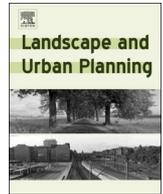




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Research Paper

# Social impacts of homelessness and long-term occupancy on national forests and grasslands: A national study of U.S. Forest Service law enforcement officers<sup>☆</sup>

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## ABSTRACT

Long-term occupancy by homeless individuals in U.S. national forests and grasslands results in persistent management challenges and resource concerns. Management challenges associated with non-recreational campers (homeless long-term occupants) include: maintaining sanitary conditions, public safety, vandalism, and conflict with other forest visitors. These management challenges may already be a substantial concern for district rangers and law enforcement officers (LEOs) in many parts of the U.S. This exploratory study compares the social impacts of various types of non-recreational campers across different forest types in the U.S. In this paper, we compare the prevalence, social impacts, and types of criminal behavior associated with non-recreational campers, along a rural to urban forest continuum. ANOVA analysis reveals that transient retirees are most frequently encountered by law enforcement, with no differences apparent among forest types. Teens and runaways were least often encountered, but this group demonstrated a significant difference in frequency of encounters between rural and urban locations. In terms of conflict, LEOs reported that Forest Service staff are the group most frequently experiencing conflict with non-recreational campers, with no significant differences found among the forest types. With respect to unlawful behavior among the homeless on national forest lands, LEOs reported having to respond to stay violations most often, with no differences found among different forest area types. This paper considers these outcomes and the management challenges they represent.

## 1. Introduction

Homelessness is a persistent social challenge in the United States (Handler, 1992). In January 2016 over half a million people in the U.S. were classified as homeless (U.S. Department of Housing and Urban Development, 2016). By some estimates, the number of homeless in the U.S. can be counted in the millions (Baker, Elliott, Williams Mitchell, & Theile, 2016), a number that places considerable strain on city and agency budgets nationwide. A New York City study (Culhane, Metraux, & Hadley, 2002), found that the average annual costs of public services for a single mentally ill homeless person totaled approximately \$40,000 (in 1998 dollars). Programs established to provide aid historically focused on the individual as the locus of the problem (Shinn & Weitzman, 1990), but more recent attention has been paid to combinations of factors leading to homelessness, and more innovative policy responses (Lee, Tyler, & Wright, 2010).

In the 18th century U.S., individuals who had fallen on difficult

times relied primarily on family and kinship networks to provide aid and a pathway back to self-sufficiency (Hooper, 2003). According to Cronley (2010), beginning in the mid-nineteenth century institutionalized care for the homeless began to take over from families and other personal networks of support. This same period saw a shift in perceptions of the homeless influenced by Social Darwinism and English laws. English Poor Laws severely stigmatized the poor and homeless, portraying such individuals as deviant and deserving of their fate (Phelan, Link, Moore, & Stueve, 1997). In modern America, the causes of homelessness continue to be perceived by many as being the responsibility of homeless persons themselves (Ravenhill, 2008). General public perceptions of homeless people as lazy, unmotivated, and entirely responsible for their misfortunes are common (Mitchell, 2011). The reality, however, is that the root causes of homelessness are much more complicated (Morse, 1992). More contemporary perceptions reflect a growing awareness of this complexity and recognition of the pervasiveness of mental health challenges and addiction among the

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homeless.

Pathways into homelessness are complex and multidimensional (Mitchell, 2011; Nooe & Patterson, 2010). Research suggests they generally can be divided into two broad categories: social-structural and individual causes (Somerville, 2013). Social-structural causes are social influences or institutions that include employment opportunities, housing prices and stability, pervasive poverty, availability of public services, access to health care, and low wages (Nooe & Patterson, 2010). Individual causes include age, mental health, family background, physical and emotional abuse, substance abuse, gender, and ethnicity (Fazel, Geddes, & Kushel, 2014; Thompson, Wall, Greenstein, Grant, & Hasin, 2013). Each person's pathway into homelessness appears to be a unique combination of social-structural and individual factors (Somerville, 2013). A combination of mental health challenges, substance abuse, and an absence of a social support network seems to be the biggest contributor to homelessness (Kim, Ford, Howard, & Bradford, 2010; Padgett, Stanhope, Henwood, & Stefancic, 2011). The pervasiveness of substance abuse among homeless people is highlighted by the results of a Canadian study that found 50% of cases of deceased homeless people were attributable to drugs or alcohol (Page, Thurston, & Mahoney, 2012). Prevalence of homeless in public areas, impacting public health and safety policy (Baillergeau, 2014), has necessitated public agency responses that have been varied and often costly (Gilmer, Manning, & Ettner, 2009).

Public services for the homeless include counseling, job training, substance abuse counseling, and shelters (Ravenhill, 2008). Some homeless persons are reluctant to avail themselves of services (Hoffman & Coffey, 2008) or face barriers to accessing these services; and, homeless individuals with substance abuse and mental health issues often remain chronically homeless (Chamberlain & Johnson, 2011). Shelters are often thought to be a reasonable temporary response to homelessness, and other services seek to transition homeless individuals to more permanent lodgings (Brown & Wilderson, 2010). However, some homeless individuals are reluctant to stay in shelters due to concerns about safety, sanitary conditions, mistreatment by shelter staff, or fears about their children's safety and well-being (Hinton & Cassel, 2013; Meanwell, 2012). Others choose to live outside shelters to remain with animal companions that shelters are not equipped to care for (Click, 2015; Kim and Newton, 2014). Rather than stay in a shelter, many homeless individuals opt instead to create temporary housing in parks, open spaces, and on public lands, placing increasing pressure on land management agencies such as the U.S. Forest Service (USFS) to manage homeless users.

Homelessness is often associated with urban areas, but it appears that there may be an increasing number of people setting up permanent housing on U.S. public lands, such as national and state parks and forests. A seminal research project by Southard (1997) classified homeless or long-term users of public lands into three broad categories. First, "voluntary nomadic" homeless campers are those for whom "homeless" camping is a voluntary choice, or a preferred way of life. Voluntary nomadic campers believe they are pursuing an alternative lifestyle that rejects capitalist goals in favor of a more deeply spiritual life that focuses on connection to the earth and their fellow travelers. Second, "economic refugees" are homeless due to circumstances, not by choice. Economic refugees are individuals and families who are recently unemployed or who have been priced out of the local housing market and have become only recently homeless. Third, "separatists," like voluntary nomads, live a fairly stable lifestyle on public lands. Most commonly, members of this group are single, middle aged to older males living a solitary existence, preferring to stay away from other people. Separatists frequently have military backgrounds or are experienced campers and hunters. Veterans frequently fall into this category. They seek solitude in public lands and rely on receiving a modest military pension or disability benefits. Southard's categories of homeless users of public lands remain incomplete and in need of further refinement given that little research has been conducted focusing on

homeless campers on public lands outside of a later study that supported Southard's typology (Bottorff, Campi, Parcell, & Sbragia, 2012). Nevertheless, Southard's typology provides a reasonable, general idea of the kinds of homeless campers that can be found on U.S. public protected lands managed by the federal government.

The seriousness of homelessness and homeless user behaviors, which often involve illegal activities, on public lands becomes evident if one considers how many people could potentially be adversely impacted. Protected lands including national parks, national forests, national monuments, and wildlife refuges are popular destinations in North America and around the world. In 2017, 15 percent of the terrestrial world was in some protected area status, with protected areas in 245 countries, receiving 8 billion visits annually around the world (Balmford et al., 2015). Visitation to national parks in Japan amounted to approximately 333 million in 2012 (Jones & Ohsawa, 2016), similar to the number of annual visits to U.S. national parks which totaled over 330 million in 2017 nationwide (National Park Service, n.d.). In Europe, national parks located closer to urban centers are likelier to receive higher visitor numbers than remote areas (Schägner, Brander, Maes, Paracchini, & Hartje, 2016), a situation that has been observed in Taiwan (Lee, Huang, & Yeh, 2010), Brazil (Viveiros de Castro, Souza, & Thapa, 2015), and Finland. (Neuvonen, Pouta, Puustinen, & Sievänen, 2010). Proximity to urban locations makes such forests and public lands attractive to all types of users. Large numbers of visitors to recreation and tourism destinations create positive outcomes including area economic benefits (White, Bowker, Askew, Langner, Arnold, & English, 2016), but can also coincide with increased criminal activity (George, 2010) that negatively impacts visitor experiences and places downward pressure on visitation (Alleyne & Boxill, 2003). In the U.S., federally protected national forests have seen increases in varying forms of criminal activity that have impacted visitors, especially in urban-proximate forests (Chavez & Tynon, 2000). The types of criminal behavior occurring on U.S. national forest lands ranges from "mild" types of criminal behavior such as littering to more serious crimes, including violent offences and drug-related activity (Chavez, Tynon, & Knap, 2004). Around the world, agencies that manage protected lands are commonly responsible for enormous areas but have few resources to patrol and manage use (Fischer, 2008; Leverington, Costa, Pavese, Lisle, & Hockings, 2010).

In the U.S., the USFS is responsible for managing 154 national forests and 20 grasslands in 44 states of the U.S. covering more than 192 million acres (U.S. Forest Service, 2017). Camping sites on national forests vary in level of development and solitude, based upon the agency's Recreation Opportunity Spectrum (ROS) (Clark & Stankey, 1979). At the most undeveloped end of the spectrum, the USFS manages areas classified as 'primitive'. Primitive areas are the most remote and dispersed (farthest from roads and development) and therefore most challenging to access. Primitive camping areas commonly lack any amenities save for vault toilets occasionally and create maximum opportunities for solitude. Primitive sites are managed to be rustic and rudimentary. At the other end of the ROS, the USFS classifies areas as 'urban.' Camping sites in urban areas are managed for greater visitor convenience and comfort and may include amenities such as buildings, running water, and commercial activities. Camping areas in urban locations provide opportunities for extensive interaction with others and easy access and travel (U.S. Forest Service, 1982). Regardless of level of campsite development, all camping on USFS lands is subject to limitations on the length of time visitors may remain in a site.

Each national forest has specific rules about the maximum amount of time one can occupy a particular forest site; these are designated by a special 'order' as per the Code of Federal Regulations (36CFR.261.50), under "occupancy and use." Rules for camping are usually posted at the developed campgrounds and in visitor centers and ranger district offices. In some national forests, stay limitations are not specified, but most forests indicate a maximum stay of 14 days at a site. In recent years, longer stay limits have been allowed by special forest order. At

the conclusion of an allowable stay, campers are required to move to another site. When visitors exceed the maximum time allowable at a site, they are committing a “stay violation.” USFS law enforcement officers (LEOs) can issue a citation for violating this regulation, which typically includes a fine. As with most regulations, LEOs have some discretion in how these rules are applied or enforced and how much time is allowed for compliance. Some national forests have special orders in place associated with the handling of stay violations, which governs the response of law enforcement officials. The degree and severity of management challenges associated with homeless vary across regions, but overall, homeless occupancy of national forest lands remains a difficult situation. Some illegal behavior is more easily linked to homeless occupants, such as building permanent structures, erecting fences or enclosures, cultivating the land, or storing large equipment on Forest Service land (36 CFR.261.50).

Several studies have looked at criminal activity on national forest lands (Tynon & Chavez, 2006; Wing & Tynon, 2006) and offered suggestions on important research questions, including how illegal activity impacts recreation users. Researchers (Wing & Tynon, 2008) used GIS and crime data to identify crime hotspots in the Willamette National Forest in Oregon, identifying certain criminal acts that are most prevalent. Misdemeanors were most common, described as, among other activities, occupancy use and alcohol consumption. Additional information is not given on what precisely “occupancy use” means but this could relate to stay violations by homeless occupants. This is speculation only, given that others are certainly capable of exceeding stay limits as well. Sanitation was also mentioned as a type of misdemeanor, which also could be related to homeless encampments. Two studies (Wing & Tynon, 2006, 2008) relied on the USFS Law Enforcement and Investigation Attainment Reporting System (LEIMARS) as a source of criminal activity data. LEIMARS is the digital law enforcement reporting system used by the USFS to record law enforcement activity. These studies looked at the spatial distribution of categories of crimes (misdemeanors, felonies, infractions etc.) found in LEIMARS for USFS Region 6 (covering Oregon and Washington states). These studies have been helpful in understanding spatial distribution of criminal activity but reported outcomes did not convey a level of granularity that would permit identification of specific offenses (such as stay violations).

At the time of this writing, outside of a small number of studies (Bottorff et al., 2012; Southard, 1997), empirical research focused solely on the incidence and impacts of homelessness on USFS lands is absent. Yet, anecdotal information and recent media accounts (Healy, 2016; Petersen, 2016) suggest that homeless individuals on U.S. national forests present persistent management challenges and costs. Management challenges associated with homeless campers on USFS lands include maintaining adequate sanitation and public safety, addressing homeless impacts on natural resources, vandalism, garbage, and conflict with other forest visitors. This exploratory study can help identify the extent to which long-term occupancy by homeless individuals occurs in national forests and grasslands across the U.S. The research discussed in this article will help provide a better understanding of the types of homeless occupants encountered, and the social impacts associated with their presence.

We surveyed USFS LEOs and special agents nationwide, asking questions about the frequency and types of homeless encountered, the frequency of LEO responses to conflict with other forest users, and the types of unlawful activity LEOs responded to when encountering homeless individuals. In an effort to avoid using potentially biasing or inflammatory language, rather than refer to “homeless” in our questionnaire, we referred to them, instead, as “non-recreational campers” or NRCs. The terms NRCs and homeless will be used interchangeably throughout this article. We looked at differences in frequency of encounter and social impacts across different forest types we created for the study (i.e., forests near urban areas or urban-proximate, densely populated rural, or sparsely populated rural areas). Statistical comparisons across the different forest types were conducted.

## 2. Methods

A web-based questionnaire was distributed nationally to USFS LEOs with the support of the USFS Office of Law Enforcement and Investigation in Washington D.C. in the summer of 2015. We sent out an initial email announcing the survey, followed a week later by an email containing the weblink to the full questionnaire. Approximately one week later, we sent a reminder/thank you email, and then sent out two more emails containing the weblink to the questionnaire spaced about one week apart. At the time of the survey, there were 586 law enforcement officers and special agents in the USFS, and we received 290 completed surveys for a response rate of 49 percent.

We explored the presence of NRCs by asking respondents to indicate how often, on average, they encountered various types of NRCs on a 6-point Likert scale from 1 (*never*) to 6 (*more than once per week*) in their current jurisdiction. We developed the classes of NRCs based somewhat on extant scholarship and, to a larger extent, informal conversations with key informants. Though Southard (1997) typology is helpful, we felt our study required additional categories to better reflect the diversity of homeless persons found in national forests. Classes of NRCs in the study are:

- Separatists-asocial or solo individuals (often veterans or survivalist/separatist types);
- Families or single parents with children – these are family groups recently homeless who are seeking to find permanent housing as quickly as possible, the same or similar to Southard (1997) economic refugees;
- Rainbow Families – these are voluntary or intentional communities of adults and families living nomadic or semi-nomadic lives who meet regularly on national forest lands to celebrate and commune with each other;
- Forest workers – people employed in timber or other harvest professions (harvesters, growers, pickers, and loggers) living in the forest temporarily;
- Seasonal amenity or recreational workers – guides and ski instructors;
- Informal gatherings of homeless adults – these are ad hoc gatherings, unlike the Rainbow Family gatherings that are organized and repetitive;
- Transient retirees – retired individuals living in recreational vehicles either because they cannot afford a permanent home or have voluntarily adopted a nomadic lifestyle;
- University or college students living on forest lands;
- Groups of teens, gang members, undocumented workers or other marginal groups; and,
- Fugitives- individuals seeking to evade notice or capture by law enforcement.

We assessed how NRCs are impacting other people on USFS lands by inquiring how often, on average, LEOs were required to respond to situations of conflict between NRCs and others. Others on USFS lands included overnight recreational users, forest service staff and personnel, and private industry timber workers. For this question, we used a 5-point Likert scale from 1 (*never*) to 5 (*always*). Finally, we report here on outcomes looking at unlawful activity.

LEOs are responsible for responding to and investigating criminal behavior on USFS lands. The nature and frequency of criminal behaviors varies. LEOs respond to minor offenses such as expired vehicle registration and litter, to more serious offenses including DUI, assault, and murder. Common citations associated with NRCs are stay violations (exceeding allowed continuous time at a site, usually 14 consecutive days), drug- or alcohol-related offenses, and unsanitary camp conditions (litter, garbage, feces). Permit violations, such as hunting or harvesting timber without a license, are not often associated with homeless occupants. We asked survey respondents how often they cited

or arrested NRCs for various criminal offenses. This question is also on a five-point scale from “Never” to “Always.” Offenses range from violent crimes such as murder or rape, to minor offenses including stay violations.

To develop a better understanding of impacts of NRCs in different areas, we also asked respondents to characterize the location of their current assignment. Response categories were: a sparsely populated, rural remote area, described as a fairly isolated area, not close to any large cities or towns; a densely populated remote area described as an area that is located close to small towns or cities, farmlands, or ranchlands; an urban or urban proximate area described as an area located within 50 miles of a major metropolitan area; and we included an “Other” category that allowed respondents to describe their current location as they preferred. Respondents who selected the “Other” category most commonly described their jurisdiction in terms that were similar to the urban or urban-proximate area category, or as large areas containing all three categories. LEO respondents were also invited to provide any additional comments pertaining to study topics in an additional comments section at the end of the questionnaire. Some of their written comments are included in our Discussion section to help more fully describe study outcomes but a full qualitative analysis of written comments is not included here.

We compared NRC encounter frequency, unlawful activity, and conflicts with other forest users across the different types of areas using ANOVA tests in SPSS (Version 24). We conducted ANOVA tests, Levene tests for equality of variances, and finally post-hoc tests based upon the Levene test outcomes. In cases of non-equal variance, we used a Tamhane’s post-hoc test. In cases where a Levene’s test revealed equal variance, we employed a Bonferroni post-hoc test (Vaske, 2008).

### 3. Limitations

Limitations to consider in this study include the proxy measurement of homelessness and homeless activities and behaviors. Rather than collect data directly from NRCs, we relied on LEO reporting. Such a strategy provides an imperfect measure of NRCs on USFS forests and grasslands but represents a more readily available source of data.

Another limitation to be considered when interpreting study results relates to the categories of forest/grasslands. The forest categories we generated for the study are somewhat subjective. For example, we defined one class of forest as urban (or urban-proximate), lying within 50 miles of a city. While 50 miles away from the city may be urban-proximate on the east coast, in the west with its greater expanses of open land, 100 miles may be considered urban-proximate. Our categories were developed through discussions among the researchers and USFS key informants and as carefully crafted as possible but may introduce some level of bias in our results. Bias may be introduced through respondents’ subjective interpretation of categories, misunderstanding of category parameters, or in cases where a forest may contain multiple categories as we defined them. We could, for instance, have introduced a biased influence of urban/urban-proximate forests in our analysis. We included an “Other” category in our designation of different types of areas, a category that 22 respondents selected and for which they provided a description. Descriptions generally indicated an urban/urban-proximate location (e.g., “Less than 50 miles of major metropolitan area,” and “75% Urban area within 1–10 miles of a major metro city”) or some mixture of the categories we defined (e.g., “A mix of all of the above,” and “Full range listed above parts close to large metro and some remote rural”). Though these “Other” respondents represent a small proportion of the total (22/290), they do increase measurement error in our analyses. Bias may be introduced because we are unable to determine, in cases where a mixture of categories was reported, to which category of forest area NRC presence pertains exactly.

Our ANOVA testing of criminal activity among NRCs showed a significant difference among forest categories for drug possession, but

post-hoc testing did not indicate which categories significantly differed, an indication of lower statistical power in post hoc testing (Field, 2009). Even with its limitations, this study adds to our understanding of the complex management and public policy issue of homeless individuals on public lands, but by itself, a single study cannot fully explain the issue. It is only through the efforts of multiple investigators, researchers, and practitioners that an area of inquiry becomes clearer over time (Kaplan & Kaplan, 1982).

### 4. Results

Responses from this survey indicate that the presence of homelessness on USFS lands across the U.S. appears to be growing. Nationally, LEOs reported that numbers of NRCs are increasing (over 46% of respondents reported an increase) or remaining steady (about 30% of respondents). When asked about what factors, based on their interaction with NRCs, LEOs found to be associated with becoming homeless, respondents replied that mental health issues, drug/alcohol abuse, and job loss were most common among homeless on USFS lands. This outcome is consistent, in general, with research on homelessness in the U.S. (Fazel et al., 2014; Nooe & Patterson, 2010; Thompson et al., 2013).

According to LEOs across all different forest types, transient retirees are the most commonly encountered type of NRC. On average, transient retirees were encountered between a few times per year and once monthly (mean across all forest types = 2.82, on scale from 1 [*never*] to 6 [*more than once per week*]). Transient retirees were encountered once per month (mean = 3.00) in urban/urban-proximate forests, but this frequency did not differ significantly from number of encounters in sparse (mean = 2.57) or densely populated rural forests (mean = 2.61). LEO respondents reported encountering the category we described as teens/runaways the least, with an average of 1.59 (between 1 [*never*] and 6 [*more than once per week*]) across all forest types. Significant differences in number of encounters across forest types were reported for the categories of Separatists, Families with children, “Rainbow” family, Informal gatherings of adults, Teens/runaways, and Fugitives. In nearly all the categories of NRCs, LEOs in urban/urban-proximate forests reported the most frequent interactions (Table 1).

We also inquired with LEOs about the level of conflict that other forest users and visitors experience with NRCs (Table 2). We asked respondents, on average, how often they were required to respond to conflict between NRCs and other people on the forest. Across all forest types, LEOs reported having to respond to conflict between Forest Service staff and NRCs most often, between once per month and two to three times per month (mean = 3.11, on scale from 1 [*never*] to 6 [*more than once per week*]). Conflicts with overnight campers were reported second most frequently (mean = 3.00), and conflicts with private industry forest workers (mean = 1.94) were responded to the least by LEOs. Significant differences were found among the different forest types for the NRC categories of Day-use visitors and Concessionaires/vendors. As with frequency of encounters, LEO respondents in urban/urban-proximate forests reported significantly more responses to conflicts than LEO respondents working in forests near sparsely or densely populated rural areas.

Finally, we asked LEOs to report how often they were required to respond to various types of criminal activity (Table 3). Across all forest types, stay violations were most frequently reported by LEOs responding to this survey (mean = 3.94, on a scale from 1 [*never*] to 5 [*always*]). The second most common type of illegal activity LEOs responded to was drug possession (mean = 3.41), which is also the only category for which a significant difference between forest types was found ( $F(3, 234) = 3.10, p = .028$ ). Effect size ( $\eta^2 = 0.20$ ) suggests that the practical significance of the differences is small to typical. Post-hoc testing did not reveal which categories differed. Non-significant post-hoc tests can occur despite significant ANOVA testing given that they are different types of tests (Field, 2009). The ANOVA is an

**Table 1**  
Frequency of law enforcement officers' encounters with types of non-recreational campers by forest type.

Type of Non-recreational Camper	Frequency of Encounters by Type of Forest <sup>a,b,c</sup>								F-value	p-value <sup>d</sup>	Effect size <sup>e</sup>	
	SPRRA		DPRA		UPA		Other					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD				
Transient retirees/Rvers	2.57	1.40	2.61	1.42	3.00	1.45	3.10	1.45	1.90	0.131	0.15	2.82
Separatists	2.60	1.12	2.34 <sup>a</sup>	1.01	2.86 <sup>b</sup>	1.34	2.67	1.32	2.83	0.039	0.18	2.62
Families w children	2.14 <sup>a</sup>	0.97	2.35	1.15	2.64 <sup>b</sup>	1.23	2.71	1.31	2.69	0.047	0.18	2.46
Informal gatherings of adults	2.02 <sup>a</sup>	1.30	2.24 <sup>a</sup>	1.43	2.90 <sup>b</sup>	1.68	2.48	1.57	4.88	0.003	0.23	2.41
Fugitives	1.90 <sup>a</sup>	0.79	1.95 <sup>a</sup>	0.79	2.37 <sup>b</sup>	1.21	2.33	1.32	3.74	0.012	0.21	2.14
Seasonal recreation workers	1.98	1.26	1.85	1.17	2.07	1.34	2.24	0.87	0.66	0.579	0.09	2.04
Forest workers	2.10	1.18	1.88	1.05	2.01	1.21	1.76	0.77	0.69	0.560	0.09	1.94
Rainbow family	1.71 <sup>a</sup>	0.85	1.75 <sup>a</sup>	0.46	2.04 <sup>b</sup>	1.00	1.81	0.68	2.77	0.042	0.18	1.83
College students	1.58	1.07	1.55	0.87	1.91	1.35	1.60	1.20	1.79	0.151	0.15	1.66
Teens/runaways	1.34 <sup>a</sup>	0.59	1.47	0.79	1.84 <sup>b</sup>	1.16	1.71	1.23	3.94	0.009	0.21	1.59

<sup>a</sup> Frequency of encounter on scale, 1 (Never), 2 (A few times a year), 3 (About once a month), 4 (2–3 times a month), 5 (About once a week), 6 (More than once a week).  
<sup>b</sup> SPRRA – Sparsely populated remote rural area; DPRA – Densely populated remote area; UPA – urban proximate area.  
<sup>c</sup> Different superscripts denote categories with significant differences.  
<sup>d</sup> A value lower than 0.05 indicates statistically significant difference.  
<sup>e</sup> Effect size describes the practical significance of any differences. A value of 0.1 corresponds to a small difference. A value of 0.243 indicates a typical difference.

omnibus test looking at all comparisons simultaneously, while post-hoc tests conduct individual comparisons, requiring adjustment for compounded error. The adjustments decrease Type I error but increase the likelihood of Type II error (failing to reject the null hypothesis of no relationship, when it is false). LEOs reported responding the least to immigration violations (mean = 1.94). Responses to drug possession were reported more commonly in forests near urban areas, than the other forest categories.

**5. Discussion**

**5.1. Conflict and unlawful behavior**

We inquired how often LEOs are required to respond to conflict situations between NRCs and others present on the forest or grassland. Globally, outcomes of conflict among users in recreation and tourism areas (Pickering & Rossi, 2016; Zhang, Fyall, & Zheng, 2015) appears to be consistent with what research reveals in the United States. Conflict between NRCs and other forest users is an area of recreation conflict research that is less well documented.

We found that conflict situations with NRCs are observed a few times per month at their most frequent. Frequency of conflict was highest in urban/urban-proximate sites and was reported most often

with forest service staff, concessionaires/vendors, and day-use visitors. For most visitors, forest sites located closer to urban areas likely represent a more convenient visit option than sites located farther away (Walker & Crompton, 2012; Scott & Mowen, 2010). For the same reason, homeless individuals may tend to concentrate in urban/urban-proximate USFS sites. Thus, it stands to reason that others visiting or working in the forests and grasslands would come into conflict with NRCs more often in urban/urban-proximate sites given an apparent higher concentration of people at urban/urban-proximate locations.

We did not inquire about the nature or type of conflict LEOs respond to, so we cannot discuss how impactful conflict responses are on LEO workload. For example, conflicts may be generally minor, such as day-use visitors simply reporting to an LEO that NRCs were in the area and may have made recreational users uncomfortable. The conflict could have been a verbal dispute. Or, it could be that LEOs interpreted conflict to mean that they had to actively intervene in a physical altercation or other difficult situation with responses that might include escalation of force and arrest. Nevertheless, LEOs, especially those posted in urban/urban-proximate forests, are clearly spending time managing conflict between NRCs and others on the forest, which has implications for their availability to respond to other issues or attend to other duties. Exploring conflict created by the criminal (or, at least, deprecative) behavior of NRCs expands the discussion of conflict in recreation,

**Table 2**  
Frequency of law enforcement responses to conflict between non-recreational campers and other users by forest type.

Other User Type	Frequency of Conflicts by Type of Forest <sup>a,b,c</sup>								F-value	p-value <sup>d</sup>	Effect size <sup>e</sup>
	SPRRA		DPRA		UPA		Other				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
Forest Service Staff	2.98	1.00	3.04	0.86	3.27	0.92	3.15	0.81	1.45	0.228	0.13
Recreational overnight visitors	2.83	0.95	2.92	0.89	3.16	0.72	3.10	0.79	2.16	0.094	0.16
Day use visitors	2.77 <sup>a</sup>	0.95	2.84	0.85	3.16 <sup>b</sup>	0.71	3.05	0.76	3.41	0.018	0.20
Private property owners	2.58	0.96	2.83	0.92	3.01	0.93	2.90	1.02	2.22	0.086	0.16
Concessionaires/vendors	2.02 <sup>a</sup>	0.98	2.22	0.93	2.48 <sup>b</sup>	0.97	2.05	0.83	3.08	0.028	0.19
Non-timber forest product harvesters	2.09	1.02	2.12	0.89	2.14	0.97	1.85	0.75	0.55	0.652	0.08
Private industry forest workers	1.96	0.90	2.01	0.90	2.03	0.99	1.75	0.72	0.55	0.649	0.08

<sup>a</sup> Frequency of response to conflict on scale, 1 (Never), 2 (A few times a year), 3 (About once a month), 4 (2-3 times a month), 5 (About once a week), 6 (More than once a week).  
<sup>b</sup> SPRRA – Sparsely populated remote rural area; DPRA – Densely populated remote area; UPA – urban proximate area.  
<sup>c</sup> Different superscripts denote categories with significant differences.  
<sup>d</sup> A value lower than 0.05 indicates statistically significant difference.  
<sup>e</sup> Effect size describes the practical significance of any differences. A value of 0.1 corresponds to a small difference. A value of 0.243 indicates a typical difference. A value of 0.371 or higher indicates a large difference.

**Table 3**  
Comparison of non-recreational campers' illegal behavior frequency by forest type.

Type of Illegal Activity by Non-recreational Campers	Frequency of Illegal Activity in Types of Forests <sup>a,b,c</sup>								F-value	p-value <sup>d</sup>	Effect size <sup>e</sup>
	SPRRA		DPRA		UPA		Other				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
Stay violation	3.87	0.92	3.82	0.92	3.99	0.85	4.11	0.79	0.84	0.474	0.10
Drug possession <sup>f</sup>	3.11	1.10	3.50	0.80	3.56	0.70	3.47	1.02	3.10	0.028	0.20
Unlicensed use of a motor vehicle	3.13	0.99	3.19	0.97	3.30	0.89	3.05	1.13	0.56	0.642	0.09
Public intoxication	2.63	1.08	2.99	0.91	3.10	0.92	3.05	1.22	2.45	0.064	0.18
Drug trade/distribution	2.57	1.00	2.95	0.95	2.95	0.91	2.79	0.79	2.06	0.106	0.16
Drug production/growing	2.57	1.05	2.95	0.95	2.95	0.91	2.79	0.79	0.28	0.843	0.06
Vandalism/damage to public property	2.63	1.06	2.95	0.86	2.95	1.04	2.68	0.82	1.54	0.206	0.14
Petty theft	2.57	1.05	2.66	0.93	2.62	1.04	2.63	0.90	0.10	0.963	0.04
Violent crime (e.g. murder, rape)	2.43	0.89	2.46	0.80	2.64	0.80	2.84	0.69	1.81	0.146	0.15
Illegal possession of a firearm	2.59	0.98	2.47	0.93	2.53	0.91	2.58	1.02	0.18	0.908	0.05
Panhandling	2.57	1.07	2.53	0.99	2.77	1.09	2.26	0.99	1.62	0.186	0.14
Permit violation	2.52	1.03	2.59	1.03	2.49	1.27	2.16	1.07	0.77	0.510	0.10
DUI	2.28	0.91	2.49	0.85	2.53	0.87	2.37	1.07	0.88	0.451	0.11
Vandalism/damage to private property	2.22	0.92	2.47	0.93	2.42	1.02	2.11	0.81	1.23	0.300	0.13
Poaching	2.05	0.91	2.22	0.84	2.09	0.85	2.16	0.83	0.48	0.696	0.08
Grand theft	2.13	0.83	2.12	0.85	2.12	0.88	2.05	0.71	0.04	0.989	0.02
Immigration violation	1.87	0.89	2.01	0.99	2.03	1.09	1.84	0.83	0.42	0.739	0.07

<sup>a</sup> Frequency of encounter on scale, 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Quite often), 5 (Always).  
<sup>b</sup> SPRRA – Sparsely populated remote rural area; DPRA – Densely populated remote area; UPA – urban proximate area.  
<sup>c</sup> Different superscripts denote categories with significant differences.  
<sup>d</sup> A value lower than 0.05 indicates statistically significant difference.  
<sup>e</sup> Effect size describes the practical significance of any differences. A value of 0.1 corresponds to a small difference. A value of 0.243 indicates a typical difference. A value of 0.371 or higher indicates a large difference.  
<sup>f</sup> Though a significant F-value was found, post-hoc tests failed to indicate which categories differed significantly.

leisure, and tourism settings. Impacts of criminal activities on recreation seekers have been explored in the U.S. (Chavez et al., 2004) as well as other countries including Ghana (Adam & Adongo, 2016) and South Africa (George, 2010).

On national forest lands in the U.S., the kinds of unlawful activities LEOs report responding to in connection with NRCs vary little among different forest types, in general. Stay violations were reported as occurring most often. As noted, there are homeless individuals who would opt to set up long term temporary shelter on public lands rather than stay in city shelters. Conversations with key informants revealed that, for some NRCs, such as the transient retirees, moving among USFS sites throughout the year is common, as weather patterns change. As a result, much of the time LEOs spend interacting with NRCs involves LEOs directing homeless campers to vacate a site. Key informant conversations with LEOs indicated that when asked to vacate a site, some NRCs will move to a nearby site and re-establish a new encampment. One respondent to our questionnaire echoed this sentiment when s/he wrote in the additional comments section, “Most of the summer and winter it seems to [be] a chess game of moving ... from one area of the forest to another.” In some remote sites, NRCs can easily hide and evade further contact given the vast territories LEOs patrol. In some cases, LEOs physically transport NRCs outside the national forest boundary, but more often, LEOs notify individuals at an NRC encampment that they have exceeded their stay limit and ask them to leave. The officer will return on a future day to see whether the NRC party has complied.

Drug possession was reported as the second most commonly encountered form of illegal activity among NRCs. This result is consistent with data that point to the high prevalence of substance abuse among homeless populations (Kim et al., 2010; Padgett et al., 2011). USFS LEOs reported that they often refer people to counseling and drug intervention services. One survey respondent wrote, “About half do not want help, won't accept it – drugs, alcohol and mental health issues are pervasive.” NRCs struggling with mental health and addiction issues present a particularly difficult challenge for LEOs who may not have specific training in addiction intervention or who may not have ready access to treatment networks. This may especially true in remote, rural forests. LEOs are highly trained professionals who serve the public and

protect natural resources, but they may not all have extensive training in mental health services, which could affect their ability to respond to those experiencing substance abuse or mental health challenges, (Markowitz, 2011). One respondent wrote, “There exists a real need for officers to train to interact with these individuals many of whom may be suffering from mental illness.”

LEOs reported that unlicensed use of a motor vehicles was fairly common among NRCs. This finding is consistent with verbal comments made by key informants we spoke with to prepare for this survey who stated that homeless individuals on national forests often use their vehicles for shelter and, in many cases, the registration on the vehicles has expired. While we anticipated that drug possession would be reported more frequently than many other violations in connection with homeless campers, we had not expected drug trade and distribution to be reported in conjunction with NRCs as frequently as it was. The literature about crime on national forest lands does not give an impression of a connection between NRCs and drug production (Chavez et al., 2004; Tynon & Chavez, 2006; Wing & Tynon, 2006), so we would have expected such activities to be rarer than reported.

We were also not expecting violent crime to be as frequent as it appears in our outcomes either. Crime perpetrated by homeless individuals has been found to be largely of a non-violent nature when severe mental illness is not involved (Fischer, Shinn, Shrout, & Tsemberis, 2008). Unfortunately, when asking about NRC conflict, we did not inquire as to victims' status (other NRC or recreational visitors), but this would be useful information to gather in a future project to help manage conflict, crime, and concerns among other forest users. Results for petty theft and vandalism to public property appear consistent with anecdotal evidence of NRCs taking items from unattended campsites (e.g., bicycles, coolers, and camp equipment) and removing materials from fixed structures to use in shelters or other construction. Key informant conversations revealed that NRCs have been known to remove wood and other building materials from USFS structures to burn as firewood or to construct personal shelters or fences.

One unexpected outcome our data revealed was that panhandling was reported to occur slightly less than illegal possession of a firearm, an outcome we would not have predicted. In fact, panhandling falls

below several other crimes we would have anticipated to occur less frequently, such as drug production and violent crime. Given that panhandling seems to be a common strategy to procure resources for a homeless person, at least in urban areas, we anticipated a higher prevalence in our study. Petty theft was reported as occurring more often than panhandling, so it may be that NRCs are relying less on asking for handouts and more on taking what they need. It is equally plausible that many homeless campers on USFS lands are able to obtain help from social services, thus reducing their reliance on panhandling.

The least common types of criminal behavior were poaching of fish or game, grand theft, and immigration violations. The poaching item was presented in the questionnaire as illegal hunting or fishing (poaching used in the Table 3 for simplicity). The higher prevalence of illegal possession of a firearm and the low incidence of hunting related crimes may indicate that possession of firearms is largely for protection, rather than hunting. This interpretation depends somewhat on types of firearms possessed, hand guns or rifles. Hand guns would likely be more useful as personal protection and less useful for hunting. However, we did not inquire to that level of detail.

Grand theft, defined in the state of California (monetary thresholds between petty and grand theft vary across different states) as theft of items valued at over \$950 (State of California, n.d.), occurred infrequently as well. It is not clear whether NRCs are purposefully restricting theft to less expensive items or there is an absence of expensive items at camp sites. These uncommon types of crime are less telling than the most common occurrences of drug possession and public intoxication. The prevalence of substance abuse and addiction-related crime is strongly in line with the literature on the prevalence of homeless individuals facing challenges with substance abuse and mental illness. Additional, specialized training to manage NRCs with mental health and/or addiction challenges will probably require additional support but may be important in response to a continuing presence and likely increases in NRCs in U.S. national forests.

## 6. USFS resource limitations

In addition to providing diverse recreation opportunities to visitors and maintaining the health of ecosystems, the USFS has needed to shift finite resources towards addressing impacts of long-term forest occupants and to provide services to homeless campers seeking help. The agency currently faces constraints in budgetary and personnel capacity and pressing needs for maintenance of infrastructure and facilities (Davenport, Anderson, Leahy, & Jakes, 2007; More, 2002). As one respondent commented in the additional comments section of the questionnaire,

“This issue is becoming more problematic and more burdensome on a program that is already stretched extremely thin. The majority of these non-recreational campers bring alcohol abuse, drug abuse and general lack of compliance problems with them to the [National] Forests.”

Another LEO wrote,

“Land management agencies are not social service agencies. While we are compassionate, we do not have the resources or abilities to solve the person/family issues. We focus on the environmental protections and negative impacts to public safety and recreationists.”

One LEO explained,

“Like many programs, District Rangers and Forest Supervisors have administrative issues that they are overwhelmed with. Most have a hard-enough time having the resources to clean toilets and meet minimum standards on the district, let alone deal with long term non-recreational transients.”

Still another LEO wrote that, “It’s a continual problem that we

address each incident on a case by case basis to find the best solution. It’s tough and it seems to never end.” For land management agencies to meaningfully address challenges arising from homelessness on public lands, additional resources, including more empirical data and in-depth research (including interviews with NRCs and LEOs), would be helpful. Homelessness remains a stubborn social and economic challenge in the U.S. Public agencies and private organizations located mostly in cities are available to help people living on urban streets, but homeless individuals and families sometimes opt to relocate to public lands outside settled areas.

LEO reports of increased encounters with NRCs in urban/urban-proximate forest and grasslands may result from a need among many homeless individuals to be nearer to social or medical services, veterans’ agencies, employment opportunities, retail or postal services, and public transportation located in urban areas. One survey respondent wrote in the additional comments section, “Highest density of transient/homeless camps occur close to town where food, services, alcohol, drugs, etc. are available. The further I get from town, the less transient camps...” It may also be that U.S. national forests close to cities present a more easily accessed alternative for homeless individuals reluctant to stay in a shelter. Homeless people may choose to stay on public lands rather than feel unsafe in a shelter or face the prospect of parting with an animal companion. Urban/urban-proximate forests may also act as a kind of “overflow” for cities in which public services cannot adequately provide responses to large numbers of homeless residents. Perhaps encounters with NRCs in urban/urban-proximate locations are more frequent because, unlike remote locations, it is harder for NRCs to avoid contact with LEOs. The reasons underlying the apparent greater prevalence of homeless campers in urban/urban-proximate forest/grassland areas are currently unclear and require further investigation.

Nearly half of the respondents to our survey reported that the presence of NRCs in their jurisdiction is increasing, which suggests that the USFS, and other public land management agencies in the U.S., may find that the persistent challenge may require additional resources and attention. An LEO wrote in the additional comments section of the questionnaire, “Being the only forest officer in the [area], I do not have the time or resources to patrol this area every day and keep track of every transient living/working in the area. It’s a nightmare.” Resources directed towards impacts of homeless campers might compete with other pressing needs related to resource protection and visitor safety, such as wildland fire management. Where in years past, the USFS needed to concern itself with primarily natural resources and recreational visitor management, increasingly, the agency is being drawn into responding to homelessness, mental illness, and addiction. Tangible and manageable solutions that will directly address the challenges of homelessness on USFS lands can be developed by using empirical data such as that found in this study, to help inform management discussions.

## 7. Possible responses to NRCs on USFS lands

Whatever the causes, the frequency of LEO encounters with the homeless (especially in urban/urban-proximate forests) suggests that line officers and LEOs need a variety of management responses to address persistent homeless habitation. Among possible strategies, the USFS and other natural resource agencies could explore new partnerships or expand relationships with local organizations serving the homeless such as non-profits, faith-based organizations, and city agencies. For instance, veterans constitute a substantial proportion of the homeless population in the U.S. (Tsai, Link, Rosenheck, & Pietrzak, 2016), such that they may constitute a growing percentage of inhabitants on public lands. Reaching out to private and public veterans’ organizations may be beneficial to expand the array of strategic options. Organizations that serve senior citizens may also be valuable partners to USFS staff. Our data revealed that “transient retirees” were

most often encountered by LEOs on national forests and grasslands suggesting that learning more about how to best work with seniors could benefit LEOs and the USFS.

Transient retirees, generally, are older Americans on a fixed income who do not maintain a permanent home and who may be seasonally nomadic. Older homeless individuals have fewer employment options than other types of NRCs and may continue to be a persistent presence on public lands, presenting unique management challenges for forest staff (Kimbler, DeWees, & Harris, 2017). Older homeless individuals often require a greater number of medical services than younger adults (Brown et al., 2017). As the population in North America ages amidst an environment of persistent economic and housing challenges (Crane & Warnes, 2010; Culhane, Metraux, Byrne, Stino, & Bainbridge, 2013), we anticipate that this category of NRCs will remain stable or increase. Transient retiree NRCs were most commonly encountered in urban/urban-proximate forests, perhaps due to a need to be closer to medical care and other social services. Forest supervisors in urban/urban-proximate locations might consider augmenting training and resources to respond to the unique medical challenges of older homeless adults.

In contrast, teens/runaways were least often encountered by LEOs, but, like their older counterparts, were also encountered most commonly in urban/urban-proximate forests. Homeless teens/runaways are a particularly vulnerable group for whom sexual exploitation, substance abuse, pregnancy, and mental health issues are common (Morewitz, 2016). Homeless teens and young adults may be more susceptible to partner violence (Petering, Rhoades, Rice, & Yoshioka-Maxwell, 2017) and likely to engage in illegal behaviors including panhandling, drug sales, and theft (Ferguson, Bender, & Thompson, 2016; Ferguson, Helderop, Bender, & Grubestic, 2016) that could negatively impact other forest users in urban proximate forest sites. The USFS might consider benefits of partnering with agencies that work with teens and runaways to find permanent housing solutions for teens and runaways residing on USFS lands. LEOs know, at least roughly, the locations of teenaged NRCs, and could work with social agencies and non-profits to locate and reach out to teens and runaways in urgent need of help.

We want to caution that our results are the result of a single study. No one study, no matter its sophistication or breadth, can adequately explain a complex phenomenon like homelessness on public lands. Before any policies or management strategies are considered, additional in-depth study is needed. Our study did not attempt to enumerate populations of NRCs on public lands, but it will be important to develop a reasonable estimate of how many people a forest or district has living on USFS lands and how much such populations fluctuate throughout the year. Additional study will help by identifying who (members of what group) are committing what illegal acts, and who are the victims of NRCs' criminal behavior. Further, forest planners and managers will benefit by knowing more about any seasonal patterns that might exist which influence when additional services are needed.

## 8. Conclusion

Homelessness will likely continue to present substantial challenges to U.S. public and private organizations (Lee et al., 2010) in an environment in which support services for the homeless are unpredictable (Bussewitz, 2016). There is little reason to believe that the USFS can expect fewer homeless residents on national forest lands for the time being. On the contrary, our respondents reported that the presence of NRCs on USFS lands appears to be increasing or remaining steady. As a result, LEOs, and other USFS staff, will be required to continue managing the effects of long-term occupants of their lands.

The apparent growing presence of NRCs on USFS lands constitutes an unanticipated burden on scarce agency resources. In the absence of additional resources and research directed at NRCs' impacts on natural and social components of U.S. public lands, management strategies are likely to remain ad hoc and incomplete. As one respondent noted, "Unfortunately homelessness is a complex issue, and does not lend itself

to easy answers. Forest management quite often do not have an understanding of the socio-economic complexities at play, or the frequency of psychological or mental health issues and [f]requent dependency or addiction issues plaguing the homeless." USFS LEOs are having to devote more of their time responding to situations involving NRCs, while remaining responsible for visitor wellbeing and ecological health in patrol areas commonly exceeding one hundred thousand acres. We suggest that a comprehensive, national strategy that fully incorporates participant research, could contribute to resource allocation decisions to successfully manage the persistent challenge of homeless campers on USFS lands.

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