developing a ToC is that it provides a conceptual map of what each action or step does, its impact and how it leads to behaviour change; providing a clear description of how change occurs or why it did not occur. A ToC further enables stakeholders to develop explicit and transparent principles and best practices, moving them towards theory- and practice-based approaches that navigate the nuances and challenges of IWT mitigation and consumer demand reduction (Phelps et al. 2016). Biggs et al. (2017), provide one of the more recent and detailed examples of a ToC specific to IWT. Similarly, but not exclusive to IWT, Jenks et al. (2010) outline a ToC for Rare's Pride programme, which facilitates behaviour change in various conservation and natural resource contexts.

Importantly, the development of a ToC serves as a convergence for professionals, policy-makers and community members involved in IWT mitigation and demand reduction to more fully and explicitly elaborate on the tools and methods needed to attain desired reduction and change. That is, a ToC is not exclusively a social science tool to outline and map social scientific elements (though it does endeavour to bring those to the forefront); it enables various and diverse stakeholders to mutually understand how and why a system functions and change develops. A ToC can also serve as a communication tool for the various sectors, groups and individuals embedded within an IWT system to collaborate and develop a holistic understanding of how change happens, can be implemented and is sustained given a diversity of regulatory, economic, political, socio-cultural, technological and environmental factors in operation. In this sense, a ToC is an important tool to connect various methods and frameworks of behaviour change (Fig. 1b).

## **Conclusion**

Human behaviour, while responsible for illegal wildlife demand and consumption, also represents the means by which strategies to address IWT will more readily succeed. Changing behaviour often requires removing barriers to more desirable or equi-

table behaviour. Barriers may exist at the scale of the individual, e.g. ignorance that a purchase is illegal or that there is a legal alternative, which may merely require education or better information. More complex barriers are often embedded within socio-cultural or political contexts, requiring more dedicated relationship building or social influences that complement regulatory policies. Reducing consumer demand for illegal wildlife requires identifying and specifying behaviour that needs changing, identify those who engage in this behaviour and why and what is(are) the most appropriate means to remove barriers and influence more desirable or equitable behaviour. This necessitates that professional and policy-makers are aware of various approaches to and understand the practicality of behaviour change methods and frameworks applicable to IWT issues. It also requires that there is a social and behaviour change community of trained researchers and practitioners who are aware of useful methods and have access to tested knowledge. As an overview of behaviour change methods and frameworks, this article endeavours to benefit IWT professionals and policy-makers, as well as the broader social and behaviour change community.

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