Narratives of invasion and intimacy: Transborder relations with tamarisk in the Chihuahuan Desert

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Abstract

Tamarix spp., also known as salt cedar or tamarisk, has garnered a reputation in the United States as an invasive plant, with widespread policy and research advocating for its eradication in the Chihuahuan Desert region that spans the United States and the Mexico border. Yet, south of the border in Mexico, tamarisk is often integrated into daily life on more friendly terms. This study applies a political ecology lens to government and conservation publications and news articles on tamarisk between 1995 and 2020 to investigate media and governmental narratives in the Southwestern US and Northern Mexico as a contiguous region. Our research asks: In the last 25 years, how has the movement, management and biocontrol of tamarisk plants interacted with the broader discourses of invasion in the US-Mexico borderlands? We find that government and news media publications from the US side of the border are more likely to demonstrate combative and hierarchical narratives that frame human-tamarisk relationships using militaristic language, while narratives of tamarisk in Mexico—particularly as expressed in news media—are more diverse, and include articulations of a quotidian intimacy and relationality between people and tamarisk. The article argues that differences in discourses between publications from the US and publications from Mexico reflect a hegemonic relationship between the two countries that is also characterized by counterhegemonic practices. This intervention suggests new paths forward in thinking about introduced species through a lens of human-plant relations that deepens existing political-economic understandings.

Key words: Invasive species, discourse analysis, US-Mexico border, relationship, militarism, Tamarix

Résumé

Tamarix spp., également connu sous le nom de cèdre salé ou tamaris, s'est forgé une réputation aux États-Unis en tant que plante envahissante, avec une politique et des recherches généralisées préconisant son éradication dans la région du désert de Chihuahua qui s'étend à la frontière entre les États-Unis et le Mexique. Pourtant, au sud de la frontière, au Mexique, le tamaris est souvent intégré dans la vie quotidienne de manière plus conviviale. Cette étude applique une perspective « political ecology » aux publications gouvernementales sur la conversation et aux articles de presse qui traitent du tamaris entre 1995 et 2020 afin d'examiner les discours médiatiques et gouvernementaux sur le tamaris dans le sud-ouest des États-Unis et le nord du Mexique en tant que région contiguë. Notre recherche pose la question suivante : au cours des 25 dernières années, comment le mouvement, la gestion et la lutte biologique contre les tamaris ont-ils interagi avec les discours plus larges sur l'invasion dans les zones frontalières entre les États-Unis et le Mexique ? Nous constatons que les publications gouvernementales et médiatiques du côté américain de la frontière sont plus susceptibles de présenter des discours combatifs et hiérarchiques qui cadrent les relations entre les humains et le tamaris à l'aide d'un langage militariste, tandis que les discours sur le tamaris au Mexique, en particulier ceux exprimés dans les actualités, sont plus diversifiés et incluent des articulations d'une intimité et d'une relation quotidiennes entre les personnes et le tamaris. L'article soutient que les différences entre les discours des publications américaines et mexicaines

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reflètent une relation hégémonique entre les deux pays, également caractérisée par des pratiques contre-hégémoniques. Cette intervention suggère de nouvelles pistes de réflexion sur les espèces introduites à travers le prisme des relations entre l'homme et les plantes, qui approfondit les connaissances politico-économiques existantes.

Mots clés : espèces envahissantes, analyse du discours, frontière entre les États-Unis et le Mexique, relations, militarisme, Tamarix

Resumen

Tamarix spp., también conocido como "cedro salado" o "tamarisco", ha ganado una reputación en los Estados Unidos como planta invasora; con política extendida, se propugna su erradicación en la region del desierto de Chihuahua que abarca los Estados Unidos y la frontera Mexicana. Sin embargo, al sur de la frontera en México, el tamarisco suele estar integrado a la vida cotidiana en terminos más amistosos. Este estudio aplica un lente de ecología política a publicaciones gubernamentales de la conservación ecologica, además de articulos de noticias populares que hablan del tamarisco entre 1995 y 2020, para investigar las narrativas mediáticas y gubernamentales sobre el tamarisco en el suroeste de Los Estados Unidos y en el norte de México como una sola región. Nuestra investigación pregunta: durante los ultimos 25 años, ¿cómo se han interactuado el movimiento, manejo y biocontrol de las plantas tamariscos con los discursos más extensos de la "invasion" en las tierras fronterizas EUA-México? Descubrimos que el gobierno y las publicaciones mediáticas del lado fronterizo estadounidense son mas propensas a demostrar narrativas combativas y jerárquicas que enmarcan las relaciones humano-tamariscas con lenguaje militar; mientras tanto las narrativas mexicanas del tamarisco—particularmente las que estan expresadas en la media de las noticias—son mas diversas, e incluyen articulaciones de una intimidad y relacionalidad entre los seres humanos y el tamarisco. Este artículo argumenta que las diferencias del discurso entre publicaciones de EUA y las de México reflejan una relación hegemónica entre los dos paises que influye no sólo el manejo del tamarisco, sino también la política y pensamiento de la conservación ecológica. Este análisis narrativo sirve en última instancia como una intervención que sugiere nuevos caminos en el pensamiento de las especies introducidas a traves de una perspectiva de las relaciones humano-planta que profundiza los entendimientos existentes politico-económicos.

Palabras claves: Especies invasivas, discurso analítico, la frontera EUA-México, la relación, el militarismo, Tamarix

1. Introduction

Eurasian tamarisk (genus Tamarix), also known as salt cedar or taray, is a shrub or small tree that can be found across the Southwestern US and Northern Mexico, including in the Chihuahuan Desert.[2] Common in arid parts of Europe and Asia, tamarisk was first brought to the North American continent by European trade ships for ornamental purposes in the 1800s (Chew, 2009). Tamarisk quickly gained a foothold in many locations and is now prolific across the arid western US and northern Mexico. First valued by US settlers as a hardy tree that could survive even in difficult conditions, tamarisk is now often portrayed negatively in US popular discourse: as an invasive species and a relentlessly water-seeking disruptor of native habitat in the US and Mexico. This invasion narrative is widespread in scientific publications and policies across the southwestern US. US government agencies and conservation groups justify tamarisk eradication programs – through physical removal and biocontrol strategies – by emphasizing the shrub's invasive characteristics. But non-US and non-scientific sources (both within and outside the US) often contradict the dominant US tamarisk invasion narrative and question tamarisk eradication efforts.

This article examines shifting narratives about tamarisk within and around the Chihuahuan Desert, which straddles the border between the Southwestern United States and Northern Mexico. We follow documents chronicling the movement, management, and biocontrol of tamarisk to examine both how human and other communities across the US-Mexico border interact with tamarisk. We ask: Where did the dominant tamarisk

[2] In North America, there are five common species of tamarisk in the genus Tamarix, though most of these species have now hybridized (usda.gov, 2021). For the purpose of this article, we do not make a distinction between each species, but refer to the whole genus *Tamarix,* except where specified.

invasion narrative come from, and whose interests does it serve? What other ways of seeing and interacting with tamarisk are present throughout the broader Chihuahuan Desert region? We are especially interested in how the US-Mexico political border, which bisects desert ecologies and communities, plays a role in reflecting, shaping, and otherwise entangling tamarisk perceptions, narratives, and materialities. Using concepts from political ecology, feminist theory, and geographies of science to understand published narratives about tamarisk, we find contrasting perspectives that reflect the broader geopolitical context of the Chihuahuan Desert region.

In this article, we first discuss theoretical concepts that help us understand tamarisk as a subject of science, policy, management and care. We then describe the geographic and ecological history of tamarisk in North America and review the evolution of tamarisk management efforts in the southwestern US and Northern Mexico. Finally, we describe our project to collect tamarisk-related narratives from both sides of the border, and present our findings. We show that publications from the US side of the border are much more likely to demonstrate combative and hierarchical narratives that frame human-tamarisk relationships using militaristic narratives. On the other hand, narratives of tamarisk in Mexico are more diverse, and include articulations of relationality between people and tamarisk, which we analyze as a form of quotidian intimacy. We conclude with a rumination on the role of geopolitical hierarchies and hegemonies in the co-constitution of narratives about bodies and about environment. The article argues that differences in media and government discourses reflect power relations between the two countries, which influence tamarisk management practice as well as conservation policy and thinking, and vice versa. This narrative analysis ultimately serves as an intervention that suggests new paths forward in thinking about introduced species through a lens of human-plant relations within political-economic context.

Figure 1: Tamarisk, foreground, re-sprouts after an eradication effort on the Middle Rio Grande in New Mexico, alongside Gooddings willows (Salix gooddingii), background. Source: Authors

2. Thinking conceptually about tamarisk: Invasion and intimacy

In this section, we outline two distinct conceptual approaches to thinking about tamarisk. First, we discuss the narrative of invasion, and use political ecology and feminist theories to show how these ideas emerged through modernist scientific thinking that naturalizes a conflictual approach to tamarisk's presence in the region. Building on these theories, particularly feminist theories of human-environment interaction, we

propose a second conceptual approach to tamarisk: intimacy. We show how intimacy, including the intimate relations between plants and people, becomes a site of geopolitics across borders. We develop these two approaches as a way to organize our findings later in the article.

The framing of tamarisk as an invasive species draws conceptually on the field of invasion biology, which is concerned, broadly, with the changing ecology and interactions brought on through the introduction of a species that does not historically occur in a given area. Published in 1958, Charles Elton's *The ecology of invasions by animals and plants* is the foundational text of invasion biology (Richardson & Pyšek, 2008). Its first chapter, "The Invaders," discussed invasive organisms in terms of "ecological explosions [that cause] enormous increases in numbers in some kind of living organism" (Elton, 1958, p. 7). Elton was concerned with preserving "variety," now known as biodiversity, and framed invasive organisms as enemies of variety that overwhelmed the more peaceful and moderate native species. Elton was also among the first to propose using what he called "counterpests" for biological control of invasive species (Elton, 1958). Since Elton's publication, the field of invasion biology has grown exponentially, and biological "invasion" has become a principal concern among environmental stewards, land use managers, and others both within and outside of academic institutions (Richardson & Pyšek, 2008; Davis, 2009). In the US, invasion biology has given researchers and land managers a framework for understanding and managing the impacts of "invasive" introduced species on ecosystems and economies.

What actually makes a species "invasive," however, has been hotly debated by scholars over the last 20 years. In the Western US context, some apply the terms "non-native," "exotic," or "introduced" to any plant that arrived in North America after the Lewis and Clark colonizing expedition and that is now considered harmful to human activity and/or ecosystems in some way. "Native" plants, on the other hand, comprise all those plants that evolved in North America before the arrival of settler colonialism (Carothers *et al.*, 2020; Davis, 2009). Others argue that the term "non-native" should not be used to denote plants' crossing of political boundaries, but rather ecological zones, regardless of state or national borders (Peeler *et al.*, 2011; Riley, 2005).

Though the terms "introduced" and "invasive" have often been used interchangeably, many scientists and land managers now distinguish between the two. The US government defines an invasive plant as "1. Non-native (or alien) to the ecosystem under consideration, and 2. A species whose introduction causes or is likely to cause economic harm, environmental harm, or harm to human health" (Executive Office of the President, 1999, p. 6183). The Mexican government uses a similar definition: "Invasive species are those which are not native to a place or region, that have been introduced and that find the adequate conditions to establish themselves and reproduce. These species cause grave harms to biodiversity, human health, and the economy"[3] (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, 2010, p. 9; translation by authors). Generally, scientists have conceptualized non-native plants like tamarisk as "weeds," or as plants out of place that disrupt the ordering of environments in which they proliferate (Simberloff, 2012).

In this article, we understand that the framing of tamarisk as invasive is, like the environment itself, socially constructed (see Robbins, 2004). Invasion biology builds on the modernist conceptualization of human-nature relations that emerged during the Enlightenment, a way of seeing the social and natural worlds as separate and distinct, with human capacity – even responsibility – to manage, control, and dominate nature central to human progress (Castree, 2001; see also Taylor, 2015). Political ecologists have long critiqued these frameworks, arguing that "we are inextricably entangled with these species since their invasions originate from our consumptive activities and global movement patterns" (Larson, 2005, p. 496). Political ecologists assert that it is better to accept that humans and nature are hybridized in "invasive networks" (Robbins, 2004) and ask how the social construction of different species – as invasive or otherwise – reflects and perpetuates relations of power in a region (see Castree, 2001).

Indigenous theorists and political ecologists writing about introduced species share a language of colonization and consider entwined histories of rapid land change in the wake of settler colonialism. Current scholarship in this framework is limited. Kimmerer (2013) sees two possible camps for introduced species: they can either be good—"wise and generous" and useful to people—or can be bad, interfering with native plants,

[3] Original text: "Las especies invasoras son aquellas especies no nativas de un lugar o región, que han sid

using up the water (like tamarisk, she notes), and "growing with no regard to limits" (p. 214). Other Indigenous scholars mention the identification of Native people with native plants, drawing explicit connections between plant colonization and human colonization (Corntassel, 2014; Snelgrove, Dahmoon & Corntassel, 2014). Thus, Indigenous, decolonial and other critical literatures in political ecology show how the Cartesian nature-culture divide not only justifies domination of nature but also reinforces gender and racial hierarchies as well (Sundberg, Dempsey & Rojas Marchini, 2020).

Western science plays a central role in the establishment of unequal power relations through environmental management (Lane, 2024). Although modern scientists have long claimed science derives legitimacy from its universal rationality and supposed "placelessness," scholarship on the geographies of science reveals that all scientific claims, practices, and authorities are based in social relations in specific places (Henke & Gieryn, 2008; Livingstone, 1995; Naylor, 2005; Powell, 2007). Even our most synoptic sciences – planetary observation produced by networks of scientists and sites around the globe – generate knowledge that can "emerge only out of a set of geopolitical and technical relations" shaped by race, language, gender, and class (Lehman, 2020, p. 618). Operating across a porous boundary between science and policy, the interactions among "scientific networks and territorial governance structures [produce] complex geographies of social responsibility and collaboration" (Donovan & Oppenheimer, 2015, p. 156; see also Jasanoff & Kim, 2015). By looking closely at the geographies of environmental science and management, we see a "plurality of science-policy interfaces produced by local social orders and global hegemonic ideas and practices," such as the negotiations and conflicts that emerge between policymakers and transdisciplinary climate scientists over research timelines, findings, and leadership (Meehan *et al.*, 2018, p. 774). Just because an environmental management practice or policy claims to be "scientific," then, does not mean it can avoid a key question raised by political ecology: Who benefits from that practice or policy and the science that supports it?

Scientific tamarisk management reflects and perpetuates power relations through the use of invasion narratives that rely conceptually on militarism—the invocation and/or exaltation of military values or ideals, such as the concept of national security and the use of weapons for control—as a principal form of human-plant interaction (Gröning & Wolschke-Bulmahn, 2003; Larson, 2005). Elton's foundational *Ecology of invasions* (1958), which began as a series of radio broadcasts, used militaristic language and metaphors to connect with a broad audience. He strategically deployed militaristic terms such as "explosion" and "invasion" to present convincing arguments about non-native organisms to listeners and readers (Davis, 2009; Elton, 1958) who had lived through two World Wars. More recently, "bioinvasions" including the "routine importations … of harmful non-native organisms" (Meyerson & Reaser, 2003, p. 307) have been highlighted as a threat to national security, requiring "biosecurity" strategies such as controlling entry of plants into the US through security checkpoints (Meyerson & Reaser, 2003). Seen this way, the control of plant invasions requires the collaboration of national security forces and scientists, and invasion narratives fit neatly into geopolitical strategies for national security. Thus, the US use of militaristic approaches to tamarisk and other so-called invasive species intersects with and reproduces other forms of state power.

But there are other possible ways of talking and thinking about tamarisk. Feminist political ecologies increasingly emphasize cross-species care and intimacy as an important, if often invisible, dynamic of plant-people relations (Graddy-Lovelace, 2020; Harcourt, 2019; Harcourt & Bauhardt, 2019). The scholarly focus on care work highlights the labor, often performed by women, to look after and make space for others, including the natural world. Care work is of course not restricted to one gender, or even to humans, but it is central to the project of agriculture, as care for plants, animals, soils, and waterways is necessary for the social reproduction of humans (Graddy-Lovelace, 2018; Rahder, 2014). Care is also an important part of human relations with non-food plants, including the ornamental and medicinal plants spread throughout the world resulting from human migration (Harcourt, 2019). Human-nature relations of caring are not unidirectional. Humans care for plants while plants care for humans: A reciprocal relation that runs both ways without necessarily an instrumental plan to do so (Kimmerer, 2013). Building on feminist political ecologists and others who write about the "everyday doings" of "interspecies care" as a space of moral, ethical, emotional and sensual relationship building, we term these mutual relations of care "intimacy" (Dombroski *et al.*, 2019, p. 112, citing Puig de la Bellacasa, 2011; Bauhardt, 2019; Harcourt, 2019, p. 44). These intimate relations are the stuff of daily life, and this quotidian intimacy provides a second framework for understanding human-tamarisk interaction.

Finally, we consider the geopolitical context in which human-tamarisk relations unfold. Tamarisk is now spread across the Chihuahuan desert, which spans the US-Mexico border. The border not only divides species management efforts, but also shapes the narratives used to understand tamarisk. The US-Mexico border regularly invokes invasion narratives – most often in regard to "invasions" of people and economies, not plants. Yet border materialities are deeply related to conservation discourses and policies (Sundberg, 2006, 2007), and the US's hyper-focus on national security at the border – for example, the construction of a border wall – comes at the price of ecological health across the region (Cantú Ayala *et al.*, 2007). Intimacy is also politicized by the border, as Sara Smith (2020) shows in her work on the India-Pakistan border, where personal choices about sex, marriage, and childbearing intersect with ethnic and religious ties in an intimately heated contestation of power. Keeping ethnic and religious groups separate and reinforcing their distinction is undermined when individuals and couples enter into intimate relations; thus intimacy becomes an important tool of geopolitical struggle. Indeed, the intimate and loving relations between humans are important sites at which geopolitical strategy is animated and made material (Smith, 2020, p. 7).

So too are the intimate relations between people and plants along the US-Mexico border: They make material political hierarchies and geopolitical strategy. Because ecologies are shared across the border, plant-human interactions north of the border affect how plants and humans can interact to the south of it. Border politics shapes the possibilities for quotidian intimacies of plant-human relations, highlighting more clearly the failure of political/ecological dichotomies and the necessity of attention to the intimacy of humans and plants in multi-species entanglements (O'Gorman & Gaynor, 2020).

To examine these dynamics, this article analyzes discursive framings of tamarisk throughout the Chihuahuan Desert ecoregion – and across the US-Mexico border – to better understand the power dynamics underlying movement, management, and biocontrol of tamarisk. Discourse is an important site for the contestation of power; actors use discourse to convince others to adopt their own perspective by promoting that perspective as truth (Svarstad *et al.*, 2018; Foucault, 1991). Discourse becomes an important strategy through which human populations are disciplined and managed because they promote the internalization of these particular perspectives within individual bodies and subjects (Foucault, 1978, 1991, 2002; Legg, 2005). Paying attention to tamarisk discourses helps reveal the play of power across the border. The narratives we highlight reveal which knowledges have become dominant in governmental and popular discourses, while also highlighting anti-hegemonic stories (Harcourt, 2019) that decentralize dominant knowledges and recognize different forms of human-plant relationship.

3. Case study

Background: Tamarisk in North America

This section provides a brief historical overview of tamarisk's presence in North America, including its current range from introduction on the Northeast Coast of the US to the Intermountain West, extending into the Sierra Madre and Chihuahuan Desert regions of Mexico. This overview highlights the changes in management perspectives and strategies over the course of its introduction in the US up to present day.

Tamarisk is native to the arid regions of Europe and central Asia. European trade ships brought tamarisk to the Northeastern US sometime before 1818 (which is well before the creation of the US-Mexican border later that century), when it began to appear in historical records as a tree planted by settlers first for ornamental purposes and later for shade or as a windbreak to protect farmland. The plant quickly gained a reputation in Northeastern and Midwestern settled land for being hardy and vigorous in difficult climates and disturbed soils (Chew, 2009). Based on this reputation, it was planted throughout the rapidly-colonizing Southwestern US by the early 20th century, including within the central valley of the Rio Grande in 1927 (Bryan & Post, 1927). At the time, tamarisk was considered especially suitable for stabilizing eroded riverbanks, as its deep-reaching root systems hold onto sandy, quick-draining, and salty soil where less tolerant plants, including native species, cannot survive (Stromberg *et al.*, 2009). In the 1930s, tamarisk planting became a common activity in conservation-oriented US federal works programs funded by the New Deal, which focused on land restoration

in erosion-prone areas such as the modified waterways of the southwestern US (Chew, 2009; Freudenthal, 1933; Hoover, 1937).

By World War II, however, a different perspective began to emerge in the United States, and US government entities including the US Department of Agriculture and the US Department of Forestry increasingly framed tamarisk as an invasive species that should be controlled by state science. War-effort copper mining in Southern Arizona was one early driver of this shift (Chew, 2009). Phelps Dodge mining company, looking to expand its copper mine in Morenci, Arizona, found itself stymied by the lack of available stream water. In cooperation with other mining companies, Phelps Dodge funded research to identify water competitors, and their research concluded that tamarisks were particularly water intensive and culpable for the dearth of water available for mining (Stromberg *et al.*, 2007). This finding mapped onto an emerging theory developed by US Geological Survey geologist Oscar Meinzer, that "phreatophytes" (plants with root systems in contact with groundwater) used more water than other plants (Meinzer, 1926). Those early studies found that tamarisk had particularly high rates of evapotranspiration, and that it had a higher reproductive success rate than other plants in the southwestern US, spurring further concern about its ability to outcompete other species and reduce overall biodiversity (Stromberg *et al.*, 2007).

During the Dust Bowl Era immediately following World War II, the compounding effects of intensive agricultural land conversion and drought put concerns about water use at the forefront of government attention. Environmental managers and scientists began to focus on tamarisk's water consumption (Meinzer, 1926; Robinson, 1952), and many interpreted Meinzer's theory as suggesting that water could be conserved by removing tamarisk and other plants with root systems extending into contact with groundwater (Chew, 2009; Robinson, 1952). As a drought settled on Texas, New Mexico and Arizona in the early 1940s, during a time of rising anti-immigrant sentiment, popular media in the US increasingly penned tamarisks as "water thieves" and "alien invaders" (Chew, 2009). This narrative led to a decades-long focus on tamarisk eradication through US government programming. Spurred by New Deal policies aiming to provide jobs in manual labor to people displaced by the Dust Bowl, early tamarisk removal efforts used conservation crews to dig out and physically remove tamarisk from stream and riverbanks. By the 1970s, as part of a wave of increased pesticide and herbicide use nationwide, managers began using chemical herbicides to augment the effectiveness of eradication projects, dousing individual stumps after cutting or burning, or simply broadcasting herbicide over entire tamarisk stands (Brock, 1994; Sher & Quigley, 2013).

In the last 40 years, The US Department of Agriculture has shifted gears, turning to biological control of tamarisk as a new approach (Deloach *et al.*, 2007). The US Department of Agriculture (USDA) defines biological control or "biocontrol" as "the reduction of pest populations through the use of natural enemies such as parasitoids, predators, pathogens, antagonists, or competitors to suppress pest populations." (USDA, 2025, para. 1). The explicit expectation is that the introduced biocontrol species will target the problem species and eliminate it from an ecosystem over time (Davis, 2011), or at least reduce it to economically non-important levels (Weeden *et al.*, 2007). After extensive testing on host specificity to ensure that the biocontrol species would not predate species other than tamarisk, in 1985 the USDA settled on a species of beetle native to China and Kazakhstan, Diorhabda spp., including elongata/carinulata and sublineata. USDA set up several pilot study sites in Utah to introduce the beetle as a control for tamarisk, and monitoring results showed that the beetle was likely to be successful in other areas of the Western and Southwestern US (McLeod, 2018).

Just as the USDA's tamarisk biocontrol program was on the cusp of success, the story took another twist. A series of cases in the 1980s and 1990s documented the use of tamarisk as important nesting habitat for native bird species across the intermountain west (Sogge *et al.*, 2003). When the Southwestern willow flycatcher (Empidonax traillii extimus) was listed as an Endangered Species in 1995, bird advocates argued against the use of biocontrol to reduce tamarisk populations, citing the riparian birds' use of tamarisk as vital habitat (Paxton *et al.*, 2011). Initially, the US Fish and Wildlife Service (USFWS) listing of the Southwestern willow flycatcher as endangered attributed its population decline in part to the presence of tamarisk in its primary nesting areas (USFWS, 1995). But there was disagreement over this point, and Southwestern willow flycatcher advocates argued for a pause in the tamarisk biocontrol program.

This opposition slowed the federal commitment to tamarisk eradication in the early 2000s, but some local governmental groups took matters into their own hands. In 2004, the weed management department of

Grand County, Utah, captured around 100 beetles from nearby study areas in Delta, Utah and released them along the Colorado River in Moab, Utah (McLeod, 2018). Several other rogue and official beetle releases around the same time spread the beetles into the upper Colorado River and Rio Grande watersheds. From there, the beetles spread with astonishing rapidity. In 2006, Grand County recorded around 990 acres (401 ha) of tamarisk defoliation along the Colorado River as a result of beetle introductions. By late 2007, the beetles had defoliated nearly 10,000 acres (4,047 ha) of tamarisk along a 70-mile (113 km) stretch of the Colorado River and had also spread into several major tributaries (Sogge *et al.,* 2008). In 2010, USDA researchers released a group of beetles near El Paso along the Río Bravo/Grande, and the beetles crossed into Mexico to a mixture of open arms and great alarm (CONAGUA, 2010). As of 2016, the extent of the Diorhabda beetle range stretched as far south as Chihuahua, Sonora, and Coahuila in Northern Mexico (Sanchez-Peña *et al.*, 2016).

This aggressive biocontrol approach to tamarisk eradication unfolded despite emerging science that questioned the early assumptions about tamarisk water use that had made it a target for eradication in the first place. Beginning in the 1980s, new methods for measuring stand-level evapotranspiration rates led to reconsideration of the impact of tamarisk on water supply (Goodrich *et al.*, 2000). Updated studies found that evapotranspiration by tamarisk was highly varied but that tamarisks generally use water at a rate comparable to their native counterparts in most cases (Cleverly *et al.*, 2006; Hu *et al.*, 2006; McDonald *et al.*, 2015; Owens & Moore, 2007). A 2006 study revealed that the removal of tamarisk stands along stream banks reduced evapotranspiration but increased bare-soil evaporation, leading to net neutral water savings (Hu *et al.*, 2006). Another study found that removal of tamarisk and Russian olive from riverbanks below cottonwoods resulted in short-term water saving but projected the evapotranspiration reduction to be short-lived as the bare soil rapidly gives way to understory regrowth (Cleverly *et al.*, 2006).

These most recent studies debunk earlier claims that tamarisks use more water than their native counterparts, calling into question the widespread perception that the species is harmful simply because it is non-native. Despite this research, however, most government agencies in the US have been slow to adapt their eradication plans. For example, the New Mexico Department of Agriculture published a "New Mexico Non-Native Phreatophyte/Watershed Management Plan" in 2005 that repeatedly asserted the uniformly negative impacts of non-native phreatophytes (NMDA, 2005). The report did not acknowledge the studies cited above, which were published around the same time, nor did it acknowledge contemporaneous works confirming that tamarisk provided integral nesting habitat for the Southwestern willow flycatchers (Rodriguez, 2006; Shafroth *et al.*, 2005; Sogge *et al.*, 2003). A 2003 study had estimated that flycatchers built around 25% of their nests in tamarisk-dominated habitat across their entire range (Sogge *et al.*, 2003), and in 2005, the USFWS had denied permission to introduce tamarisk biocontrol insects in the bird's range, citing concerns that eradicated tamarisk would not be replaced fast enough with native plants to keep the flycatchers alive (USDA, 2005).

Despite this emerging scientific consensus, US narratives continued to portray tamarisk in a negative light. The NMDA 2005 report discussed above gave no citations or scientific reasoning for its negative assumptions about tamarisk, but it confidently advocated tamarisk eradication and proudly displayed the results of a tamarisk eradication project in Albuquerque's Bosque Open Space. As shown in Figure 1, the "Before" photo depicts a mixed stand of cottonwood and salt cedar, and the "After" photo shows bare soil beneath a homogenous stand of cottonwoods.

Just like the persistent assumption that tamarisk is always undesirable in a landscape, Diorhabda beetles also proved difficult to contain. By the time tamarisk science stopped advocating eradication, the beetle had already been released in several areas of the Chihuahuan Desert. Since then, the beetles have spread still further. US introduction of tamarisk beetles into the socio-ecological fold with humans and tamarisks has created a complex and tangled web of relations, with cascading effects on other members of the ecosystems. These effects are not limited to the Southwestern willow flycatchers, as we explore in our study, extending into human ecologic relationships as well.

Figure 2: "Before" (left) and "After" (right) photos of a tamarisk removal project in Albuquerque's Bosque Open Space. Only cottonwoods (Populus deltoides spp. wislizenii) remain. Source: New Mexico Department of Agriculture (2005)

Study area and methodology

This study analyzes conservation discourses on tamarisk within the Chihuahuan Desert ecoregion, because it spans not only a contentious national border but also multiple river valleys where tamarisk is abundant. The Chihuahuan Desert ecoregion extends from southern Arizona, New Mexico, and West Texas to the Mexican state of Hidalgo. It includes the large valley separating the Sierra Madre Occidental and Sierra Madre Oriental mountain ranges through the interior of Mexico. This project is concerned primarily with the northern half of the ecoregion, where the Rio Grande/Río Bravo river basin—including Río Conchos and Río Salado—intersects with the Chihuahuan Desert ecoregion. Researchers are currently developing reliable methods for mapping tamarisk using satellite imagery (Evangelista *et al.*, 2009; Ji & Wang, 2015), but there are currently no detailed distribution maps for tamarisk in Mexico. The most recent reports on the plant have indicated that it currently exists in the states of Coahuila, Sonora and Chihuahua, and throughout the course of the Río Bravo/Grande (CONABIO, 2014; Glenn & Nagler, 2005).

To trace narratives and look for discursive themes, we examined governmental documents and news media published between 1995 and 2020. We examine two main types of texts: 1) existing conservation policy and management documents from US and Mexican governmental agencies (Table 1), and 2) news and media—both US and Mexican—covering tamarisk in English and Spanish. This allowed us to examine both official discourse as well as popular portrayal and understanding of tamarisk. The keywords we used to search governmental and news media archives were: tamarisk, Tamarix, salt cedar, saltcedar, athel, *tamarisco*, *cedro salado*, *pino salado*, *pinabete*, and *pinavete* (the last two terms are homonyms; "*pinabete*" is more common but both spellings are used). We identified relevant policy documents focusing on five Mexican agencies and five

US agencies (Table 1), first screening the pool of existing conservation documents based on these keyword searches. The official conservation documents we used in this study are free and openly accessible via online document archives.

Mexican Agencies searched	US Agencies searched
Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT)	US Department of Agriculture (USDA)
Comisión Nacional del Agua (CONAGUA)	US Fish and Wildlife Service (USFWS)
Comisión Internacional de Limites y Aguas (CILA)	US Forest Service (USFS)
Comisión Nacional de Areas Protegidas (CONANP)	Bureau of Land Management (BLM)
Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO)	Bureau of Reclamation

Table 1: Mexican and US governmental agencies whose archives the researchers searched for conservation policy documents, press releases, and memos mentioning tamarisk.

The study relies primarily on document analysis because it took place during the COVID-19 pandemic lockdowns, when connecting with individuals for interviews or travel to field sites was disrupted. Government and media offices were shuttered and many staff had not yet transitioned to remote work, and thus it became difficult to identify and connect with likely interlocutors either virtually or in-person. Funding for further research was not available post-pandemic. For these reasons, we prioritized document analysis for data collection. We did, however, also conduct four supporting interviews with two participants in Mexico: an entomologist studying tamarisk beetles and a government official with CONABIO; and two participants in the US: a journalist focusing on water issues and a government official with the USFWS. All of the respondents had experience with tamarisk studies and/or management.

We sourced media coverage of tamarisk from the Southwestern US (including the states of New Mexico, Arizona, and the western portion of Texas) and Northern Mexico (including the states of Coahuila and Chihuahua) using the online databases Prensa Escrita and United States Newspaper Listing. After identifying the search terms listed above to encompass tamarisk's colloquial names in Spanish and English, we filtered news articles in publication archives by mentions of tamarisk. Through an exhaustive search through each of the agencies and publishers listed in Table 1, we gathered and analyzed a total of 139 documents and articles: 16 Mexican governmental documents, 18 US governmental documents, 30 Mexican news media articles, and 86 US news media articles. The difference between the number of US news media articles and Mexican news media articles likely reflects more extensive news coverage of tamarisk in the US.

We qualitatively coded each article and document to highlight patterns and to find thematic connections and disparities between data sources. We did an initial read-through of all the data, then sorted the documents by source category (policy document, news article), and the publishing company or agency, using the coding software NVivo. We then developed a set of codes that captured salient patterns in discourse. The coding strategy was inductive and deductive: First, we used codes based on ideas and themes from the literature reviewed above.[4] We then added codes to organize themes observed in the documents themselves.[5]

[4] Deductively approached codes included, for example, "water use", "land use changes", "ecological restoration", "use in restoration", "effects on biodiversity", "aesthetics", "militarism", "tamarisk beetles as tool", and "tamarisk beetles as plague."

[5] Inductive codes that emerged through the coding process included "fire", "urban/rural location", "decision to release beetles" and "intimacy with tamarisk."

4. Results

The results are organized in two parts. The first examines narratives about tamarisk management that are shared by governments on both sides of the US/Mexico border, looking specifically at government-sponsored conservation goals. The second section names and unpacks which narratives do *not* cross the US/Mexico border, focusing on the distinct contrast between militaristic language in US conservation discourse and the intimacy of Mexican vernacular relationships with tamarisk.

Shared narratives

> Tamarisk is one of the lessons in American West 101: About the time newcomers learn that the striking black-and-white bird on their porch is a common magpie, they find out that the feathery green riverside shrub with the pretty pink sprays of flowers is actually a nasty weed."
>
> Michelle Nijhuis for *High Country News*. November 26, 2007

Two conservation-motivated narratives on tamarisk run concurrently within governmental agencies on both sides of the border. The US Department of the Interior and Mexico's Secretaría del Medio Ambiente y Recursos Naturales (Secretary of the Environment and Natural Resources, SEMARNAT) both strive to improve the functionality of ecosystems through scientific control of tamarisk, and both embrace the idea that ecosystem health can be improved through tamarisk removal.

The idea that biodiversity is an important determinant of the beauty and functionality (often referred to as "health") of ecosystems became a central concept in restoration ecology following the work of Elton (1958). The ecological concept of competition, wherein one species consumes or makes unavailable essential resources for another species, is central to ecological health. In 17 out of the 30 government documents analyzed for this study, both US and Mexican conservation agencies depicted tamarisk as in competition with—and outcompeting—native species as their rationale for eradication or control measures. This assertion was based on two main ideas related to ecological competition. First, tamarisks are noted for increasing soil salinity, making the soil surrounding tamarisk plants uninhabitable for other plant species (Arndt *et al.*, 2004; Ohrtman & Lair, 2013; Thomson *et al.*, 1969). Second, and most popularly, is the idea that tamarisk uses an egregious amount of water compared to native species sharing its ecosystem niche (ie; cottonwood and willow). Although the theory that tamarisks use more water than native species was debunked by studies in the early 2000s (Cleverly *et al.*, 2006; Goodrich *et al.*, 2000; Hu *et al.*, 2006; Owens & Moore, 2007), this narrative remains ubiquitous in governmental documents from both sides of the border during the time period analyzed for this study (1995-2020).

Human alarm about lack of water in the Chihuahuan Desert is not misplaced. There is increasing human demand for water while the amount of water in this ecoregion is, overall, declining and projected to continue to decline in future climate change scenarios (Gonzalez *et al.*, 2018). Concerns about tamarisk water use seem to have peaked among US and Mexican government agencies around the time that new studies emerged in the early 2000s showing average to low comparative water use by tamarisk. A variety of tamarisk water-use values were in circulation at this time: from "between three and seven acre-feet [3,700 and 8,634 cubic meters] of water per year," (Hosler, 2005, para. 1) to "more than twice as much water annually as all the cities in southern California," (Invasive Species Advisory Committee, 2006, p. 5) to "annual water loss estimated to be as great as 2.5 million acre-feet [3.1 billion cubic meters] per year" (Nelson, 2004, para. 1). These values are commonly associated with monetary losses. In 2016 the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (National Commission for the Knowledge and Use of Biodiversity, CONABIO) estimated annual losses of US$133 to 285 million due to tamarisk water use. Concern about tamarisk water use echoes across government agencies in the region, with epicenters in the USDA, US Bureau of Reclamation (USBR), CONABIO, and the Comisión Nacional de Areas Naturales Protegidas (National Commission of Natural Protected Areas, CONANP), as well as US news media publications.

While the USDA and USBR appear to form a coalition of defense of the water use narrative and their justification of tamarisk removal projects of the past 25 years, this claim is poorly supported by science. The

most common tamarisk water use metric of 200 gallons (757 l) per day is often attributed to a now-unavailable paper published by the USDA in 1987. A report from the proceedings of a 1987 conference on tamarisk control includes Hoddenbach stating this metric (Hoddenbach, 1987, p. 119), but no other articles from this year appear to produce this metric. A CONANP educational pamphlet on tamarisk management reads: "Another impact of tamarisk is its high water consumption. A single tree consumes 200 gallons, the equivalent of 770 liters of water per day (Hoddenbach, 1987), a quantity that depends on the amount of evapotranspiration and is dependent on the availability of water, stem dimensions and climatic conditions (Davenport *et al.*, 1982)" (CONANP, 2015; translation by first author). Doody *et al.* (2011) note that the 200 gallons per day metric does not appear to be supported by the research in the Hoddenbach (1987) article, and that the article's original source remains unknown. The authors were unable to locate the original text from the Hoddenbach article. In this study, the 200 gallons per day metric was present in 17.2% of all US and Mexican government and news publications that discuss tamarisk water use.

CONANP's use of US-based studies referenced in US governmental documents is part of a larger trend suggesting a narrative trajectory moving from the US to Mexico. Many of CONANP's mentions of tamarisk water use include references from the same studies that US governmental agencies cite as proving tamarisk's high water use. More recent governmental documents from Mexican agencies (2016-2020) skirt the issue of reconciliation with new studies and opt to simply not mention water use in their rationale for tamarisk eradication objectives.

The water use narrative, though, has begun to lose ground in the US, especially in the USFS and USFWS. A 2020 publication from USFS on tamarisk reads (Carothers *et al.*, 2020, p. 18): "Findings indicate that the [Tamarix] species complex is a stress-adapted group with a low to moderate water consumption that primarily replaces native vegetation when conditions within watersheds that have become unsuitable for native species colonization (Nagler & Glenn, 2013; Nagler *et al.*, 2012)." US news sources, too, have largely turned away from the high-water use narrative since around 2010 and have started acknowledging academic studies released in the early 2000s that disproved the water use theory. US journalists now often include a note about the most recent science regarding water use, often citing a failed water-savings project along the Pecos River, in which managers eradicated tamarisk from the river corridor in order to increase streamflow. "The effort failed to generate the promised water," a reporter for the *Albuquerque Journal* wrote in 2014. "Texas sued because New Mexico failed to deliver its legally required share down the Pecos at the New Mexico-Texas border, and New Mexico ended up spending US$100 million buying up and retiring agricultural water rights instead" (Fleck, 2014, para. 6). Thus, we see once-shared scientific claims about tamarisk between the US government and Mexican government, and especially justifications for its eradication, becoming distinct from one another.

Invasion

In US journal articles about tamarisk, military metaphors abound. Article titles can be especially indicative: "A War on a Weed" (*Albuquerque Journal,* 2003), "Alien Invasions" (*High Country News* 1997), "Taking Up Arms Against Trees," (Soussan, 2003), "Beetle Warfare" (Nijhuis, 2007), and "It's 'bombs away' on New Mexico's saltcedar" (Krza, 2003). All articles with the code "militarism" (29 news articles and 1 government document) came from US documents, and 29.25% of US news articles presented with at least one reference to militaristic language.

Militaristic language often shared space or overlapped with discussion of "aesthetics" and "ecosystem health." US journalists writing about tamarisk often use it to make an aesthetic distinction between a healthy, vibrant ecosystem and one that has been neglected or degraded. The general attitude toward the plant is negative, and its positive uses by humans or wildlife largely left unmentioned. A main focus is on the obstruction the tamarisks pose on riverbanks where people want to recreate: "Carved out of a nearly impenetrable forest of water-robbing salt cedar and thorny Russian olive trees, the state Game & Fish Department has turned its Hammond Tract into what should become a very popular recreational area" writes Moffatt (2013).[6] In another example, the coordinator of a project to clear out tamarisk is quoted in the US magazine *El Defensor Chieftain*

[6] No associated page number.

(2018)[7] as stating: "That's why we spent all this money with all the picnic areas, and clean up all the salt cedar so you can see the river while you're walking the trail." The phrase "cleaning up" when referring to tamarisk is a decision to frame the plant as something dirty, or out of place (Sundberg & Kaserman, 2007)—that, when removed, beautifies a space and appeals to people wanting to recreate with a clear view of the river.

The adjective "invasive," while common in referring to nonnative species that cause harm, has a fundamentally militaristic connotation, as discussed above in Section II. Use of the word "invader" is territorial, representing a geographic transgression, as in "alien invader," or an "invasion of territory." Further, there is a tendency in US news articles and government documents on tamarisk to nominalize the adjective in "invasive species" and shorten it to "invasives" (Goldfarb, 2014; Hosler, 2005; Keller, 2013; Setziol, 2011). This nounification resembles another popular linguistic move in the US to refer to "people who cross the US/Mexico border illegally" as, simply, "illegals" (Flores & Schachter, 2018). In contrast, language in Mexican news and government documents tend to keep the original phrase, using "*las especies invasoras*" ["invasive species"] rather than shortening to "*las invasoras*" ["invasives"] (CONABIO, 2010; Cruz, 2017a; Martínez, 2017). The presence of "*species*" or "*people* illegally crossing" dramatically changes the tone of the phrase and reveals a sentiment toward perceived outsiders that acknowledges their human-ness, plant-ness, or—at least—the possibility of their intrinsic value. Thus, there is a parallel use of invasion narratives both when talking about the eradication of tamarisk and in discussing undocumented crossings of the border by humans. Both reflect something foreign and non-native, something targeted for expulsion or eradication.

But there is also an interaction between the discourses of the invasiveness of tamarisk and undocumented border crossers. The "cleaning up invaders" narrative is used journalistically not only to refer to tamarisk removal projects for environmental reasons but also those aimed at rooting out people illegally crossing the border, or participating in other forms of crime. Tamarisk form dense stands "thick enough to hide a meth lab—which they have, in fact, been known to do," notes Cally Carswell for *High Country News* (2015, para. 42). Another article from the same journal writes with surprise on the involvement of the US Border Patrol in tamarisk eradication. "Twenty-foot-high walls of tangled branches mask people standing 10 feet [3 meters] away, says Dominguez, making bandits virtually invisible. 'I wouldn't send my worst enemy down there to hunt or fish,' agrees lead restoration planner Fred Phillips. 'Hunters Hole is rampant with crime.' […] It became a forgotten place, where bandits and illegal immigrants hid amid the brush" (Heim, 2007, para. 9). The news journal *Texas Monthly* notes, "Looking around at the thick, twelve-foot-tall salt cedar that provided cover for almost 150 miles [241 km] upstream and 90 miles [145 km] downstream, it was clear to me that a conga line could cross through the water anywhere and avoid unwanted attention" (Vine, 2008, para. 6). Thus, news media in the US reveal a militaristic narrative of invasion about tamarisk, linking the plant with crime and illegality that endangers US citizens and threatens US national security.

We did find some evidence that tamarisk was seen as a nuisance in Mexico as well. Some farmers are fed up with the ubiquity of tamarisk presence in their fields. Sergio Sanchez-Peña, an entomologist from Chihuahua who studies tamarisk beetles, has received several requests for beetles from farmers further south in Nuevo León, hoping to reduce labor costs involved in clearing tamarisk from their fields (interview, June 2020). But Mexican news sources stop short of the discursive militarism found in US news sources.

Intimacy

In Mexican news articles, by contrast, the only reference to tamarisk posing an access problem is a report of an effort to clear out a stand in an Allende (Coahuila) cemetery so that families can have easier access to their deceased (*El Zócalo*, 2017a). In contrast to US discourses of invasion, Mexican sources draw attention to a variety of relationships defined by care and interdependence. These sources highlight quotidian and reciprocal relations of care that suggest an intimacy – a deeply personal familiarity – between humans and tamarisk within Mexican narratives.

News articles from Chihuahua and Coahuila reveal the roles tamarisk has played in arid, agricultural Northern Mexico. A journalist with *La Jornada* states that the tamarisk's sprays of pink flowers are an important

[7] No associated page number.

resource for bees and their farmers (Villalpando, 2010), and the tamarisk's sap is used to roast chipotle chiles: "It imparts a unique taste." (Gallegos, 2013). Many articles published in Mexico mention that tamarisks serve as windbreaks along the edges of agricultural fields and stabilize eroded ditch- and river-banks where native trees cannot survive (Cruz, 2017c; *El Heraldo de Chihuahua*, 2019; Gallegos, 2013; Villalpando, 2010).

In Northern Mexico's urban and residential areas, tamarisks are one of the hardiest and longest-living shade trees. A species of Tamarix not often found further north, called Tamarix aphylla (also known as athel) is taller, thicker in trunk diameter, and more treelike in stature than its shrubbier northern relatives, and can live to well over 100 years (Tesky, 1992). In news articles, the name "*pinabete*" is often used to identify athel, but can also describe other plants in the Tamarix family. The athel is often cultivated as a shade tree, and it exhibits the tamarisk trait of drought hardiness and tolerance of salty and degraded soils. This is in distinction to the treatment of Tamarix in the United States, where there is a strong pushback against previous eras of Tamarix cultivation that prioritized the plant for similar reasons. Of course, in political ecology terms, the context differs between rural and urban spaces, but even (or, perhaps, especially) in urban areas in the United States, tamarisk is targeted for eradication (see, for example, Figure 1 from Albuquerque's tamarisk removal project).

News articles indicate that the athel is a beloved tree found along residential blocks and ringing plazas (*El Diario de Juárez*, 2013 Flores, 2018). The city of Delicias, Chihuahua, was the site of local outrage in September 2019 when an individual hired loggers to cut down and burn a stand of athels on an *ejido* (communal land) to clear a walking path to a housing development. *El Heraldo de Chihuahua* released a series of scathing articles and social media posts on the event, calling it a devastating "*ecocidio*" (ecocide) of trees as old as 60 or 70 years (Ponce, 2019). A city official interviewed for another *Heraldo* article lamented the lack of recourse for those responsible for the *ecocidio*: "The councilor said she did not know how this crime against the environment could be punished, mentioning that lately there has been more citizen concern for conserving green spaces" (*El Heraldo*, 2019, para. 4, translation by authors). Some townspeople also argued that they should have been informed of the plan to remove the trees so that they could have used the materials—that the burning of the trees was a waste of resources (*El Heraldo de Chihuahua*, 2019). Others mourned the athels, noting again the trees' age ("*centenarios*," hundred-year-olds) in recounting their anger at the removal project (*El Heraldo de Chihuahua*, 2019). None of the articles on the event mentioned invasiveness or non-nativeness as possible justification for the removal of the athels. The public outrage in response to the removal of the stand of athels in Delicias indicates that the trees are beloved there, and deemed worthy of protection.

In 2010, the USDA released tamarisk beetles in Presidio, Texas, just over the border from the Mexican town of Ojinaga. The beetles quickly moved along the Rio Bravo/Grande and its tributaries. According to USDA documents, a group of Mexican scientists and officials had "agreed to not oppose the release" (Deloach *et al.*, 2007, para. 1), but the USDA and the officials they refer to did not appear to have consulted or communicated with affected regions near the release site (Zamorano, 2012). Over the following five years, a wave of articles on the beetles' arrival flowed from Chihuahuan news journals. Unlike US news media coverage of the introduction of beetles, Mexican media reflected a sense first of alarm, then mourning. The first article to come out about the tamarisk beetles in Mexico was titled "A plague attacks the tamarisks" ("Plaga ataca los pinabetes", *El Diario de Juárez*, 2013). "The infestation of a plague" was the most common framing in subsequent news articles on the arrival of tamarisk beetles in Mexico. The city of Juárez released an urban reforestation plan, worried that the city would lose its green spaces when the beetles fully defoliated the parks' tamarisks (*El Diario de Juárez*, 2014). This language is similar to the invasion narratives used in US narratives, but points to concerns about the vulnerability of beloved friends rather than a militaristic invasion.

The USDA beetle release also had economic consequences for farmers. *La Jornada* reported (as of September 2010, the same year that the beetles crossed the border into Ojinaga and surrounding areas) that beetles had destroyed 1,500 hectares of tamarisk around Ojinaga, depressing the income of many of the area's apiculturists. The farmers reported "swarms of beetles," and local officials promised to "present the neighboring nation [US] with an analysis of harms with a request for economic support" (Villalpando, 2010, translation by first author). A 2013 article in *El Diario de Juárez* frames the conflict as a result of negligence on the US's part:

> 'While in the United States they consider the salt cedar a threat to their environment, on this side of the border it is given special value because it is used as shade for livestock, as a control for wind erosion, that is, wearing away of rocks or the removal of soil by wind,' said Lucio López, of the local plant health board in the Juárez Valley. 'They sought to solve a problem on the other side of the border, but unleashed one on this side.' (Gallegos, 2013, para. 9, translation by authors)

Some Mexican government documents also express trepidation in response to the beetle release. A 2010 press release from the International Commission of Boundaries and Waters between Mexico and the United States (CILA) immediately following the release called the US's move "unilateral," suggesting that CILA was not aware of the agreement from Mexican officials cited by the USDA. The document, while stating that the tamarisk is known for high water use, also stresses the importance of tamarisk to farmers in the rural areas surrounding Ojinaga. A researcher in Mexico has made several public calls for monetary settlement and support from the US government considering the economic and social repercussions of the release, as well as stressing the importance of binational communication and collaboration to monitor the beetles (Zamorano, 2012, 2013).

Figure 3: Tamarisk in a garden in Albuquerque, New Mexico. Source: Authors

While governmental agencies across the US-Mexico border appear to share several key narratives about tamarisk, examination of news media documents reveals two distinct constructions of intimacy between humans and tamarisk on each side of the border. US news media tend to look at tamarisk through a militaristic lens and in relation to human and plant bodies crossing national borders. Mexican news media more often see tamarisk through a lens of care and in relation with communities and livelihoods. We understand these differences as two sides of the same hegemonic coin; US militarism frames tamarisk as an issue of national security, and in doing so ignores and subverts the intimate vernacular relationships with tamarisk found in Mexico.

5. Discussion

Narratives of quotidian intimacy found in Mexican media may seem to stand in stark contrast to the militaristic metaphors operating on the other side of the border, yet these narratives are fundamentally intertwined. Both reflect the socially constructed nature of human-environment interactions (Haraway, 2019), since there is nothing "natural" about the tamarisk invasion metaphor in the US or about the construction of a familial role for tamarisk in Mexico. US governmental discourses not only use science to produce a militaristic program focused on tamarisk eradication, but they also shape the possibilities for human relationships with tamarisk beyond US borders through biocontrol tactics. Thus, building on the work of Sara Smith (2020) and Stoler (2002), we suggest that the quotidian relations between humans and tamarisk are one way that geopolitics across the US-Mexico border are animated and made material.

Geopolitics and care

Lucio López's callout of the US's lack of consideration for Mexican farmers in *El Diario,* CILA's press release, and Zamorano's criticism of the USDA decision to release beetles at the border illustrate a common theme: The US treatment of tamarisk as a problem and US lack of consideration for collateral damage in Mexico has been met with alarm and frustration from Mexican environmental officials and civilians, both rural and urban. These sources indicate that tamarisk is a daily part of Mexican lives, supporting livelihoods by helping apiculture and creating shade for livestock, as a resource to cope with erosion, as something that beautifies their space, and even flavors their food. Mexican outcry at the loss of tamarisk demonstrates emotional, moral, and economic relations of care (Graddy-Lovelace, 2018; Kimmerer, 2013; Rahder, 2014), which we identify as plant-human intimacy, drawing on feminist political ecologists (Bauhardt, 2019; Dombroski *et al.*, 2019; Harcourt, 2019).

This trend is wrapped up in the larger context of US border militarism that situates US interests before, and with little consideration for, the interests or experiences of Mexicans. While tamarisk can sometimes be a nuisance to Mexicans, our study found many more cases of humans interacting with tamarisk through relationships of quotidian intimacy. We find both commonalities and distinctions in publications about tamarisk in the US and Mexico. In both US and Mexican governmental documents, tamarisk management is described in the language of Western science, using powerful precepts that assume a fundamental human control over nature (Castree, 2001; Taylor, 2015). Yet many publications in Mexican news media also engage an emotional vantage that directly considers the human-tamarisk relationship. In these publications, we find two distinct narratives that are largely confined to one side of the border or the other. In US news publications, narratives deploy militaristic analogies of war and combat to pose the human-tamarisk relationship as antagonistic and hierarchical, with humans standing firm against the "invasion" of tamarisk. South of the border, however, we find news media narratives focused on daily interactions and care between humans and tamarisk.

US hegemony: Science, national security, and ecological domination

Discourses about tamarisk north and south of the border reflect the long history of US-Mexico relations – shaped by colonization, economic hegemony, and resistance – both in their shared characteristics and in their distinctions. Government publications in both the US and Mexico expressed a strong commitment to scientific management as a foundation for ecosystem health, reflecting the primacy of US-developed approaches to tamarisk eradication and biocontrol commitments. But even when publications from the two countries diverged in their narratives about tamarisk water use, they reflected the same primacy of US governmental narratives.

The US publications' use of militaristic language and metaphors presents a sharp contrast with Mexican media language of lament and a focus on loss following eradication efforts. In both cases, however, the narratives of invasion and intimacy generate human-tamarisk relationships within the context of US hegemony. The US government's and US media's discursive framing of tamarisk solely as a problematic invasive species forms the basis for unilateral conservation decision-making (Cantú-Ayala *et al.*, 2007), which we see as an example of US hegemonic control in the Chihuahuan Desert region.

By examining this contrast and exploring the human-tamarisk relations of intimate care articulated in Mexican news media narratives, this article makes visible the political ecology of tamarisk science and management. On one hand is the ideology of nature-culture division and the necessary exercise of human control over nature emerging from the Enlightenment. On the other hand is the ideology of national security (Meyerson & Reaser, 2003), which became the basis for clearing tamarisk from rivers and thinning forests to create greater visibility to prevent crime, including illegal border crossings. Closely connected to security is order, and documents from US newspapers and government documents identify goals of cleaning up and getting rid of foreign materials (Sundberg, 2006). Within these narratives, there is a strong parallel between "invasive" plants (tamarisk) and "invasive" people (migrants). Thus, there is a direct link between border militarization, US management decisions, intimate lives, and tamarisk, where beetles are released in order to achieve tamarisk defoliation to expose immigrant bodies.

Science is implicated in this political work, despite many scientists' continued self-construction as objective and neutral. Scientific frameworks helped justify beetle releases by identifying the deleterious biological and biodiversity effects of introduced species and characterizing the supposed hydrological excesses of phreatophytes (Meinzer, 1926), and scientific expertise helped ensure that early claims about tamarisk water use have continued to circulate long after they were disproven by other studies. But tamarisk's defamation was always connected to geopolitical contestations over national security. Recall the initial claims that tamarisk disrupted private mining company access to water, within the context of World War II (Chew, 2009; Meinzer, 1926; Stromberg *et al.*, 2007). Then, as now, human-tamarisk relations were equally or perhaps even more political than scientific. Our findings thus draw from and contribute to scholarship that emphasizes the deeply place-based nature of scientific knowledge and its circulation in geopolitical context (Donovan & Oppenheimer, 2015; Jasanoff & Kim, 2015; Naylor, 2005).

Counter-hegemony: Intimacy of human-nature relations

In sharp contrast to the militaristic narrative of invasion that dominated US publications, we analyzed Mexican news articles that focus our attention on different possibilities for engagement between humans and tamarisk: Relations based on intimacy and care rather than on militarism and control. We found narratives focused on intimacy and care mainly circulating through news journalism, although some Mexican government agencies (such as CILA) also expressed concern for how the USDA's beetle release affected the livelihoods of Mexican citizens. These Mexican sources provide stories of apiculturalists who have lost a valued business partner and of collective mourning in the wake of an "ecocide" that removed a stand of 100-year old tamarisks, demonstrating that the possible ways of knowing tamarisk are more abundant than the US news and government publications explored in this study would suggest. Throughout the articles and documents, most Mexican sources refer to athel as a species, whereas US sources refer more generally to tamarisk as a genus. This indicates a focus in Mexico on individual species characteristics, including those that are quite valued, while the US focus abstracts across the entire genus in ways that obscures valuable characteristics between tamarisk species.

Our study used a document-based approach to identify these key narratives, but future research could build on this work to engage with individual plant-people relationships in the Chihuahuan Desert. Ethnographic methods (such as those used by Rahder, 2014) could offer a deeper understanding of the role of intimacy in engaging and subverting dominant geopolitical narratives, and would be more suitable for exploration of perspectives from Native people in the region. Future research could also address the complexity of different individual and group perspectives on tamarisk, elucidating Indigenous, Hispano/a, mestizo/a, and immigrants' framings of tamarisk. Because our study was limited to analysis of publicly-available documents, it is missing

other important ways of knowing tamarisk and relating with non-native species more broadly. Specifically, future studies should consider exploring perspectives of Indigenous people on tamarisk across the Chihuahuan Desert region. Additionally, this study's geographical focus on one region in North America does not tell a full story about the same plant in its many other new and historically important ranges. A similar comparative discursive study that looked at different regions together could yield new understandings of how people perceive and interact with tamarisk in different parts of the world.

6. Conclusion

Based on the findings of this study, we argue that there is nothing natural about the villainization of tamarisk along the US-Mexico border; discursively framing tamarisk as invasive clearly serves the geopolitical goals of US hegemony. While the presence of tamarisk along rivers is often presented as a resource management problem – supported by now-debunked science on tamarisk's excessive water use – the efforts to remove it are political and ideological.

Our research also finds that despite the power of US governmental narratives, which often cross the border with great influence, Mexican news media narratives of tamarisk-human relations reveal intimacies of care more than the militaristic discourses of invasion most often seen in the US media. In US news publications, narratives center on conflicting and problematic human-tamarisk relationships, using an invasion narrative to justify eradication strategies that disrupt quotidian intimacies south of the border. Across US news media sources and both US and Mexican government publications, tamarisk is cast as an adversary, and the human relationship to tamarisk is assumed to be combative and hierarchical. But despite the power of these narratives and the widespread scientific justification of tamarisk control, sources from Mexico emphasize that people there have different contemporary and historical patterns of interaction with tamarisk. In Mexican homes, on Mexican fields, and across Mexican public lands, people are demonstrating that nature-culture divisions are not universal. In the Chihuahuan Desert, tamarisks are more than thirsty invasive shrubs; they are companions and coworkers in the sunbaked fields and plazas, intimately intertwined in the daily lives of people.

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