U.S. Department of Justice
National Drug Intelligence Center

Product No. 2007-L0848-001

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Domestic Cannabis Cultivation Assessment 2007

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Assessment

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Purpose

The *Domestic Cannabis Cultivation Assessment 2007* is a national-level strategic assessment of cannabis cultivation and marijuana production in the United States. This assessment addresses major trends in domestic cannabis cultivation, both indoor and outdoor, with a focus on cannabis cultivation operations in primary areas of production at the state and county levels. This assessment addresses wide-ranging issues regarding cultivation operations, including planting and harvesting seasons; use or presence of weapons, booby traps, and counter-surveillance; resultant environmental damage; and the operational trends of drug trafficking organizations and other criminal groups. This assessment draws upon reporting and data provided by the Office of National Drug Control Policy, the National Marijuana Initiative (see text box on page 2), and numerous federal, state, and local law enforcement agencies.

Key Judgments

- Domestic cannabis cultivation has increased sharply since 2000 as more drug trafficking organizations (DTOs) relocate cannabis cultivation operations from Mexico and Canada to the United States. These DTOs are relocating to reduce the risk of marijuana seizure or loss during cross-border transport, gain direct access to local drug markets, and achieve higher profit margins for domestically produced marijuana, particularly higher-grade marijuana.
- Domestic outdoor cannabis cultivation by Mexican DTOs is most prevalent in remote and isolated areas of U.S. public and private lands, primarily in California, Oregon, and Washington.
- Mexican DTOs are expanding cannabis cultivation operations eastward, including into some areas east of the Mississippi River, such as North Carolina and Tennessee, in order to increase their role in domestic marijuana distribution and to be closer to eastern drug markets.
- Many Mexican criminal groups that have established grow sites in new areas of the country maintain direct contact and affiliation with larger DTOs in California and Mexico and maintain a level of coordination among operating areas, moving labor and materials to the various sites—even across the country—as needed.
- Indoor domestic cannabis cultivation is increasing as criminal groups attempt to avoid intensified outdoor eradication, reduce their risk of detection, and produce higher potency marijuana to increase their profits.
- Caucasian criminal groups are the predominant indoor producers of marijuana in the country; they are particularly active in the Appalachian Region.
- Domestic cannabis cultivation by Asian DTOs at indoor locations is increasing, a particular concern because many are well-organized, Canada-based groups that produce and distribute high potency marijuana.

National Marijuana Initiative

The National Marijuana Initiative (NMI), funded by the Office of National Drug Control Policy (ONDCP), was established in 2001 to coordinate federal, state, and local agencies in areas that produce the largest amounts of marijuana in order to significantly reduce cannabis cultivation. The Initiative is specifically intended to foster partnerships among agencies in states where DTO operations impact federal lands. The NMI is designed to assist in the investigations of DTOs operating in the seven primary cannabis cultivation and marijuana production states (often referred to as the M7 states): California, Hawaii, Kentucky, Oregon, Tennessee, Washington, and West Virginia. The NMI supports law enforcement efforts in identifying the infrastructure of marijuana DTOs through expanded investigations and collection of intelligence in an attempt to disrupt and eventually dismantle the organizations.

- Violent incidents by outdoor cannabis growers against law enforcement and the presence of weapons at outdoor grow sites are increasing, most likely because of increased law enforcement pressure and eradication.
- Rising law enforcement pressure—although clearly a concern to cultivators as evidenced by increasing violence and weapons—has not yet stemmed the increase in domestic cannabis cultivation, either outdoors or indoors. Rather, DTOs are simply adapting their methods (relocating to new areas, changing their growing cycles, and growing higher potency plants both indoors and outdoors) in order to continue operating in the United States while maintaining their profits.

Overview

Following September 11 and the resultant increased border security, law enforcement reporting indicates that DTOs—primarily Mexican but also Canada-based Asian DTOs (see Table 1 on page 3)—had moved many of their cannabis cultivation operations into the United States in an attempt to reduce the risk of marijuana seizure during cross-border transport. Since then, however, DTOs have recognized additional benefits of domestic cannabis cultivation, such as direct access to local drug markets, which enable them to be more responsive to market demands, and higher profit margins for domestically grown marijuana. These factors have contributed to a continued increase in domestic cannabis cultivation, an assertion seemingly supported by an overall increase in detection and eradication of outdoor cannabis during that time period (see Table 2 on page 3). Recent increases in domestic cannabis cultivation have been accompanied by improved cultivation techniques that produce higher potency marijuana, a practice that, if more widely used by DTOs, could significantly increase the prevalence of higher potency marijuana in the United States.

Primary Cannabis Cultivation Areas

According to national marijuana eradication data and law enforcement reporting, there are two primary outdoor cultivation regions in the United States: the Western Region, composed of California, Hawaii, Oregon, and Washington, and the Appalachian Region, composed of Kentucky, Tennessee, and West Virginia. Eradication data for 2006 show that 89 percent (5,262,065 of 5,901,880) of outdoor plants eradicated in the United States were eradicated in these seven states (see Table 3 on page 4, and Map 1 in Appendix B). These states consistently sustain high levels of outdoor cannabis cultivation because their climates are conducive to cannabis cultivation. As a result, cultivators—especially Mexican DTOs in the Western Region and Caucasian independent growers in the Appalachian Region—have

Table 1. Primary Cultivators in Leading Cannabis-Growing Areas

Region	State	Outdoor	Indoor
Appalachian Region	Kentucky	Caucasian DTOs, criminal groups, and independent growers	Caucasian independent growers
	Tennessee	Caucasian DTOs, criminal groups, and independent growers	Caucasian independent growers
	West Virginia	Caucasian DTOs, criminal groups, and independent growers	Caucasian independent growers
Western Region	California	Mexican DTOs and criminal groups	Asian and Caucasian DTOs and criminal groups
	Hawaii	Polynesian DTOs, Asian and Caucasian criminal groups	Asian and Caucasian groups
	Oregon	Mexican DTOs and criminal groups	Asian and Caucasian DTOs and criminal groups
	Washington	Mexican DTOs and criminal groups	Asian and Caucasian DTOs and criminal groups
Other Areas of Interest	Alabama	Caucasian criminal groups and independent growers	NA
	Arizona	Mexican DTOs and criminal groups	NA
	Florida	NA	Caucasian and Cuban DTOs and criminal groups
	Georgia	Caucasian criminal groups and independent growers	NA
	North Carolina	Caucasian DTOs, criminal groups, and independent growers	NA

NA–not applicable

Table 2. Domestic Cannabis Eradication, Outdoor and Indoor Plant Seizures, 2000–2006

	2000	2001	2002	2003	2004	2005	2006
Outdoor	2,597,798	3,068,632	3,128,800	3,427,923	2,996,225	3,938,151	4,083,433
Indoor	217,105	236,128	213,040	223,183	203,896	270,935	403,322
Total	**2,814,903**	**3,304,760**	**3,341,840**	**3,651,106**	**3,200,121**	**4,209,086**	**4,486,755**

Source: Domestic Cannabis Eradication/Suppression Program.

established long-standing, entrenched growing operations. Other areas of increasing significance with regard to cannabis cultivation include Alabama, Arizona, Georgia, and North Carolina; these areas have recently experienced significant increases in outdoor cultivation.

Table 3. Outdoor Cannabis Plants Eradicated in Primary Outdoor Production States 2005–2006

State	2005	2006	Percent of Change
California	2,914,193	3,674,069	+26.1
Kentucky	734,351	557,628	-24.1
Tennessee	462,904	483,231	+4.4
Hawaii	251,163	188,742	-24.9
Oregon	84,493	187,548	+122.0
Washington	137,319	115,459	-15.9
West Virginia	56,758	55,388	-2.4
Seven-State Total	**4,641,181**	**5,262,065**	**+13.4**
National Total	**5,546,509**	**5,901,880**	**+6.4**

Source: Domestic Cannabis Eradication/Suppression program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

Indoor cannabis cultivation appears to be most pervasive in western states, primarily in California and Washington (see Table 4, and Map 2 in Appendix B). Eradication data for 2006 indicate that 61 percent (246,975 of 403,322) of indoor plants eradicated nationally were eradicated in California and Washington alone. Cannabis is cultivated by a variety of growers, including Caucasian criminal groups and independent dealers; however, cultivation by Canada-based Asian DTOs is increasing significantly.

Law enforcement reporting indicates exceptionally high levels of cannabis cultivation (indoor and outdoor combined) in California, Kentucky, Tennessee, Hawaii, Oregon, Washington, and West Virginia. Total cannabis eradication suggests that these seven states constitute the most significant cannabis cultivation states overall (see Table 5, and Map 3 in Appendix B).

Table 4. Indoor Cannabis Plants Eradicated in Primary Indoor Production States 2005–2006

State	2005	2006	Percent of Change
California	107,047	203,559	+90.2
Washington	32,936	43,416	+31.8
Florida	45,217	36,172	-20.0
Hawaii	3,950	12,358	+212.9
New Hampshire	304	11,085	+3,546.4
Five-State Total	**189,454**	**306,590**	**+61.8**
National Total	**270,935**	**403,322**	**+48.9**

Source: Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

Table 5. Total Cannabis Plants Eradicated in Primary Production States, 2005–2006

State	2005	2006	Percent of Change
California	3,021,240	3,877,628	+28.3
Kentucky	736,991	558,756	-24.2
Tennessee	463,557	483,342	+4.3
Hawaii	255,113	201,100	-21.2
Oregon	91,829	194,453	+111.8
Washington	170,255	158,875	-6.7
West Virginia	57,600	57,582	0.0
Seven-State Total	**4,796,585**	**5,531,736**	**+15.3**
National Total	**5,817,444**	**6,305,202**	**+8.4**

Source: Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

Cannabis Cultivation Trends

Outdoor Cultivation

Some Mexican DTOs are shifting cannabis cultivation away from intense eradication areas—even into eastern states—a shift that may enable these DTOs to further increase domestic cannabis cultivation. Mexican DTOs are relocating some of their operations to locations north and east of their principal operating areas in California, seemingly to avoid improved aerial detection and eradication in the state. This move will enable them to increase cultivation in remote areas that have never been cultivated. In 1999 Mexican DTOs began relocating some of their operations from northern California into Oregon, Washington, and central Idaho. In 2003 Mexican DTOs established more cannabis grow sites in Idaho and in areas east of the Mississippi River, such as remote areas of Arkansas and Georgia. Recently, these groups have established outdoor grow sites in other areas of Arizona and in western North Carolina and eastern Tennessee. Mexican cannabis growers operating large-scale grows east of the Mississippi River are increasingly being linked to Mexican DTOs operating in California and Mexico, suggesting a coordinated effort with respect to domestic cannabis cultivation by Mexican DTOs that now spans the United States. Many of these groups maintain direct contact and affiliation with larger DTOs in California and Mexico and maintain a level of coordination among operating areas, moving labor and materials to the various sites—even across the country—as needed.

Mexican DTOs' extensive use of public lands for cannabis cultivation is increasing, even in areas that generally are not considered conducive to planting and growing cannabis. Mexican DTOs commonly grow cannabis in remote areas of public lands, where there is limited law enforcement presence. The occurrence of cannabis cultivation on public lands has increased significantly over the past several years, largely the result of increased domestic cultivation operations by Mexican DTOs. In 2005 cannabis cultivation on National Forest System (NFS) lands nationwide rose sharply, reaching the highest levels ever observed by law enforcement—a 49.6 percent increase from 744,276 plants eradicated in 2004 to 1,113,446 plants in 2005. This trend continued in 2006 as eradication rose an additional 26 percent between 2005 and 2006 (1,403,023). More cannabis plants were eradicated in national forests in California than in any other state nationwide in 2006 (1,133,563, or 81 percent of total NFS eradications), with

Cannabis Cultivation in Arizona: An Increasing Concern

Elevated cannabis cultivation and eradication totals in Arizona in 2005 were somewhat surprising to some law enforcement officials because of the large amounts of Mexican marijuana available within the state. According to the Drug Enforcement Administration (DEA) and the Arizona High Intensity Drug Trafficking Area (HIDTA), law enforcement authorities are continuing to see an influx of cannabis cultivation operations in the state. In 2005 law enforcement authorities seized 115,215 plants from seven sites in the Coconino and Tonto Forests, according to NFS data. As of November 30, 2006, approximately 21 cannabis cultivation operations and a total of 72,549 plants were eradicated from Arizona national forests. Moreover, according to the U.S. Department of Agriculture (USDA) Forest Service, approximately 12 of these sites were tended by Mexican foreign nationals. Despite the apparent decline in the number of plants seized between 2005 and 2006, the number of sites eradicated increased, and the area in which operations were eradicated expanded to cover three national forests (see Maps 4 and 5 in Appendix B). NFS data indicate that in 2006, 21 cultivation sites were eradicated in national forests in Arizona: 17 in Tonto, 2 in Prescott, and 2 in Coconino.

most plants eradicated within the mountainous areas of Mendocino National Forest of northern California (405,399), followed by San Bernardino National Forest (157,994). NFS also reports significant cannabis eradication in national forests beyond California, specifically in Daniel Boone National Forest in Kentucky (148,828); and in Tonto National Forest in Arizona (65,947). No Mexican DTO activity has been reported in Kentucky (see Table 6, and Map 6 in Appendix B).

Following consecutive annual record-level eradication since 2004, some cultivators who previously limited their operations to areas with optimal weather, elevation, and slope characteristics have relocated to areas where growing conditions are less conducive to cannabis cultivation. For example, Department of the Interior (DOI) officials report that some cultivators are relocating from coastal areas that are well-suited for growing to California's inland foothills and more arid areas, planting under low-cover brush such as chaparral. Cultivators are also relocating to other nonconducive growing areas outside of California, including eastern Oregon, eastern Washington, eastern Idaho, and the western slope of the Rocky Mountains. Despite relocating to nontraditional growing areas, cultivators must maintain access to a water source. For instance, law enforcement reporting from San Bernardino County, California, indicates that a several-thousand-plant grow was found covering nearly 2 square miles after officials responded to a wildfire in Little Morongo Canyon. Although this area is particularly arid, the grow site was within a mile of a natural spring. Law enforcement officials expect that grow sites will continue to be established by cultivators at remote sites in nontypical growing areas as eradication efforts continue in traditional growing areas.

Table 6. Top 10 National Forests for Eradication of Cannabis Plants on National Forest System Lands, 2006

National Forest	State	Total Plants Eradicated
1. Mendocino	California	405,399
2. San Bernardino	California	157,994
3. Daniel Boone	Kentucky	148,828
4. Shasta-Trinity	California	118,797
5. Sequoia	California	89,585
6. Los Padres	California	80,796
7. Tonto	Arizona	65,947
8. Stanislaus	California	65,072
9. Sierra	California	60,866
10. Plumas	California	55,673

Source: U.S. Department of Agriculture Forest Service.

Mexican DTOs in California are producing higher potency marijuana from cannabis cultivated in some large outdoor grow sites, the result of improved cultivation techniques. In 2006 law enforcement reporting from several agencies revealed that some Mexican DTOs that had previously produced marijuana with average THC (delta-9-tetrahydrocannabinol) levels of 2 or 3 percent from outdoor cultivated cannabis began achieving 8 to 12 percent THC levels by applying growing methods typically used by indoor growers of high potency cannabis. These DTOs typically use only select seeds from Mexico, prepare the seedlings in greenhouses, plant the seedlings outdoors before late April, separate male from female plants prior to pollination, and use high-nitrogen fertilizer. Moreover, these DTOs are increasingly using cloned starter plants (see text box), irrigation systems composed of black polyethylene (also known as PVC) drip lines extending to each plant, and pesticides. The higher potency marijuana produced from outdoor plants in California often is comparable in quality to

U.S. Public Lands

U.S. Department of the Interior

The DOI is the primary conservation agency in the United States and manages 525 million acres of land (23 percent of the land in the country), including 523 miles along the 3,987-mile U.S.–Canada border and 782 miles along the 1,952-mile U.S.–Mexico border. The DOI comprises five bureaus with law enforcement authority—the Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), Bureau of Indian Affairs (BIA), and Bureau of Reclamation (BOR). Indian reservations are federal lands held in trust for the Indian Nations.

U.S. Department of Agriculture National Forest System

National Forest System lands, managed by the U.S. Department of Agriculture Forest Service, consist of 191.6 million acres of federally owned reserves composed of 155 national forests and 22 national grasslands in 42 states and Puerto Rico. NFS lands adjoin approximately 700 miles of the U.S.–Canada border and nearly 60 miles of the U.S.–Mexico border.

Cloned Starter Plants

Cloned starter plants enable cannabis cultivators to select higher quality plants and avoid male/female pollination, thereby raising potential THC content. Cloning a cannabis plant is accomplished by simply taking a cutting of a select plant, allowing the cutting to sprout roots, and then planting it as a seedling, thereby creating a plant of the same genetic makeup as the parent plant. The use of clones also ensures that the plants will be well-established with a root system when planted, thereby increasing the chance of a successful maturation process. Cloned starter plants are increasingly being grown in California and Oregon and, to a lesser extent, in Appalachian states, including Kentucky and Tennessee.

Canada-produced BC Bud[1] and commands twice the price of commercial-grade Mexican marijuana available in the region. Although data regarding the number of eradicated, higher potency outdoor grow sites are not available, this practice still appears to be limited but is likely to increase as other Mexican DTOs and U.S. Caucasian cannabis growers adopt these methods.

Outdoor cannabis cultivators are adapting their cultivation and harvesting methods in order to maximize profits and reduce the risk of eradication. In 2006 law enforcement officials in several areas of the country, particularly California and Tennessee, reported that cultivators were changing their cultivation process from a single planting to two-crop plantings with shortened growing cycles. Cultivators achieve two growing cycles by planting specific cannabis strains that mature faster or by planting seedlings earlier in the spring. Cultivators in California, for example, are planting cannabis that buds earlier than most varieties and matures as early as June or July. Cannabis that is cultivated in the spring is harvested in early July, and the plot is replanted, allowing for an additional harvest in September or October. Additionally, law enforcement officials have reported that cultivators are harvesting as many plants as practical, including marginally mature plants, immediately prior to the height of eradication season or before eradication efforts move into the area, in order to avoid the risk of an entire crop seizure (see Figure 1 on page 8).

1. BC Bud, which originally referred to sinsemilla grown in British Columbia, has become synonymous with high-grade marijuana from Canada. The THC (delta-9-tetrahydrocannabinol) content of BC Bud ranges from an average of 10 to 15 percent but can be as high as 30 percent.

NDIC

Figure 1. Crop harvested prior to eradication efforts in Napa County, California, September 2006.

Outdoor cannabis cultivation by Caucasian criminal groups in western states is relatively low compared with that of Mexican DTOs; however, cultivation by Caucasian growers in Appalachian states is high and may be increasing. While Mexican DTOs dominate cannabis cultivation in western states, Caucasian criminal groups and independent growers control most cannabis cultivation in the Appalachian Region. Most of the criminal groups operating grow sites in Kentucky, Tennessee, and West Virginia are typically composed of three to eight Caucasian males who are related along family lines. In fact, many of these family-based groups have been involved in marijuana cultivation and trafficking for decades, spanning several generations. Moreover, cannabis cultivation by Caucasian growers is often accepted by the local populace as a means for supplementing incomes in economically depressed Appalachian communities. Eradication efforts in many areas of Appalachia have increased in recent years; however, cultivation also appears to be increasing as cultivators relocate to areas where eradication efforts are less intense.

Indoor Cultivation

Domestic indoor cannabis cultivation is increasing in some areas of the country as growers attempt to avoid outdoor eradication and attain higher profits through production of indoor-grown, high potency marijuana. According to law enforcement reporting, vigorous outdoor cannabis eradication has caused many marijuana producers in areas of California and Tennessee to relocate indoors where production is more concealed (see text box titled Indoor Grow Sites on page 9). In addition to a reduced risk of detection, indoor cannabis cultivators benefit from higher profits because cultivation is a year-round process with four to six harvests per year and controlled conditions that enable growers to produce high quality marijuana that commands higher prices in most drug markets. For example, according to drug price data from the National Drug Intelligence Center (NDIC) December 2006 National Illicit Drug Prices, domestic midgrade marijuana grown outdoors in Los Angeles sold for $700 to $750 per pound, whereas high potency marijuana sold for $2,500 to $6,000 per pound. This price difference is common in drug markets throughout the country. These factors have contributed to the sharp increase in indoor cultivation reported by law enforcement, evidenced by a 71 percent increase in indoor plant eradication from 2001 (236,128 plants) to 2006 (403,322 plants). Moreover, the number of indoor sites seized increased 38 percent from 2001 (2,379 sites) to 2006 (3,286 sites).

Many Canada-based Asian DTOs that cultivate cannabis at indoor grow sites are relocating from Canada to the United States. Canada-based Asian groups (primarily ethnic Vietnamese and Chinese groups) are operating

Indoor Grow Sites

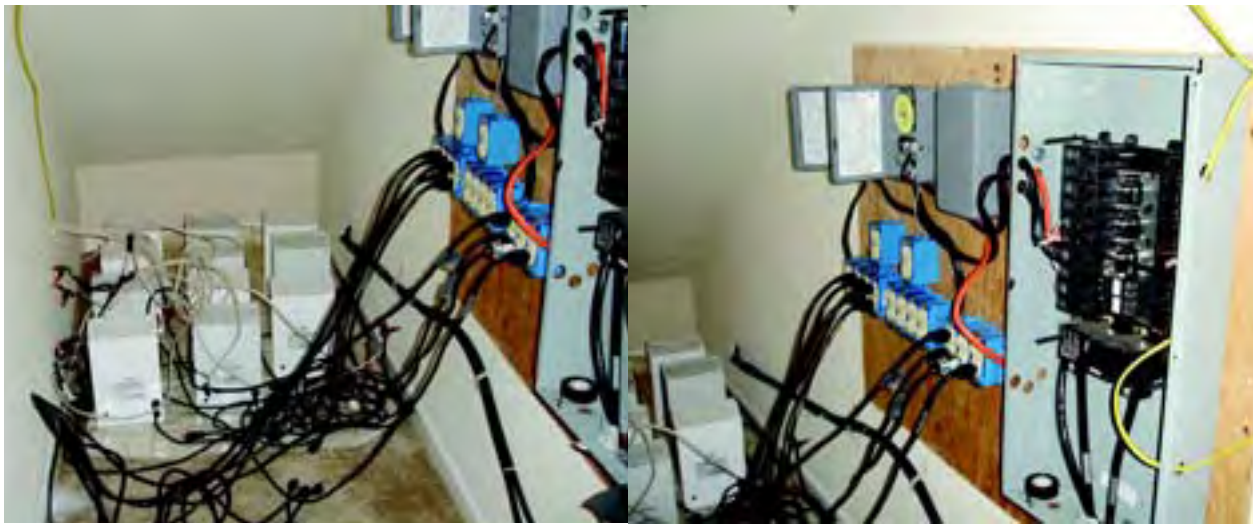
Indoor cultivation sites range from a single closet to entire houses or buildings that are converted into sophisticated grow operations. Indoor cannabis cultivators frequently employ advanced agricultural practices such as plant cloning; hydroponics; automatic light metering, irrigation, and fertilizing; and refined insecticides to enhance the rate of growth. Hydroponics is a particularly effective cultivation method, especially at indoor locations; however, it is not always preferred by growers over traditional soil cultivation. In fact, law enforcement reporting indicates that soil cultivation is preferred over hydroponics by some groups, including Asian DTOs operating indoor grows in Washington and Cuban DTOs operating indoor grows in southern Florida.

an increasing number of indoor grow sites within the United States, predominantly in the Pacific Northwest and throughout much of California. However, indoor grow sites are emerging in northeastern states, including those in New England. To this end, preliminary law enforcement reporting suggests that some of the Asian-operated indoor grows in New England are linked to Asian organizations based in Canada. The emergence of Asian-operated indoor grows in northeastern states parallels the recent appearance of grow sites controlled by Asian DTOs in eastern Canada (Ontario and Quebec) reported by the Royal Canadian Mounted Police (RCMP)—Asian-operated grow sites typically have been located in western Canada (British Colombia). The extent of this activity has been difficult for law enforcement to establish, since most Asian DTOs that cultivate cannabis in the United States are tight-knit, family-based groups that are difficult to infiltrate. Asian DTOs often conceal their indoor operations by purchasing or renting houses, modifying the structure for the purpose of cultivating high-grade cannabis, and quickly abandoning the premises after harvesting only four to six high potency crops. In many instances, these DTOs spend thousands of dollars to modify and equip their indoor grow sites. For example, Asian DTOs purchase and install advanced hydroponic growing equipment such as grow lights, automatically timed watering and fertilizing systems, and exhaust systems with large charcoal HEPA filters. Sophisticated operations often bypass electric meters, thereby eliminating high-energy usage readings, large electricity bills, and possible law enforcement scrutiny.

Seizure of Asian Indoor Grow Operations in Elk Grove, California

On August 29, 2006, law enforcement authorities reported that over 10,000 marijuana plants were seized from 14 Elk Grove, California, area residences as part of an investigation into Asian DTO-operated indoor marijuana growing operations in the San Francisco Bay area. According to DEA, the electricity to each home had been rewired to bypass the electric meter, thereby creating a significant fire hazard (see Figure 2 on page 10).

Cannabis cultivation in Florida has increased dramatically in recent years, led by an increasing number of indoor grow sites operated by Cuban DTOs and criminal organizations. Indoor cannabis cultivation occurs in many counties throughout Florida (see Map 7 in Appendix B) and greatly exceeds that of outdoor cultivation in Florida, according to the Florida Department of Law Enforcement (FDLE). The predominance of indoor grows in Florida is evidenced by the number of indoor seizures (36,172 plants) compared with outdoor seizures (10,354 plants) in 2006 (see Table 7 on page 10). The FDLE further reports that the number of indoor cannabis grows operated by Cuban organizations in South Florida has increased sharply and is the leading cause of the increase in indoor grow seizures between 2001 (210) and 2006 (384). Cuban organizations



City of Elk Grove, California, Police Department

Figure 2. Hazardous electrical diversion in an Elk Grove, California, indoor cannabis grow site.

Table 7. Number of Cannabis Plants Eradicated in Florida at Indoor and Outdoor Grow Sites, 2001–2006

	2001	2002	2003	2004	2005	2006
Indoor	15,151	19,506	21,442	21,879	45,217	36,172
Outdoor	13,055	18,348	16,302	6,127	29,646	10,354
Total	**28,206**	**37,854**	**37,744**	**28,006**	**74,863**	**46,526**

Source: Domestic Cannabis Eradication/Suppression Program.

reportedly operate indoor grows throughout Broward, Collier, Hendry, Miami-Dade, Palm Beach, and St. Lucie Counties in Florida. Cuban-operated indoor grows are not highly sophisticated but are somewhat advanced, often utilizing partial residence grows, single-room air conditioners or multiple air conditioning-units concealed behind fences, and insulated walls and windows designed to conceal the heat signature produced by grow lights.

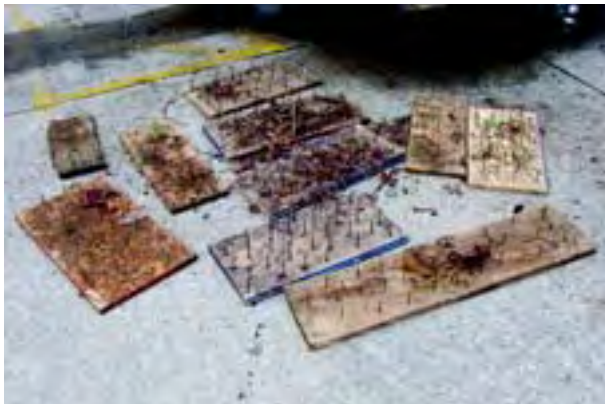
Violence, Countersurveillance, and Camouflage

Cannabis cultivation operations are deliberately located by growers in remote areas of public and private lands to lessen the chance of discovery from passersby or law enforcement. These sites are often concealed by camouflage and protected by armed guards conducting countersurveillance. Some sites are also protected by potentially life-threatening booby traps. These operations pose a particular threat to unwitting visitors, hunters, and hikers who often enter the remote areas where grow sites are located and are confronted—and sometimes fired upon—by armed guards.

Cannabis growers, particularly Mexican DTOs in California and Washington, are becoming more aggressive in protecting cultivation sites. Since 2003 the number of armed encounters between law enforcement officers and cannabis grow-site operators in California and Washington has significantly increased. Cannabis cultivators are employing armed guards who are strategically stationed at elevations above the grow site in order to detect approaching law enforcement scouts—usually one or two officers scouting remote areas for grow sites. Over the past 3 years these guards,

armed with weapons ranging from pellet guns to assault rifles, have increasingly engaged law enforcement officials in armed standoffs and, on several occasions, have exchanged gunfire with law enforcement scouts. These guards attempt to repel the patrols long enough for crop tenders to harvest as much of the cannabis as possible before a larger law enforcement contingent returns to eradicate the site. According to law enforcement officials, armed individuals are increasingly protecting cannabis crops because of their high value, increased competition with other growers, and increasing eradication pressure, and because many crop tenders, who are illegal aliens, must harvest the crop as payment to a Mexican DTO for their entry into the United States. Armed encounters between grow-site operators and private citizens reportedly are infrequent; however, the likelihood of such encounters is increasing, particularly since DTOs are establishing more outdoor grow sites on public lands, including national parks and game lands, especially in northern California. One such confrontation occurred in October 2006, when a man hunting in a remote location within the Mendocino National Forest was fired upon by four individuals after he inadvertently approached the edge of a cannabis grow site. Additionally, in June 2006, two individuals near a grow site in a remote area north of Covelo, California, were shot and killed.

The use of unattended booby traps by Mexican DTOs at large outdoor cultivation operations in western states has decreased over the past several years—armed guards are now preferred. Until the mid- to late 1990s, Mexican DTOs frequently protected outdoor cannabis grow sites from intrusion with potentially lethal booby traps. Typical booby traps included fishhooks strung from trees, rat traps configured with shot gun shells designed to discharge when tripped, trip lines, and animal traps. Since the late 1990s, however, cultivators have increasingly employed armed guards, and at larger plots they often employ several additional individuals (typically two who tend the site on a rotating basis). As a result, law enforcement officials are encountering fewer booby-trapped sites. However, unlike law enforcement officials in western states, the Kentucky State Police (KSP) reported an increase in booby trap use in smaller, usually unattended, outdoor cannabis plots in 2006. Growers in Kentucky, predominantly Caucasian independent growers, use a variety of booby traps, including punji sticks (see Figure 3)—which may be camouflaged by leaves and brush or incorporated into pits—and explosive devices to reduce the risk of crop theft.



U.S. Department of Agriculture Forest Service

Figure 3. Punji stick boards seized from cannabis cultivation operations in Kentucky, 2006.

The use of camouflage and countersurveillance by outdoor cannabis cultivators is common and often effective. Law enforcement reporting from leading cultivation states, including California, Kentucky, and Oregon, indicates that grow-site operators commonly camouflage marijuana crops by planting cannabis under tree canopies to conceal the crop from aerial surveillance. Some cultivators also camouflage their crops by commingling cannabis with legitimate crops. Tents and equipment used by plot tenders also are often camouflaged with netting or painted in camouflage colors and patterns. To further evade detection, cultivators often employ methods of countersurveillance to monitor activity in their

area. The plot tenders' most common method of countersurveillance is simply patrolling a grow site to observe any human activity. Additionally, the Oregon Department of Justice reports that some plot tenders in that state are beginning to sweep trails leading to grow sites free from signs of foot traffic; they later check trails for footprints as a method of monitoring movement in the area.

Associated Environmental Damage

Outdoor cannabis cultivation, particularly on public lands, is causing increasing environmental damage. Outdoor cannabis cultivation poses significant environmental concerns for law enforcement and other public agencies. Grow site operators often contaminate and alter watersheds; divert natural water courses; clear-cut native vegetation; poach protected wildlife; discard garbage, nonbiodegradable materials, and human waste at deserted sites; and create wildfire hazards. Moreover, the National Parks Conservation Association (NPCA) reports that while preparing land for cannabis cultivation, growers commonly clear the forest understory, which allows nonnative plants to supplant native ones, adversely affecting the eco-system. They also terrace the land—especially in mountainous areas—which results in rapid erosion. The cost of restoring land damaged by such outdoor cultivation is significant; the National Park Service estimates that for every acre of forest planted with marijuana, 10 acres are damaged, and further, the cost to repair and restore an outdoor cultivation site is approximately $11,000 per acre.

Outdoor cannabis cultivators are diverting streams and creeks for irrigation, sometimes draining natural streams and wetlands. Outdoor cannabis plots typically are irrigated with intricate watering systems. Cultivators often dam up streams and redirect the water through plastic gravity-fed irrigation tubing to supply water to individual plants (see Figure 5 on page 13). Average size marijuana plots—approximately 1,000 plants—require up to 5,000 gallons of water daily. This high demand for water often strains small streams and damages downstream vegetation that depends on consistent water flow. For example, on October 4, 2006, law enforcement authorities eradicated a 1,200-plant cultivation operation in San Ramon, Contra Costa County after Park Rangers were alerted that water was no longer running in a nearby mountain stream. Cultivators had diverted the stream, building a reservoir for crop irrigation.

Dangerous Poisons From Mexico Polluting California National Forests

According to NFS and California Bureau of Narcotics Enforcement Campaign Against Marijuana Planting (CAMP), law enforcement officials are increasingly encountering dumpsites of highly toxic insecticides, chemical repellants, and poisons (see Figure 4 on page 13) that are produced in Mexico, purchased by Mexican criminal groups, and transported into the country for use at their cannabis grow sites. Although similar chemicals could be purchased in the United States, many Mexican DTOs are simply using Mexican chemicals rather than purchasing bulk quantities locally, which could alert law enforcement to their cultivation operations. Cultivators apply insecticides directly to plants to protect them from insect damage. Chemical repellants and poisons are applied at the base of the cannabis plants and around the perimeter of the grow site to ward off or kill rats, deer, and other animals that could cause crop damage. These toxic chemicals enter and contaminate ground water, pollute watersheds, kill fish and other wildlife, and eventually enter residential water supplies.

Source: U.S. Department of Agriculture Forest Service; Environmental Protection Agency.

U.S. Department of Agriculture Forest Service

Figure 4. Toxic insecticide bottle found at a cannabis cultivation operation in California, 2006.

U.S. Department of Agriculture Forest Service

Figure 5. Reservoir used in a cannabis cultivation operation in the Shasta-Trinity National Forest in 2006.

Eradication Estimates

Precise estimates regarding the number of cannabis plants not eradicated during the most recent eradication season are not feasible, owing to many factors. The amount of marijuana cultivated in the primary states and counties is determined by three factors that are used to calculate the quantity of marijuana available in the United States: domestic cannabis eradication totals, cannabis plant yield estimates, and the effectiveness of cannabis eradication. Estimates vary greatly with respect to each of these critical factors. Therefore, a true and accurate point estimate of the amount of cannabis not eradicated within the primary cultivation states is not possible.

Although a precise estimate of cannabis not eradicated is not possible, general estimates can be made and ranges calculated using available eradication data. For example, in the model in Table 8 on page 14,[2] the total number of plants eradicated is derived by adding the estimated number of eradicated plants reported by Domestic Cannabis Eradication/Suppression Program (DCE/SP), Forest Service, and DOI. According to these sources, an estimated 6.3 million plants were eradicated in 2006. Assuming a plant yield of 1 pound per plant (448 grams), approximately 2,825 metric tons of potential marijuana were destroyed through domestic cannabis eradication in 2006. Law enforcement reporting indicates that eradication programs destroyed 30 to 50 percent of cannabis plants during the 2006 season. Based on these estimates and assumptions, between 2,825 and 6,592 metric tons of marijuana were not destroyed during 2006 (see Table 8 on page 14).

Combining known eradication statistics with estimates of cannabis not eradicated results in an estimate of total potential domestic cannabis cultivation ranging from 5,650 metric tons to 9,417 metric tons.

2. This model was adapted from the Marijuana Availability Model used by the Drug Availability Steering Committee.

Table 8. Estimated Number of Cannabis Plants Not Eradicated, 2006

	Cannabis Plants Eradicated, 2006 (mt)		Potential Marijuana Eradicated (mt)	
DCE/SP	4,486,755		2,010	
USFS/DOI	1,818,447		815	
Total	**6,305,202**		**2,825**	
Eradication Rate=>	30%		40%	50%
Potential Marijuana Not Eradicated (mt)	6,592 (70%)		4,236 (60%)	2,825 (50%)

Intelligence Gaps

Law enforcement efforts over the past several years have provided significant insight into the nature and extent of cannabis cultivation and marijuana production in the United States. However, intelligence gaps do exist, primarily:

- The extent of DTO and criminal group involvement in the Appalachian region is unknown because cannabis cultivation is largely rooted in generations of families within insular communities.
- Eradication statistics are underreported in some areas because no requirements exist for such reporting. Some counties do not have agreements with DCE/SP, and therefore eradication totals are not recorded to the DCE/SP program.
- Mexican DTO involvement in outdoor cannabis cultivation operations is significant; however, determining the extent of their involvement in many areas of the country is difficult because law enforcement resources are insufficient to fully investigate these groups.
- Limited information as to the domestic cannabis cultivation operations of Asian DTOs and criminal groups—a result of the insular nature of the communities—degrades accurate analysis as to the full extent of their operations in the United States.

Appendix A. Primary Cannabis Cultivation Regions

The following section addresses primary cannabis cultivation areas, planting and harvesting seasons, organizations involved, and major trends and developments in outdoor and indoor cannabis cultivation operations in each primary cultivation state. The primary cannabis cultivation areas are located in two distinct regions: western states and Appalachia. Because many cultivation trends are consistent among states within these unique regions, the summaries of each primary cultivation state are grouped by region.

Western Region

California

Cannabis cultivation and marijuana production operations are extensive throughout California, particularly in northern California. Outdoor cannabis cultivation is increasing dramatically in the northern region of the state, primarily because of expanded cultivation by Mexican DTOs; as a result, the area is becoming one of the most significant outdoor cannabis grow areas in the state. Indoor cannabis cultivation also appears to be increasing. The increase is primarily attributed to the demand for higher potency marijuana. However, some law enforcement officials in California report that the increase is partly the result of California Proposition 215 (commonly referred to as the *medical marijuana law*), which has negatively impacted marijuana-related prosecutions, resulting in a perception among many indoor growers that law enforcement is reluctant to seize plants or arrest growers.

California Cultivation Statistics

Primary cultivation area: Entire state

Top five cultivation counties: Lake, Shasta, Mendocino, San Diego, Riverside

2006*

Total plants eradicated: 3,846,017

Total outdoor plants eradicated: 3,668,744

Total indoor plants eradicated: 177,273

2005

Total cannabis plants eradicated: 3,021,240

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Outdoor Planting and Harvesting

The primary cannabis planting, growing, and harvesting seasons for southern, central, and northern California are similar and typically occur from April through October. Cannabis seeds or seedlings are planted in spring, usually in April or May, and tended through the summer; they reach plant maturity in September or October. However, this time frame can differ if cultivators plant early by operating cannabis seed beds in an indoor operation for subsequent seedling transfer to outdoor gardens as soon as the threat of frost has passed. Moreover, law enforcement officials have reported a relatively new trend in which cultivators are harvesting the crop or the bud from the plants as early as July to maximize profits and avoid possible loss through law enforcement seizure during late season eradication operations.

Primary Outdoor Cultivation Areas

Outdoor cannabis cultivation operations, once concentrated in central and southern California, are becoming increasingly prevalent in the remote regions of northern California, particularly in Lake, Shasta, and Mendocino Counties. Eradication data indicate that between 2005 and 2006, increases in eradication in northern California counties overshadowed moderate increases occurring in southern

Campaign Against Marijuana Planting (CAMP)

CAMP is a multiagency law enforcement task force managed by the California Department of Justice, Bureau of Narcotics Enforcement, and composed of local, state and federal agencies. CAMP agents are broken into five teams covering northern, central, and southern California regions. CAMP members are assisted in their eradication efforts by the U.S. Drug Enforcement Administration, the U.S. Bureau of Land Management, the U.S. Department of Agriculture Forest Service, the California National Guard, the California Department of Fish and Game, the California State Parks, and dozens of county sheriff agencies and local police departments.

counties. Outdoor cannabis eradication in northern California appears to be most prevalent in the following adjacent counties: Butte, Colusa, Glenn, Humboldt, Lake, Lassen, Mendocino, Placer, Plumas, Shasta, Siskiyou, Solano, Sonoma, Tehama, Trinity, Yolo, and Yuba (see Table 9 on page 17). This increase is attributed primarily to Mexican DTOs expanding operations northward into more remote areas of national forests and private lands, particularly mountainous areas, to avoid law enforcement detection and discovery through aerial surveillance. However, counties in southern California, primarily San Diego County, but also Riverside, Santa Barbara, and Ventura Counties posted significant increases in cannabis eradication in 2006, albeit less than northern counties (see Maps 8, 9, and 10 in Appendix B).

Primary Indoor Cultivation Areas

Indoor cultivation operations in California dramatically increased over the past several years, as a result of increased law enforcement pressure on outdoor cultivation, successes in aerial eradication, and improved technology for detecting outdoor grows. Indoor operations are generally conducted by Caucasian independent growers, typically males between the ages of 25 and 35, generally cultivating an average of 200 to 300 plants per cultivation cycle. Significant quantities of cannabis plants—primarily from Caucasian-operated indoor grows—were seized in Humboldt, Alameda, Mendocino, Sacramento, and San Francisco Counties in the first 11 months of 2006 (see Table 10 on page 17). Additionally, law enforcement reporting indicates a continuing trend of typically larger, multithousand-plant indoor grows operating in Humboldt County contributing to a rise in overall eradication. In fact, DCE/SP data indicate that Humboldt County had the highest reported number of indoor plants eradicated between January and November 2006 (31,508), increasing 19 percent from 26,411 plants in 2005 (see Maps 11 and 12 in Appendix B).

Although Caucasian criminal groups and independent dealers are the primary indoor cultivators in the state of California, law enforcement reporting indicates that Asian DTOs and criminal organizations are increasingly cultivating the drug indoors in several areas of the state. Asian organizations have been identified in central and northern California—specifically the San Francisco Bay area. For example, an Asian organization was recently discovered operating indoor grow sites in 41 residences in the Sacramento and Stockton, California, areas. These indoor operations were typically located in residential housing within suburban neighborhoods in which entire houses had been converted into highly sophisticated cultivation operations.

Table 9. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties in California, 2006*

County	Outdoor Cannabis Eradicated
1. Lake	346,415
2. Shasta	264,287
3. San Diego	241,449
4. Mendocino	239,076
5. Riverside	210,005
6. Tehama	191,863
7. Fresno	172,075
8. San Bernardino	136,595
9. Tuolumne	126,706
10. Santa Clara	125,947

Source: Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

*Data for 2006 represent January through November 2006.

Table 10. Number of Indoor Cannabis Plants Eradicated Top 10 Counties in California, 2006*

County	Indoor Cannabis Eradicated
1. Humboldt	31,508
2. Alameda	29,428
3. Mendocino	17,443
4. Sacramento	16,901
5. San Francisco	12,745
6. San Diego	10,849
7. Sonoma	9,080
8. San Mateo	7,980
9. San Luis Obispo	7,499
10. San Joaquin	6,100

Source: Domestic Cannabis Eradication/Suppression Program.

*Data for 2006 represent January through November 2006.

Hawaii

Hawaii has long been a primary source area for high potency marijuana; however, law enforcement pressure and increased interdiction efforts have led to a slight decline in overall marijuana production in the state in recent years. Despite increased law enforcement focus, local and Polynesian DTOs, Asian and Caucasian groups, and independent dealers continue to cultivate cannabis, primarily on the island of Hawaii.

Hawaii Cultivation Statistics

Primary cultivation areas: Hawaii and Maui Counties

Top two cultivation counties: Hawaii and Maui

2006*

Total plants eradicated: 187,707

Total outdoor plants eradicated: 175,730

Total indoor plants eradicated: 11,977

2005

Total cannabis plants eradicated: 255,113

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Outdoor Planting and Harvesting

Because of the tropical climate in the Hawaiian Islands, cannabis is planted and harvested year-round. The suitable climate combined with nutrient-rich soils provides optimal cultivation conditions for growers to plant and harvest marijuana at any time of the year. As a result, no distinct planting or harvesting seasons exist.

Primary Outdoor Cultivation Areas

Despite considerable decreases in outdoor cannabis eradication rates in Hawaii since 2001, the state consistently ranks among the top four states for the amount of cannabis eradicated each year. Law enforcement reporting indicates that most cannabis is cultivated on the islands of Hawaii, Maui, Kauai, and Oahu—four of the eight separate islands composing the state. In addition, according to eradication data, domestic marijuana is cultivated primarily on State Division of Land and Natural Resources lands in Hawaii and Maui Counties. DEA Honolulu District Office reports that of the 159,702 plants eradicated from outdoor grow sites in the state of Hawaii from January through November 2006, 75 percent were cultivated on public lands owned by the state of Hawaii. Specifically, NPS reports significant cannabis cultivation in the Hawaii Volcanoes National Park on the island of Hawaii. Outdoor cultivation operations are conducted primarily by local and Polynesian DTOs and Asians, as well as some Caucasians, particularly those who have relocated to Hawaii from the U.S. mainland (see Maps 13 and 14 in Appendix B).

Primary Indoor Cultivation Areas

Indoor cannabis cultivation in Hawaii occurs less frequently than outdoor cultivation; however, indoor cultivation appears to be stable or possibly increasing. According to DCE/SP, the number of plants eradicated from indoor operations increased sharply from 314 plants in 2002 to 3,519 in 2003 and increased again in 2005 to 3,950. Moreover, DEA Honolulu District Office reports that the number of indoor cultivation sites seized increased from 13 in 2005 to 37 as of October 31, 2006. Local Hawaiians, Caucasian independents, and Asian organizations operate most indoor grow sites in Hawaii (see Maps 15 and 16 in Appendix B).

Oregon

Outdoor cannabis cultivation appears to be increasing in Oregon, including on public lands, primarily because of an increase in outdoor cultivation by Mexican DTOs operating large-scale cannabis grow sites.

Oregon Cultivation Statistics

Primary cultivation area: Northwestern region of the state

Top five cultivation counties: Jackson, Grant, Josephine, Wheeler, and Linn

2006*

Total plants eradicated: 139,409

Total outdoor plants eradicated: 134,191

Total indoor plants eradicated: 5,218

2005

Total cannabis plants eradicated: 91,829

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Outdoor Planting and Harvesting

Oregon's temperate climate, rich soil, and vast expanses of remote, forested areas are particularly conducive to outdoor cannabis cultivation. Outdoor cannabis cultivation in Oregon typically spans the months of May through October; however, weather conditions and the use of seeds and cloned starter plants can extend or reduce the growing season. In the eastern region of Oregon—east of the Cascade Mountains—cultivation operations begin as early as March or April, although most planting usually occurs in May. Weather conditions during the growing months significantly influence the harvest time, but plants typically are harvested during August and September. West of the Cascades, sites are usually planted in June, tended through summer, and harvested in September and October.

Primary Outdoor Cultivation Areas

The number of large-scale outdoor marijuana grow sites in Oregon is increasing and will quite likely continue to increase as Mexican DTOs currently operating in the state expand their operations. Several counties in Oregon—particularly in the southwestern section of the state—have been identified by law enforcement as counties experiencing significant Mexican DTO-controlled cannabis cultivation. In addition to Mexican DTOs, Caucasian criminal groups and independent growers cultivate cannabis outdoors; however, Caucasian-controlled grow sites are generally much smaller and contain fewer plants. According to eradication data and law enforcement reporting, most outdoor cannabis cultivation in 2006 appears to have occurred in Jackson, Grant, Josephine, Wheeler, and Linn Counties (see Table 11 on page 20). Many of the cannabis cultivation operations in these counties have been located on remote lands in national forests and on tribal lands, primarily in the northwestern section of Oregon. Areas where cultivation has been particularly high include the Deschutes, Siskiyou, Umatilla, and Wallowa-Whitman National Forests and Native American tribal lands, including the Umatilla Indian Reservation (see Maps 17 and 18 in Appendix B).

Primary Indoor Cultivation Areas

Indoor cannabis cultivation in Oregon is much less prominent than outdoor cultivation. According to the Oregon Department of Justice, indoor cannabis eradication is highest in Multnomah, followed by Lincoln, Douglas, and Marion Counties (see Table 12 on page 20). Most indoor cannabis grow sites are controlled by Caucasian criminal groups and independent growers; however, anecdotal reporting indicates that Asian organizations have become increasingly involved in indoor cultivation over the past year. Caucasian criminal groups and independent growers typically operate indoor grow sites that average 50 to 100 plants per cultivation cycle, particularly in the Portland area (see Maps 19 and 20 in Appendix B).

Table 11. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties in Oregon, 2006*

County	Outdoor Cannabis Eradicated
1. Jackson	50,995
2. Grant	20,138
3. Josephine	15,739
4. Wheeler	12,000
5. Linn	11,113
6. Coos	7,899
7. Union	4,800
8. Tillamook	2,988
9. Douglas	2,836
10. Lane	2,531

Source: Oregon Department of Justice; Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

*Data for 2006 represent January through November 2006.

Table 12. Number of Indoor Cannabis Plants Eradicated Top 10 Counties in Oregon, 2006*

County	Indoor Cannabis Eradicated
1. Multnomah	1,639
2. Lincoln	883
3. Douglas	475
4. Marion	444
5. Lane	335
6. Wasco	287
7. Benton	260
8. Klamath	257
9. Jackson	205
10. Coos	162

Source: Oregon Department of Justice; Domestic Cannabis Eradication/Suppression Program.

*Date for 2006 data represent January through November 2006.

Washington

Cannabis cultivation is increasing in Washington. Outdoor cannabis cultivation is expanding primarily because of increased cultivation by Mexican DTOs. Indoor cultivation—particularly in the Puget Sound area—also is increasing, as a result of an influx of Canadian-based Asian DTOs experienced in indoor cultivation techniques.

Washington Cultivation Statistics

Primary cultivation area: Eastern section of the state

Top five cultivation counties: Yakima, King, Franklin, Chelan, and Stevens

2006*

Total plants eradicated: 133,778

Total outdoor plants eradicated: 101,339

Total indoor plants eradicated: 32,439

2005

Total cannabis plants eradicated: 170,255

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Outdoor Planting and Harvesting

Planting and harvesting times differ greatly in Washington, depending on the location in the state; Washington, much like Oregon, is divided into two distinct east and west sections that are separated by the Cascade Mountains. In the east, planting begins as early as March or April, with most planting occurring in May. Depending on the weather conditions during the summer months as well as other factors, including the use of cloned seedlings versus seeds, crops typically are harvested between August and September. West of the Cascade Mountains, planting and harvesting occur later in the year. Planting typically begins in June, and harvest occurs in September or early October.

Primary Outdoor Cultivation Areas

Cannabis cultivation in outdoor sites is most prevalent in eastern Washington because of the area's climate. Large outdoor growing operations in eastern Washington, which typically are controlled by Mexican DTOs, are usually located in remote areas near water sources on federal or state lands. Counties reporting the highest plant eradication for 2006 include Yakima, Franklin, Chelan, Stevens, and Benton (see Table 13 on page 22). The Northwest HIDTA reports that the counties accounting for much of the outdoor cannabis cultivation in the state—which are largely the counties with the highest eradication—are Yakima, Chelan, Franklin, Grant, Benton, Douglas, and Ferry. Following the seizure of a single 64,000-plant plot on the Yakima Indian Reservation in 2004, many cultivators stopped planting large plots and now plant several smaller plots instead to reduce their losses if a plot is eradicated. Cultivators also commingle cannabis plants with legitimate crops such as corn and olive trees to conceal cannabis plants (see Maps 21 and 22 in Appendix B).

Primary Indoor Cultivation Areas

Indoor cannabis cultivation sites are typically operated by Caucasian independent growers and are more common in urban areas. However, some Vietnamese DTOs have relocated their high potency indoor cannabis cultivation operations from Canada to the Puget Sound area, primarily to avoid seizures of their marijuana at the U.S.–Canada border. As a result, there has been an increase in the availability of higher potency marijuana in local drug markets. King, Pierce, and Snohomish Counties are the primary indoor cultivation areas for Asian DTOs and criminal groups, according to reporting from the Northwest HIDTA, DEA, and other law enforcement agencies. These counties are also among the highest overall indoor cannabis eradication counties in Oregon (see Table 14 on page 22, and Maps 23 and 24 in Appendix B).

Table 13. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties in Washington, 2006*

County	Outdoor Cannabis Eradicated
1. Yakima	51,730
2. Franklin	15,382
3. Chelan	7,802
4. Stevens	4,677
5. Benton	4,163
6. Grant	4,019
7. Grays Harbor County	3,319
8. Walla Walla County	3,102
9. Douglas County	1,588
10. Klickitat County	1,389

Source: Northwest High Intensity Drug Trafficking Area; Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

*Data for 2006 represent January through November 2006.

Table 14. Number of Indoor Cannabis Plants Eradicated Top 10 Counties in Washington, 2006*

County	Indoor Cannabis Eradicated
1. King	17,618
2. Whatcom	2,298
3. Pierce	2,077
4. Spokane	1,688
5. Stevens	1,650
6. Snohomish	1,488
7. Clark	1,366
8. Kitsap	1,095
9. Skagit	484
10. Thurston	441

Source: Northwest High Intensity Drug Trafficking Area; Domestic Cannabis Eradication/Suppression Program.

*Data for 2006 represent January through November 2006.

Appalachian Region

Cannabis cultivation in the Appalachian Region of the United States occurs primarily in portions of Kentucky, Tennessee, and West Virginia. A relatively high poverty rate in these areas contributes to an acceptance of cannabis cultivation by many local residents. In some Appalachian counties, more than 30 percent of the population lives in poverty, and in impoverished communities some residents regard marijuana production as a necessary means of supplementing low incomes. In these communities cannabis cultivation is often a multigenerational trade as young family members are introduced to the trade by older members who have produced the drug for many years.

Kentucky

Outdoor Planting and Harvesting

Cannabis growers in Kentucky typically cultivate plots between March and October; however, several factors, including the weather and the use of cloned starter plants, can extend or reduce the growing season. Cannabis planting in Kentucky typically starts in March. However, because the winter of 2006 was very mild, many growers who started their plants indoors were able to transplant the seedlings outside much earlier than in most years. Kentucky State Police Marijuana Suppression Unit reports that approximately 10 to 15 percent of all cultivators start their plants indoors. No discernible differences exist for planting and harvesting times in various regions of the state.

Kentucky Cultivation Statistics

Primary cultivation area: Southeastern section of the state

Top five cultivation counties: Knox, Bell, Leslie, Letcher, and Clay

2006*

Total plants eradicated: 527,820

Total outdoor plants eradicated: 526,691

Total indoor plants eradicated: 1,129

2005

Total cannabis plants eradicated: 736,991

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Primary Outdoor Cultivation Areas

Most outdoor cultivation in Kentucky occurs in the southeastern section of the state on remote areas of public and private lands; however, increased and improved eradication efforts have led some growers to shift their operations to counties with less eradication pressure. The highest eradication totals were reported in the southeastern section of Kentucky from January to November 2006 in the following counties: Knox, Bell, Leslie, Letcher, Clay, Perry, Breathitt, Wayne, Knott, and Whitley (see Table 15 on page 24). The focused eradication in these counties has contributed to a shift toward cultivation in other counties. For example, law enforcement reporting indicates that cultivation in Breathitt County is increasing after years of decreased cultivation, largely because of eradication pressure in surrounding counties. In addition, since 2003, cultivation has been increasing in areas where commercial logging is occurring, especially in the Daniel Boone National Forest. After land has been cleared as a result of logging operations, criminal groups and independent growers use the space for cannabis cultivation. Most cannabis cultivation operations in Kentucky are composed of families or small groups rather than large DTOs. These groups typically plant smaller plots, having averaged 67 plants per site in 2006 (see Maps 25, 26, 27, and 28 in Appendix B).

Indoor Cannabis Cultivation Areas

Eradication data and law enforcement reporting reveal that indoor cannabis cultivation is limited in Kentucky but may be increasing. According to DCE/SP data for 2006, 1,027 plants were eradicated

from 35 indoor grow operations in Kentucky as of November 30. However, law enforcement agencies report that they have been unable to locate several other indoor grow sites operating within the state. Eradication data indicate that the limited indoor cultivation in the state occurs primarily in Greenup, Bullitt, Meade, and Nelson Counties (see Table 16, and Maps 29 and 30 in Appendix B).

Table 15. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties in Kentucky, 2006*

County	Outdoor Cannabis Eradicated
1. Knox	48,670
2. Bell	39,877
3. Leslie	37,848
4. Letcher	35,814
5. Clay	30,580
6. Perry	30,344
7. Breathitt	29,847
8. Wayne	24,327
9. Knott	23,026
10. Whitley	20,188

Source: Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

*Data for 2006 represent January through November 2006.

Table 16. Number of Indoor Cannabis Plants Eradicated Top 10 Counties in Kentucky, 2006*

County	Indoor Cannabis Eradicated
1. Greenup	256
2. Bullitt	216
3. Meade	124
4. Nelson	103
5. Fayette	83
6. Hardin	67
7. Larue	62
8. Boone	27
9. McLean	27
10. Jackson	24

Source: Domestic Cannabis Eradication/Suppression Program.

*Data for 2006 represent January through November 2006.

Tennessee

Outdoor Planting and Harvesting

Cannabis cultivation operations in Tennessee generally extend from March through October; the primary planting season is late March and early April. However, some cultivators have been able to harvest a first crop in June and replant for a second crop. Generally, September and October are the prime harvesting months. Harvesting times in Tennessee do not differ from one region of the state to another.

Primary Outdoor Cultivation Areas

A great amount of high potency marijuana is produced in Tennessee by local Caucasian producers for sale both within and outside the region. Primary outdoor cultivation areas are located in remote areas with good growing climates, such as the Smokey Mountains of southeastern Tennessee and the Cumberland Plateau of northeastern Tennessee. The numerous streams, creeks, and rivers within these areas help provide cultivation sites with the necessary water to support plant growth during the summer months. Of the top five cannabis eradication counties in Tennessee in 2006, four were located in the Cumberland Plateau: Warren, Cumberland, Fentress, and Morgan. On the extreme western side of the Highland Rim in the middle section of the state, Wayne, Hickman, and Lawrence Counties also reported high plant eradication in 2006 (see Table 17). Although

Tennessee Cultivation Statistics

Primary cultivation areas: Cumberland Valley and Smokey Mountains in the northeastern and southwestern sections of the state

Top five cultivation counties: Warren, Cumberland, Fentress, Morgan, and Wayne

2006*

Total plants eradicated: 662,135

Total outdoor plants eradicated: 662,024

Total indoor plants eradicated: 111

2005

Total cannabis plants eradicated: 463,557

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Table 17. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties in Tennessee, 2006*

County	Outdoor Cannabis Eradicated
1. Warren	181,671
2. Cumberland	88,919
3. Fentress	43,828
4. Morgan	42,121
5. Wayne	40,641
6. Van Buren	37,308
7. Hickman	27,853
8. Grundy	26,757
9. Lawrence	26,553
10. Campbell	19,662

Source: Domestic Cannabis Eradication/Suppression Program.

*Data for 2006 represent January through November 2006.

these counties account for most of the cultivation in Tennessee, significant cannabis cultivation occurs in other counties, but it fluctuates from year to year. In fact, counties where cultivation has been dormant for several years have reemerged as significant sources of marijuana. For example, the number of cannabis plants eradicated in Sequatchie County in the Cumberland Valley—a county where cultivation had been low for several years—increased from 783 plants in 2005 to 10,846 plants in 2006, according to DCE/SP data (see Maps 31, 32, 33, and 34 in Appendix B).

Primary Indoor Cultivation Areas

Indoor cannabis cultivation in Tennessee is limited. In 2005, DCE/SP data showed that only 653 plants were seized from 3 counties and most (611 plants) were seized in Cocke County, followed by Montgomery County (33), and Campbell County (9) (see Map 35 in Appendix B). As of November 2006, DCE/SP did not report any indoor grow operation seizures in the state of Tennessee. Although indoor cultivation is limited, law enforcement has seized advanced indoor grow operations in past years (see text box). Although not reported to DCE/SP, the Tennessee Bureau of Investigation (TBI) seized a single indoor grow operation in Franklin County in June 2006, resulting in the eradication of 111 plants.

Indoor Cannabis Operation Seized From Cave Under Residence

In December 2005 the 15th Judicial District Task Force (JDTF), assisted by the 18th JDTF, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), Immigration and Customs Enforcement (ICE), the Federal Bureau of Investigation (FBI), the Lafayette Police Department, and the Trousdale County Sheriff's Office seized a sophisticated indoor cannabis operation in Hartsville, Trousdale County, Tennessee. The indoor operation was located in a man-made cave cut into the limestone under and adjacent to a private residence and was capable of producing six grows per year. Law enforcement officials seized 853 plants under cultivation. The entrance was sealed with a hydraulic door, and the growing area was equipped with custom irrigation systems and lighting, as well as humidity control devices.

West Virginia

Outdoor Planting and Harvesting

Cannabis cultivation in West Virginia extends from March through October. Cannabis typically is planted in March or April, tended through the summer, and harvested in September or early October.

Primary Outdoor Cultivation Areas

The amount of cannabis cultivated in West Virginia is lower than that of other areas in the Appalachian Region; the marijuana produced usually is consumed locally. The amount of marijuana produced in West Virginia does not come close to supplying demand throughout the state; therefore, a significant amount of Mexican marijuana is smuggled to West Virginia. Cannabis cultivation is often a primary source of income for residents in southwestern portions of West Virginia, the primary cultivation area in the state, which generally is economically depressed, with an unemployment rate of nearly 50 percent. This section of the state is particularly conducive to cannabis cultivation because of the vast tracts of remote, mountainous terrain in the Appalachian Mountains, consistent rainfall, and moderate temperatures during the growing season. According to 2005 and 2006 eradication data and law enforcement reporting, the primary counties for cannabis eradication include Monroe, Wayne, Logan, Kanawha, Clay, Mingo, Boone, Mason, McDowell, and Gilmer (see Table 18 on page 28). The West Virginia Metropolitan Drug Enforcement Network Teams Eradication Unit reports that it discovers an average of 600 cannabis cultivation sites each year in the southwestern region. Although most plots are relatively small, at least six sites in this region contained at least 1,000 plants each in 2006 (see Maps 36, 37, 38, and 39 in Appendix B).

West Virginia Cultivation Statistics

Primary cultivation area: Southwestern section of the state

Top five cultivation counties: Monroe, Wayne, Logan, Kanawha, and Clay

2006*

Total plants eradicated: 64,974

Total outdoor plants eradicated: 63,809

Total indoor plants eradicated: 1,165

2005

Total cannabis plants eradicated: 57,600

*County-level data represent January through November 2006 and include reporting from the Domestic Cannabis Eradication/Suppression Program, U.S. Department of the Interior, and U.S. Department of Agriculture Forest Service.

Primary Indoor Cultivation Areas

Indoor cultivation in West Virginia is far more limited than outdoor cultivation; however, the eradication and investigation of indoor operations is increasing because of a rise in law enforcement resources committed to such investigations in some counties. According to DCE/SP, the number of indoor operations seized increased from 34 in 2005 to 60 in 2006, but the number of plants eradicated rose from 843 to 1,165 during that same period. Most of the plants (1,151 of 1,165) eradicated in 2006 were eradicated from 14 sites in Kanawha and Gilmer Counties (see Table 19 on page 28, and Maps 40 and 41 in Appendix B).

Table 18. Number of Outdoor Cannabis Plants Eradicated Top 10 Counties* in West Virginia, 2006**

County	Outdoor Cannabis Eradicated
1. Monroe	17,505
2. Wayne	12,906
3. Logan	9,709
4. Kanawha	6,027
5. Clay	4,543
6. Mingo	4,221
7. Boone	3,229
8. Mason	1,542
9. McDowell	1,150
10. Gilmer	780

Source: Domestic Cannabis Eradication/Suppression Program; U.S. Department of the Interior; U.S. Department of Agriculture Forest Service.

*As of January 2007, data for 2006 were available for HIDTA counties only.

**Data for 2006 represent January through November 2006.

Table 19. Number of Indoor Cannabis Plants Eradicated Top 5 Counties* in West Virginia, 2006**

County	Indoor Cannabis Eradicated
1. Kanawha	845
2. Gilmer	306
3. Mason	6
4. Boone	5
5. Logan	3

Source: Domestic Cannabis Eradication/Suppression Program.

*As of November 2006, data for 2006 were available for HIDTA counties only.

**Data for 2006 represent January through November 2006.

Appendix B. Maps

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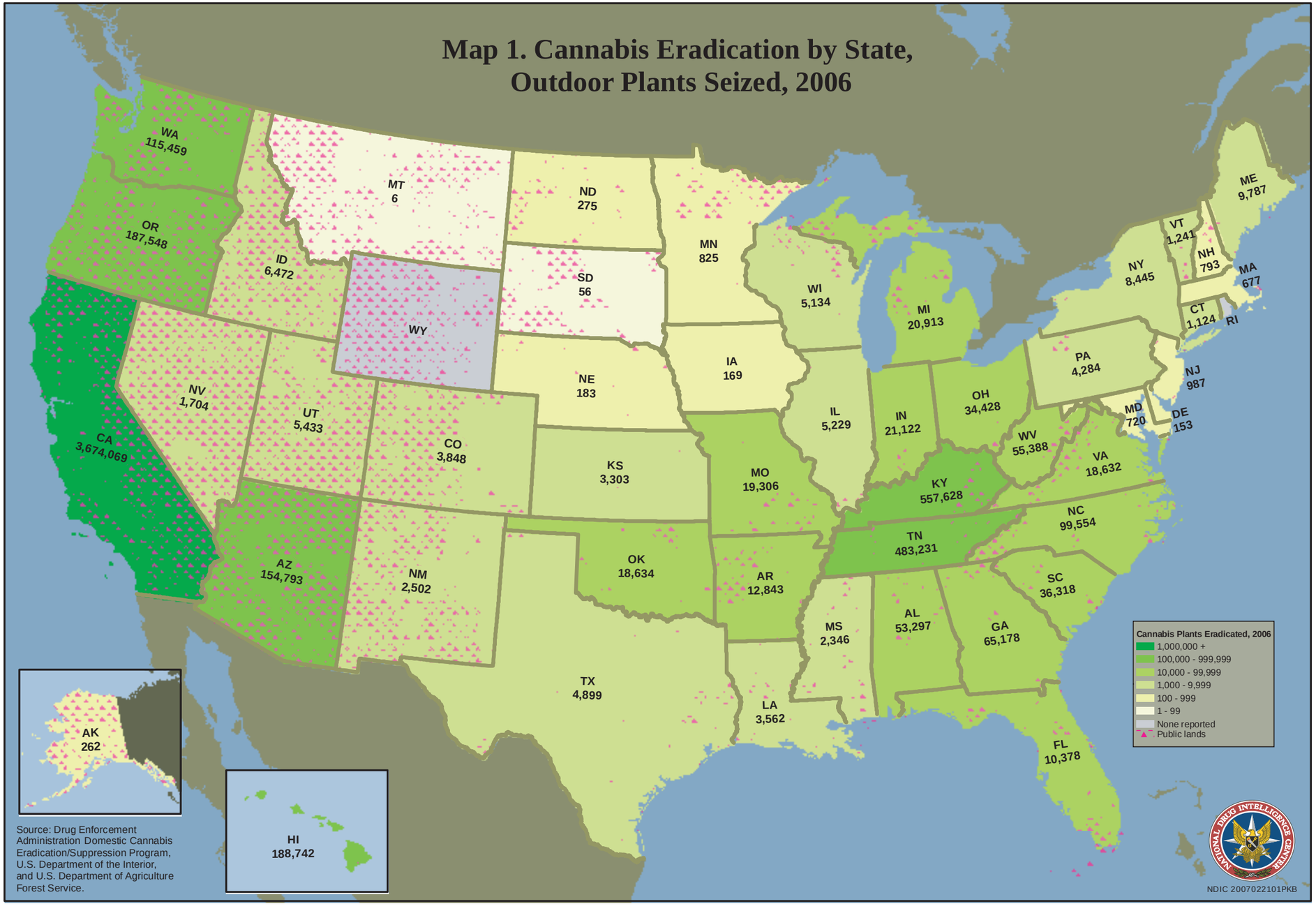

Map 1. Cannabis Eradication by State, Outdoor Plants Seized, 2006.

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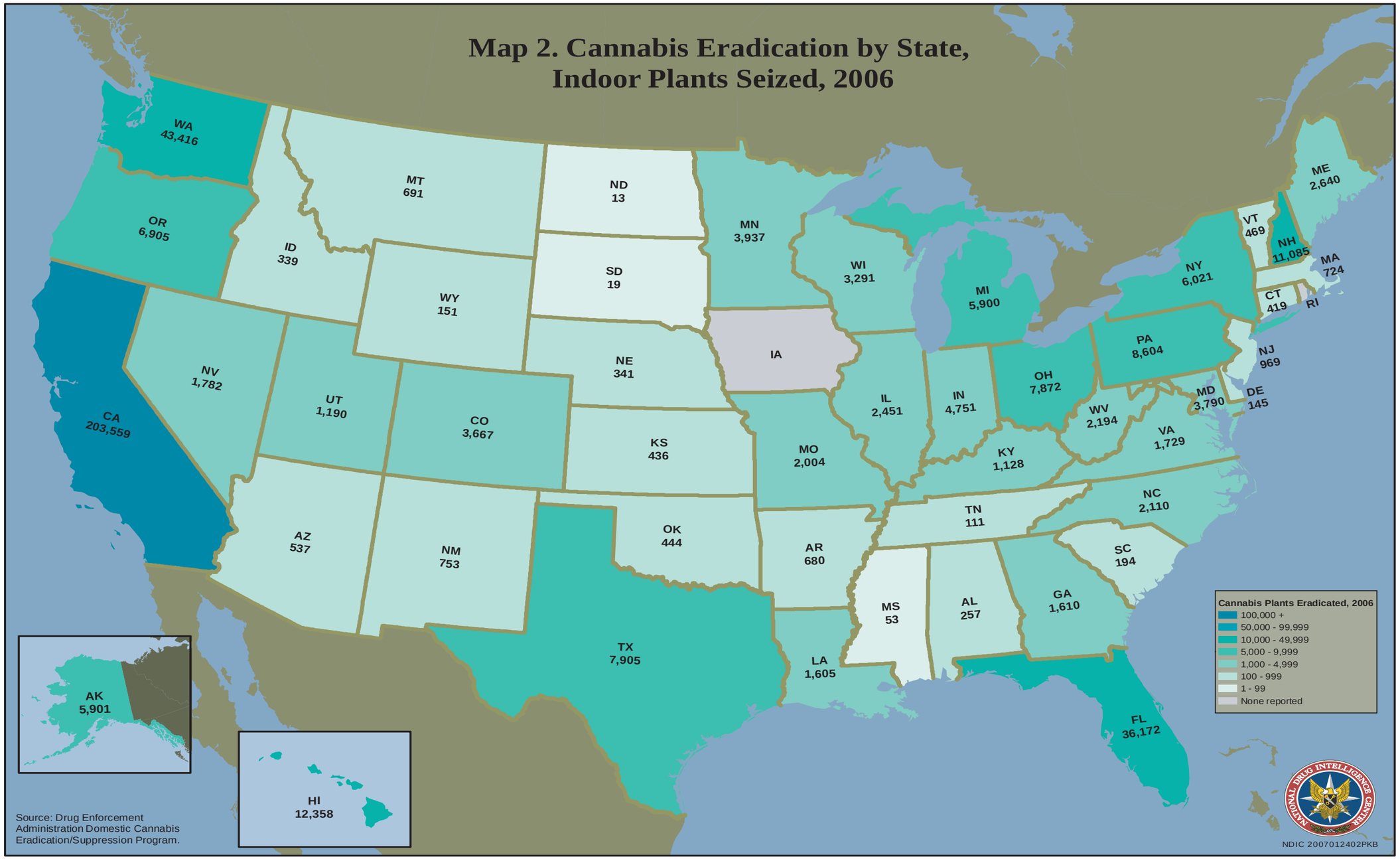

Map 2. Cannabis Eradication by State, Indoor Plants Seized, 2006.

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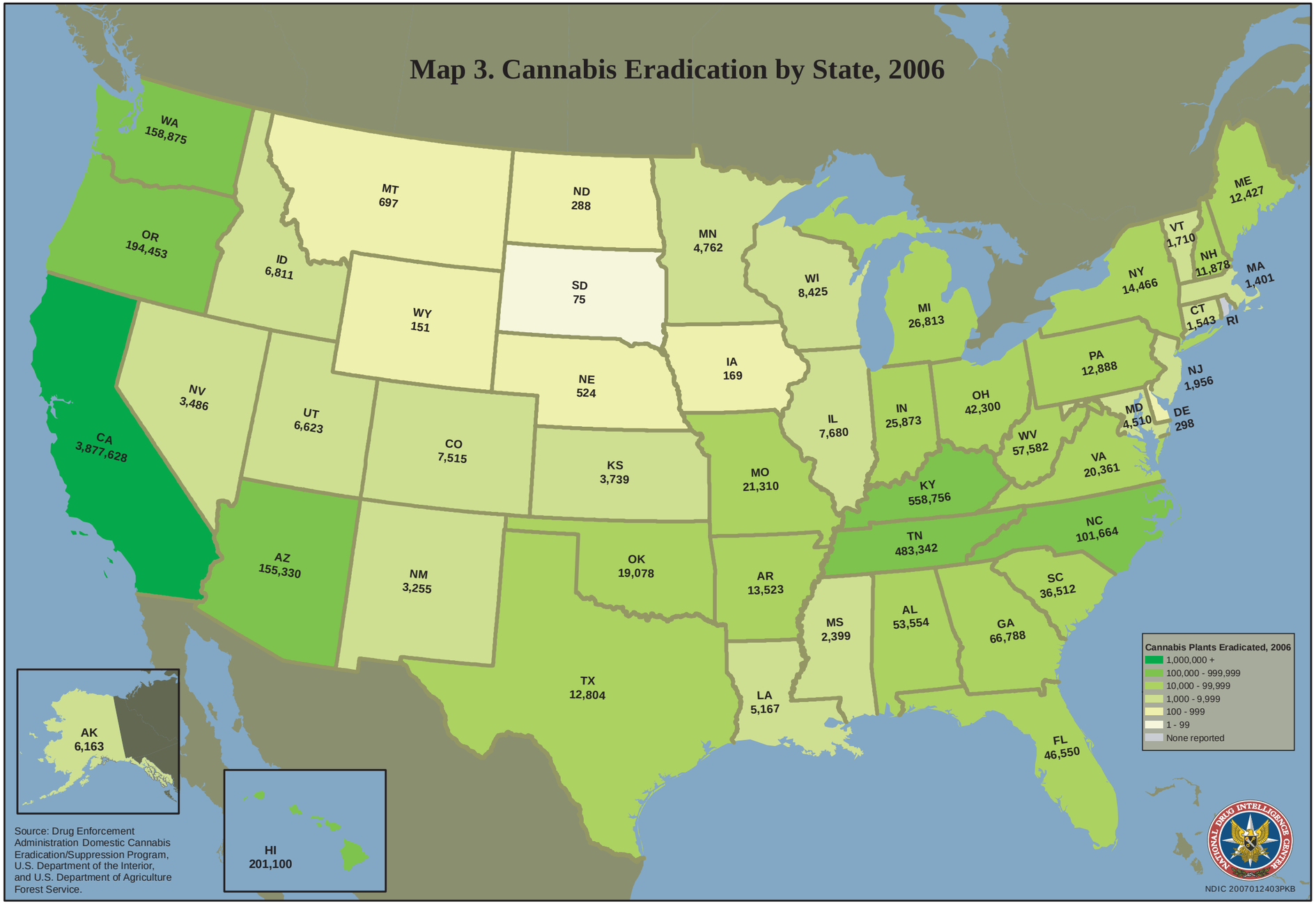

Map 3. Cannabis Eradication by State, 2006.

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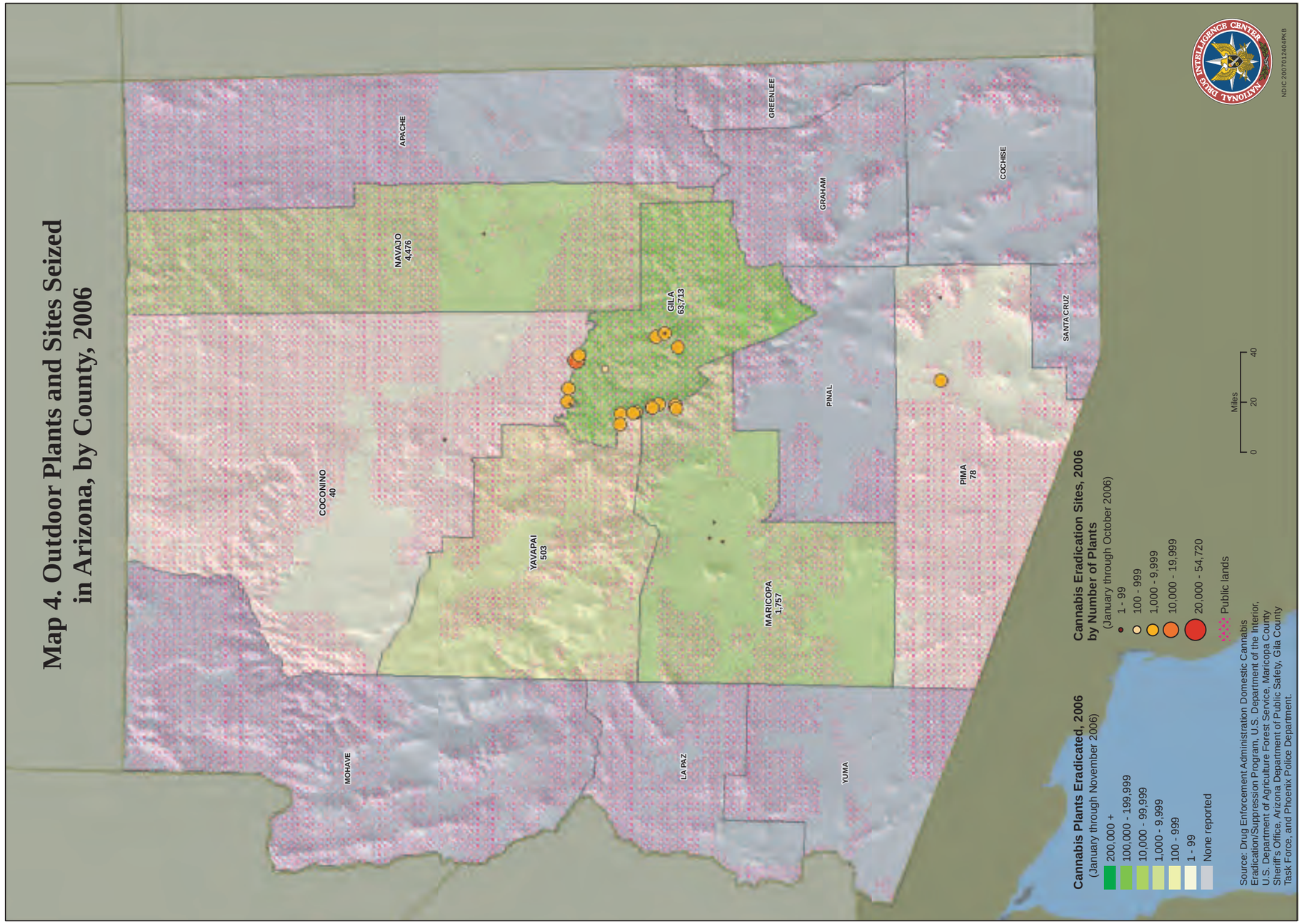

Map 4. Outdoor Plants and Sites Seized in Arizona, by County, 2006.

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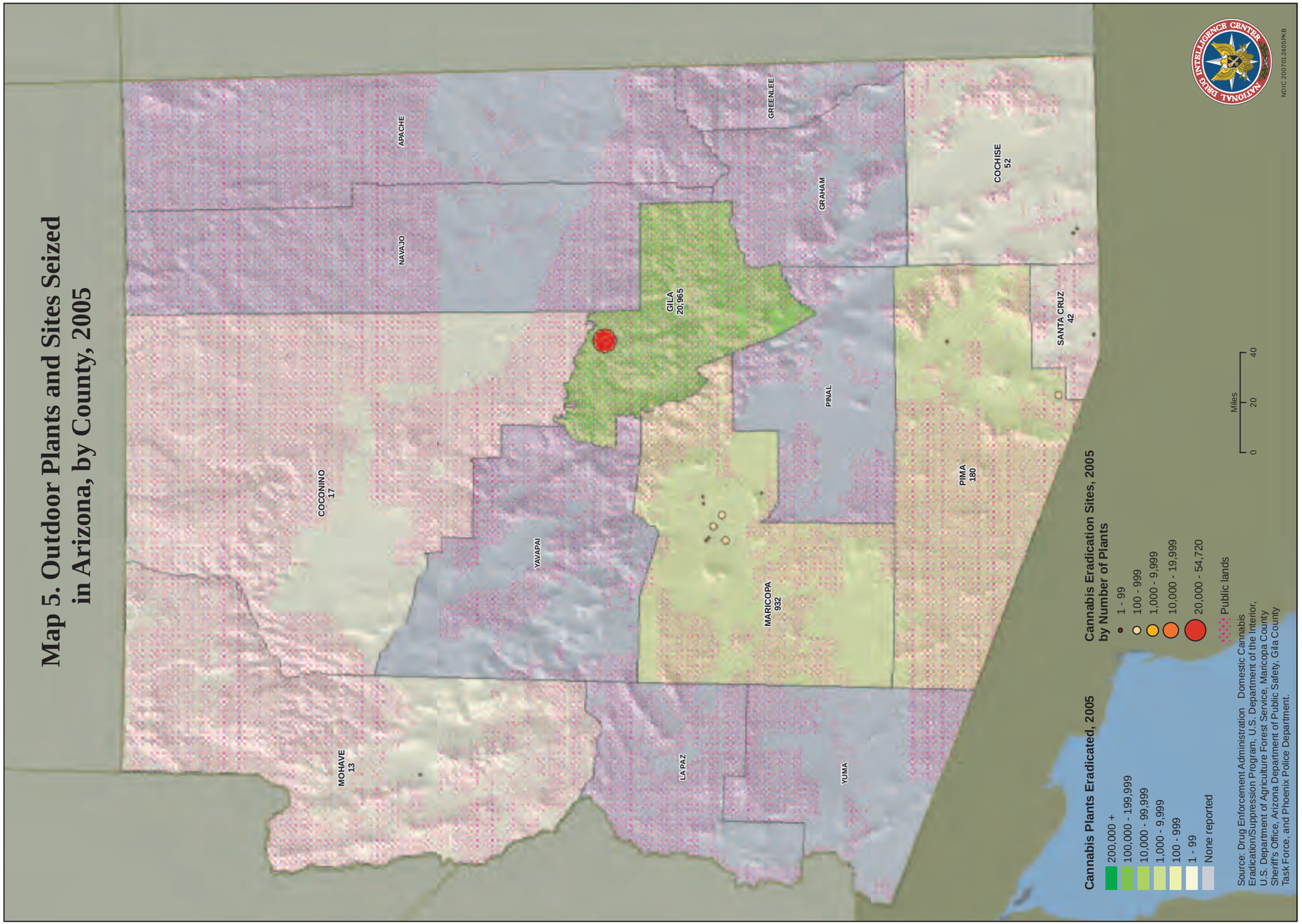

Map 5. Outdoor Plants and Sites Seized in Arizona, by County, 2005.

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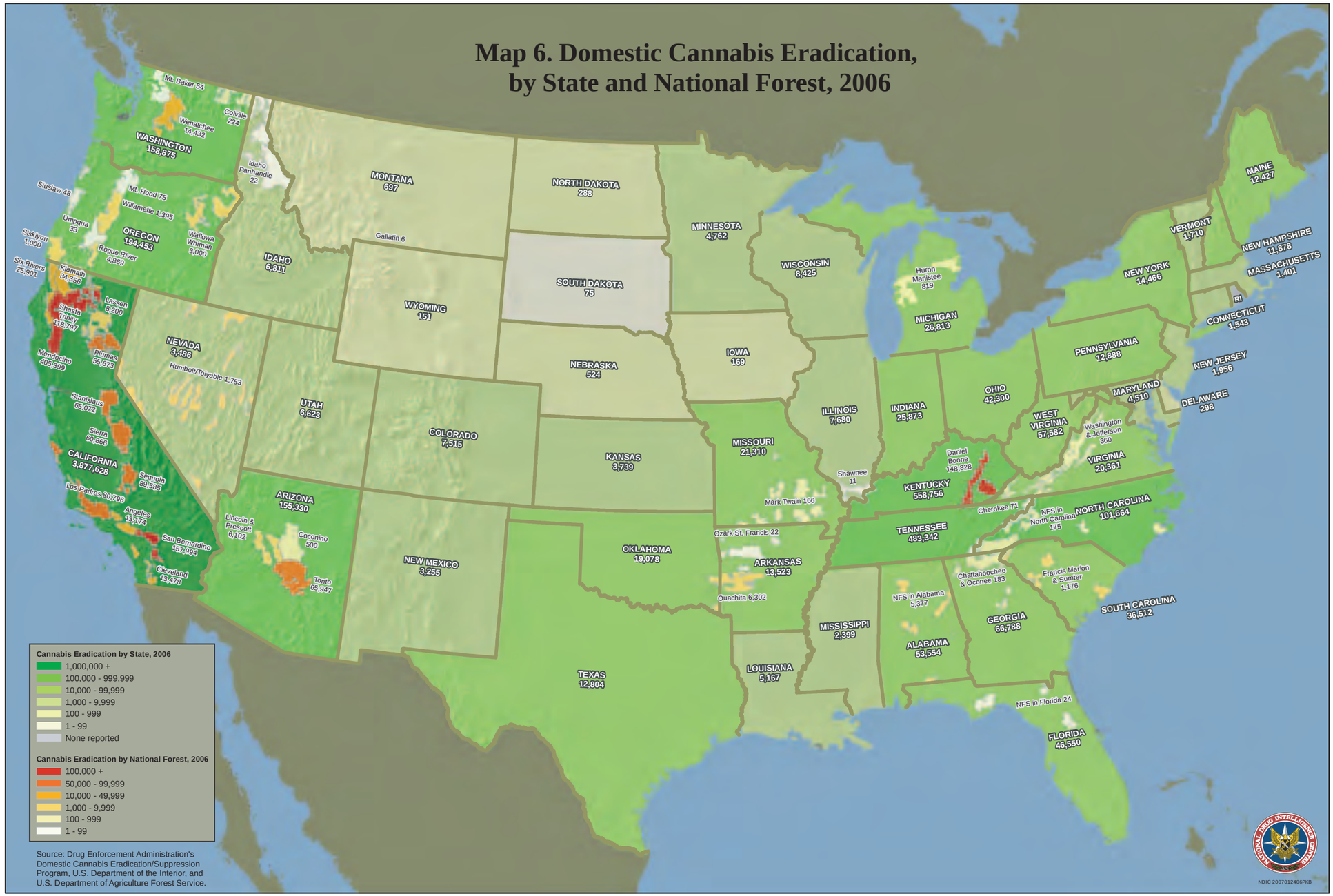

Map 6. Domestic Cannabis Eradication, by State and National Forest, 2006.

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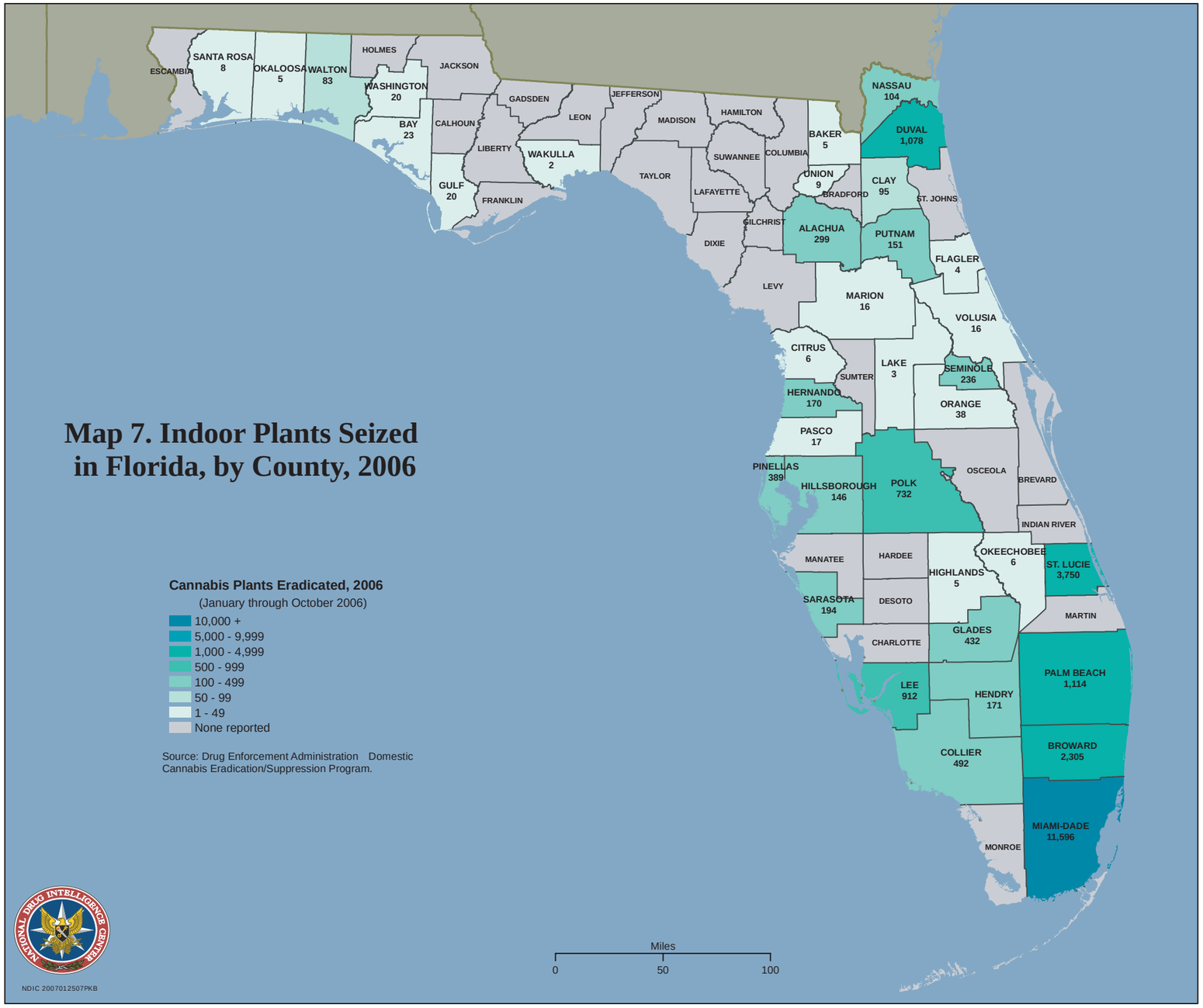

Map 7. Indoor Plants Seized in Florida, by County, 2006.

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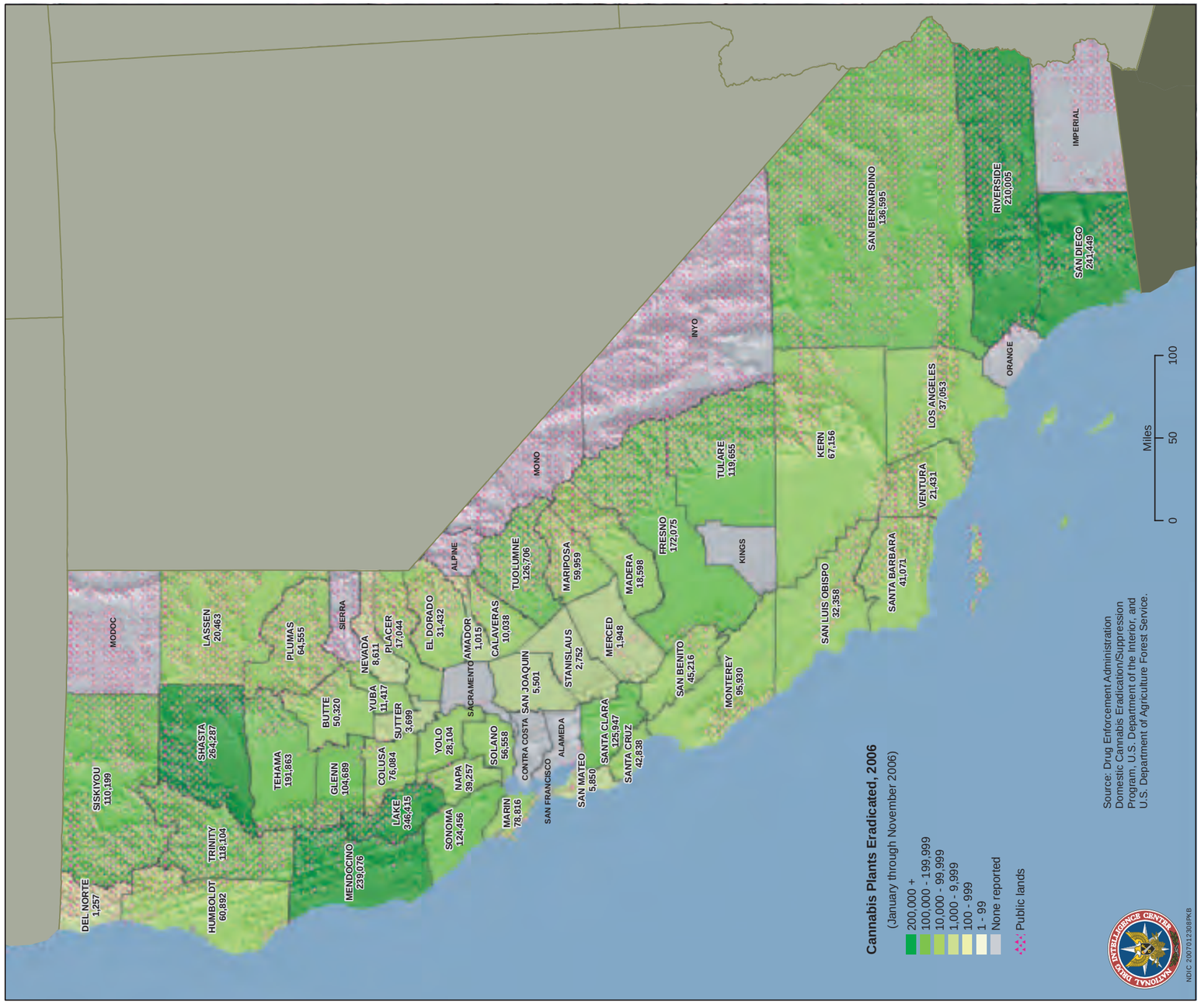

Map 8. Outdoor Plants Seized in California, by County, 2006.

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Map 9. Outdoor Plants and Sites Seized in California, by County, 2006.

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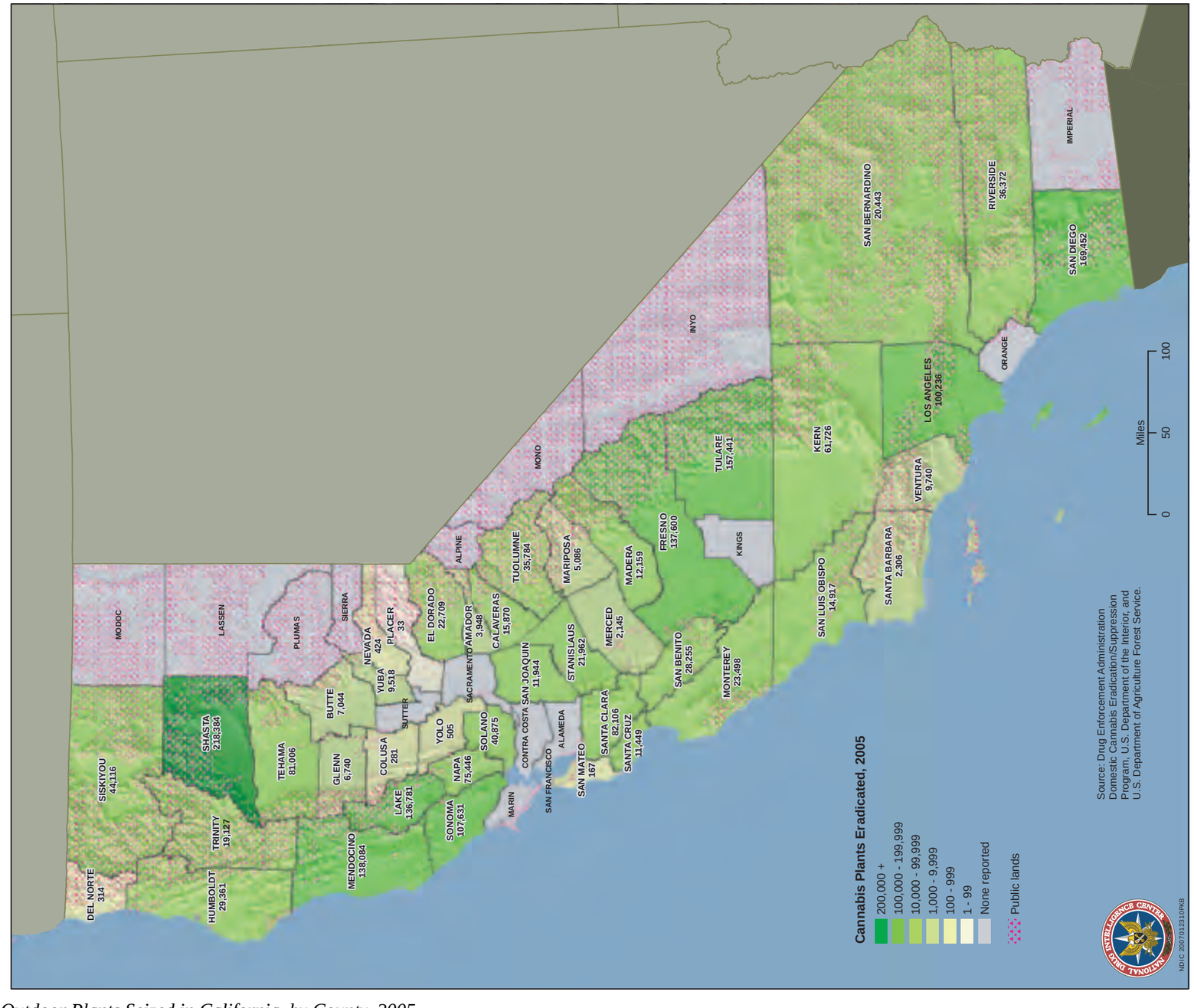
Map 10. Outdoor Plants Seized in California, by County, 2005



Map 10. Outdoor Plants Seized in California, by County, 2005.

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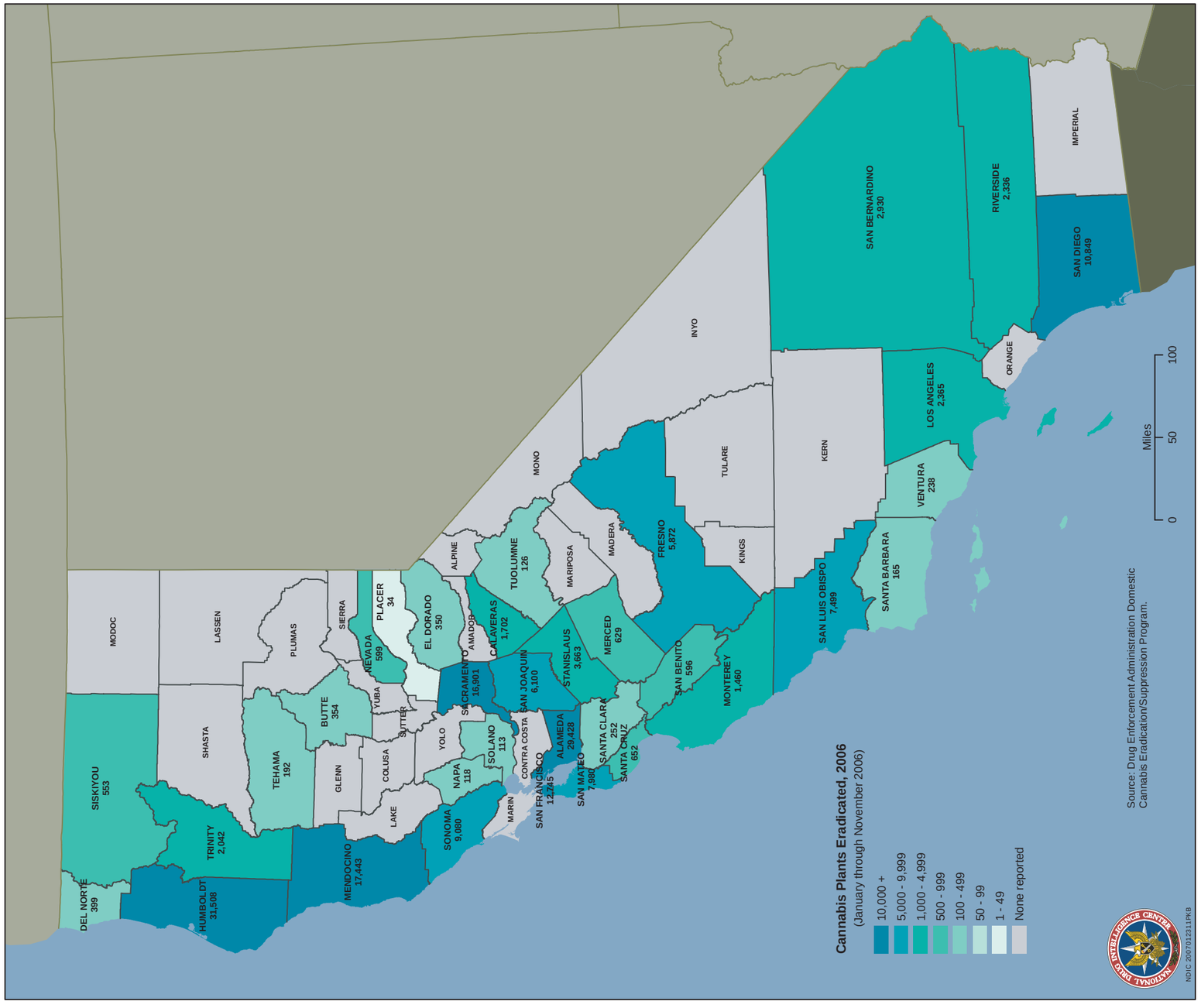
Map 11. Indoor Plants Seized in California, by County, 2006



Map 11. Indoor Plants Seized in California, by County, 2006.

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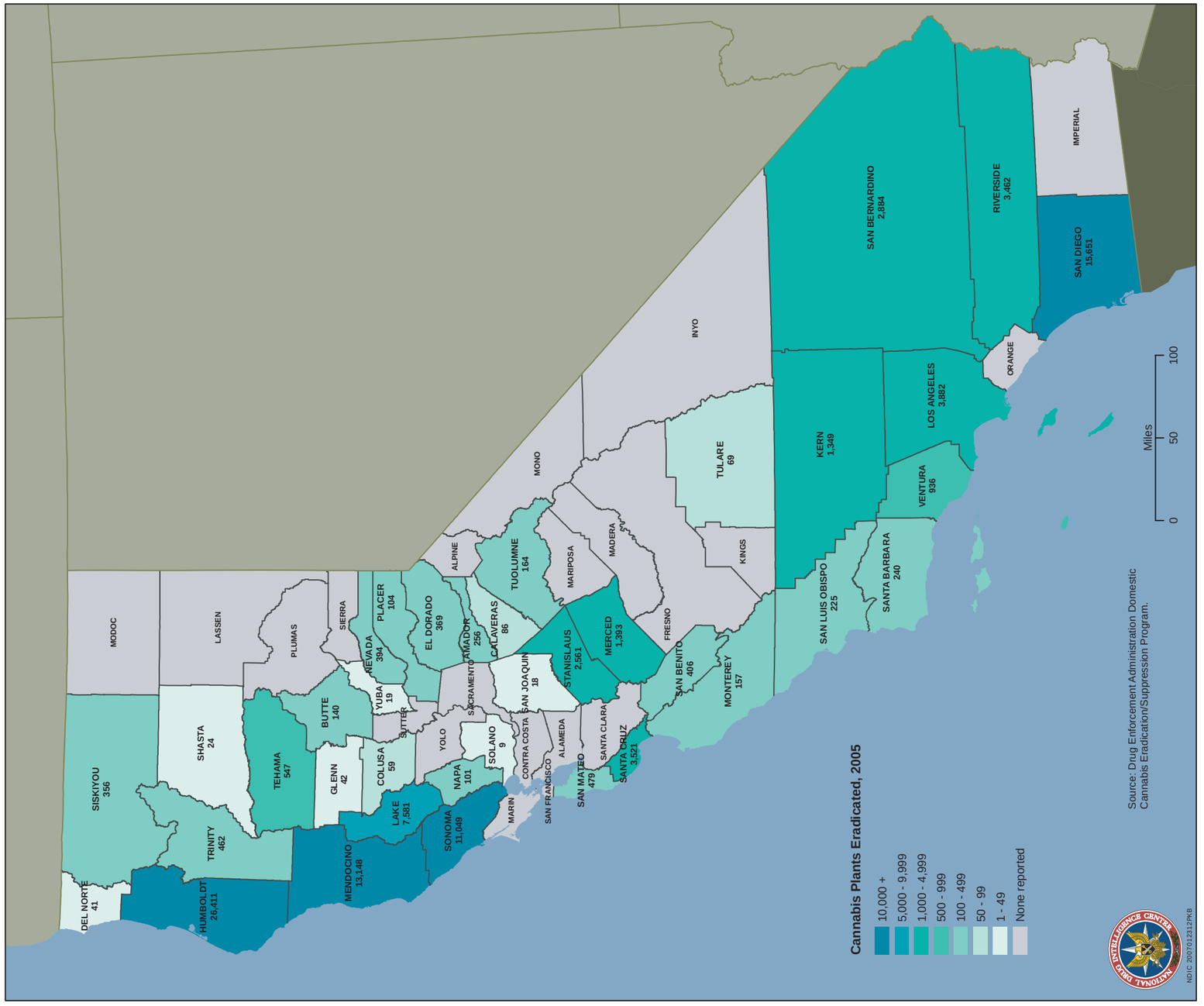
Map 12. Indoor Plants Seized in California, by County, 2005



Map 12. Indoor Plants Seized in California, by County, 2005.

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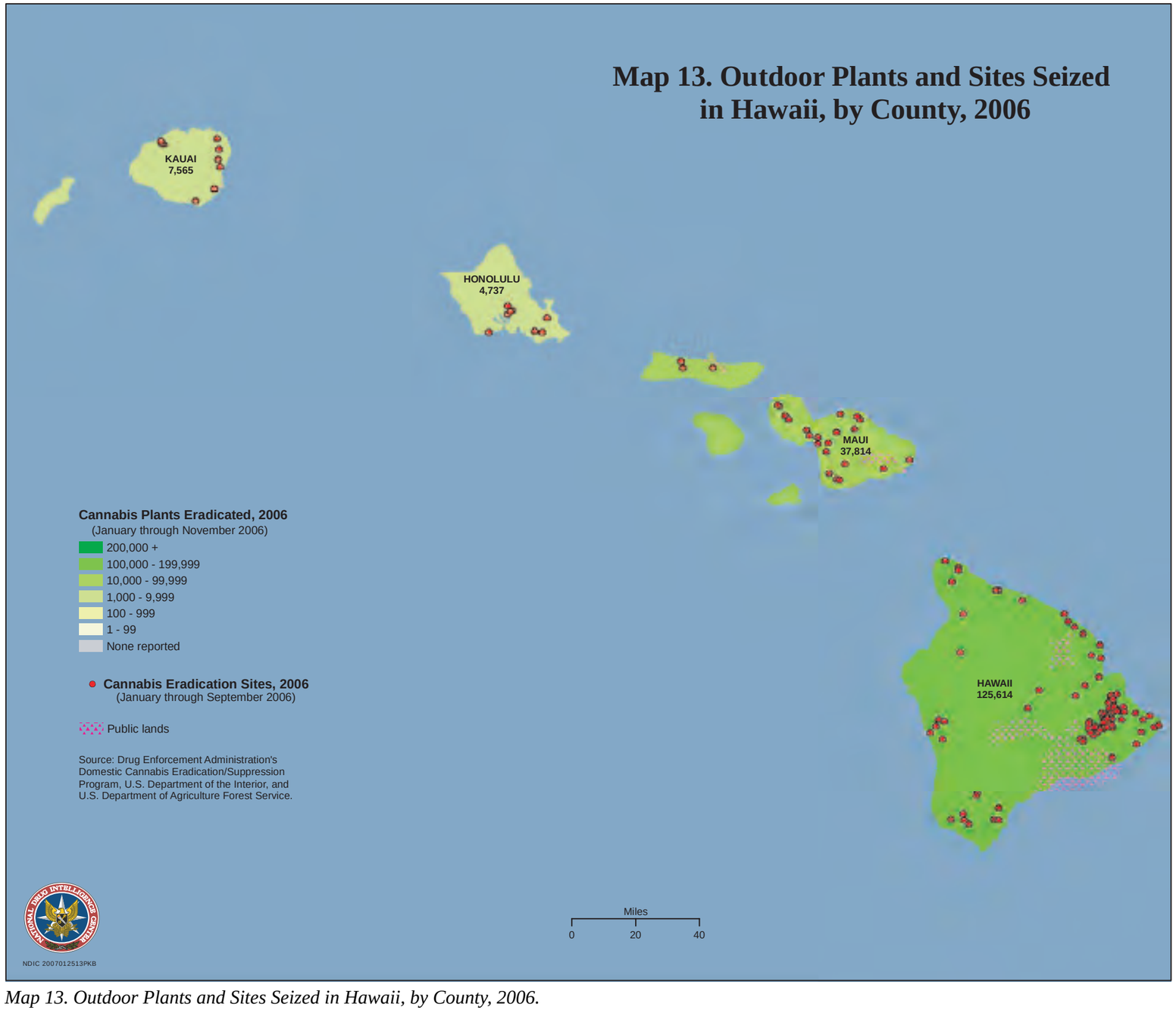

Map 13. Outdoor Plants and Sites Seized in Hawaii, by County, 2006.

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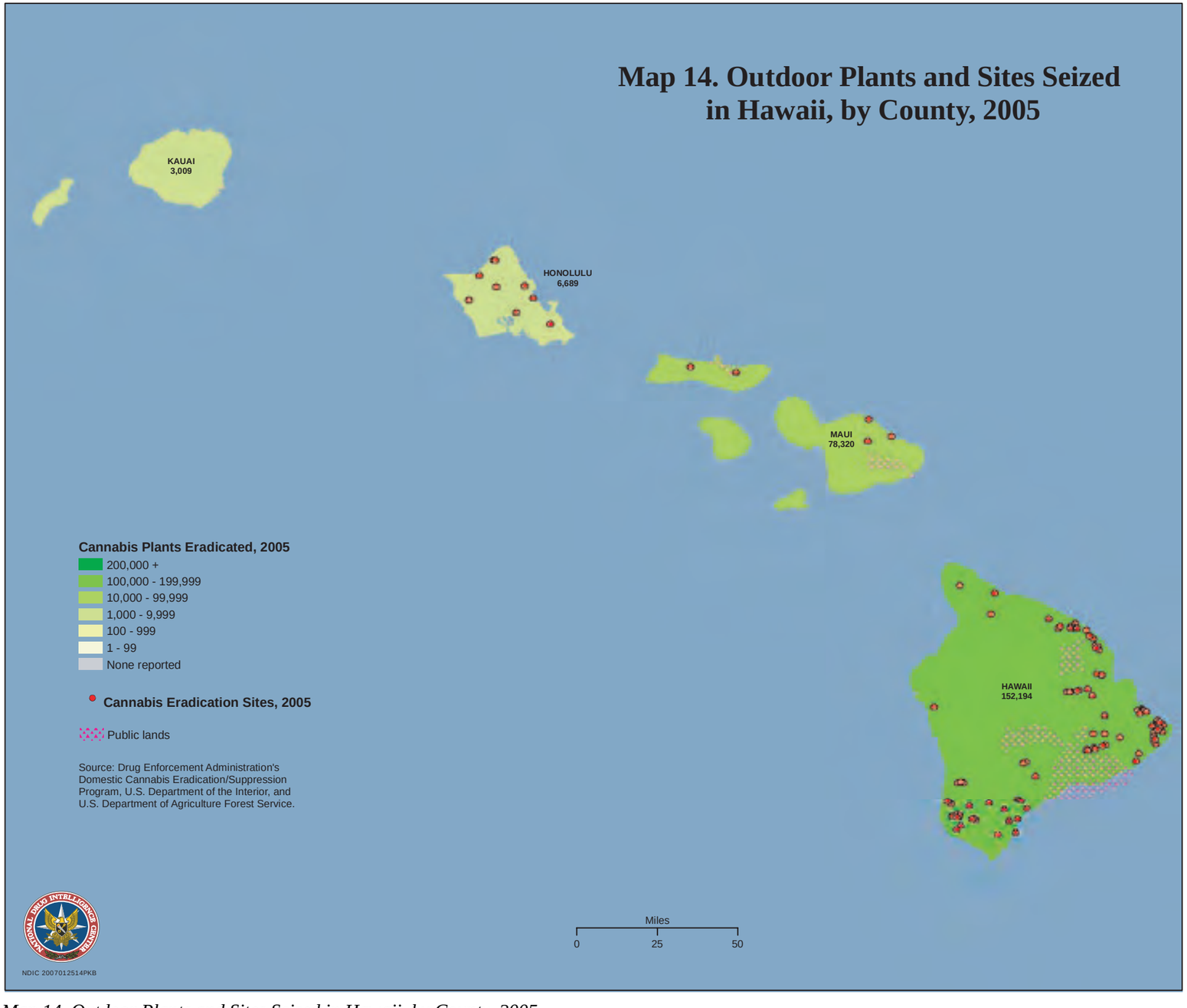

Map 14. Outdoor Plants and Sites Seized in Hawaii, by County, 2005.

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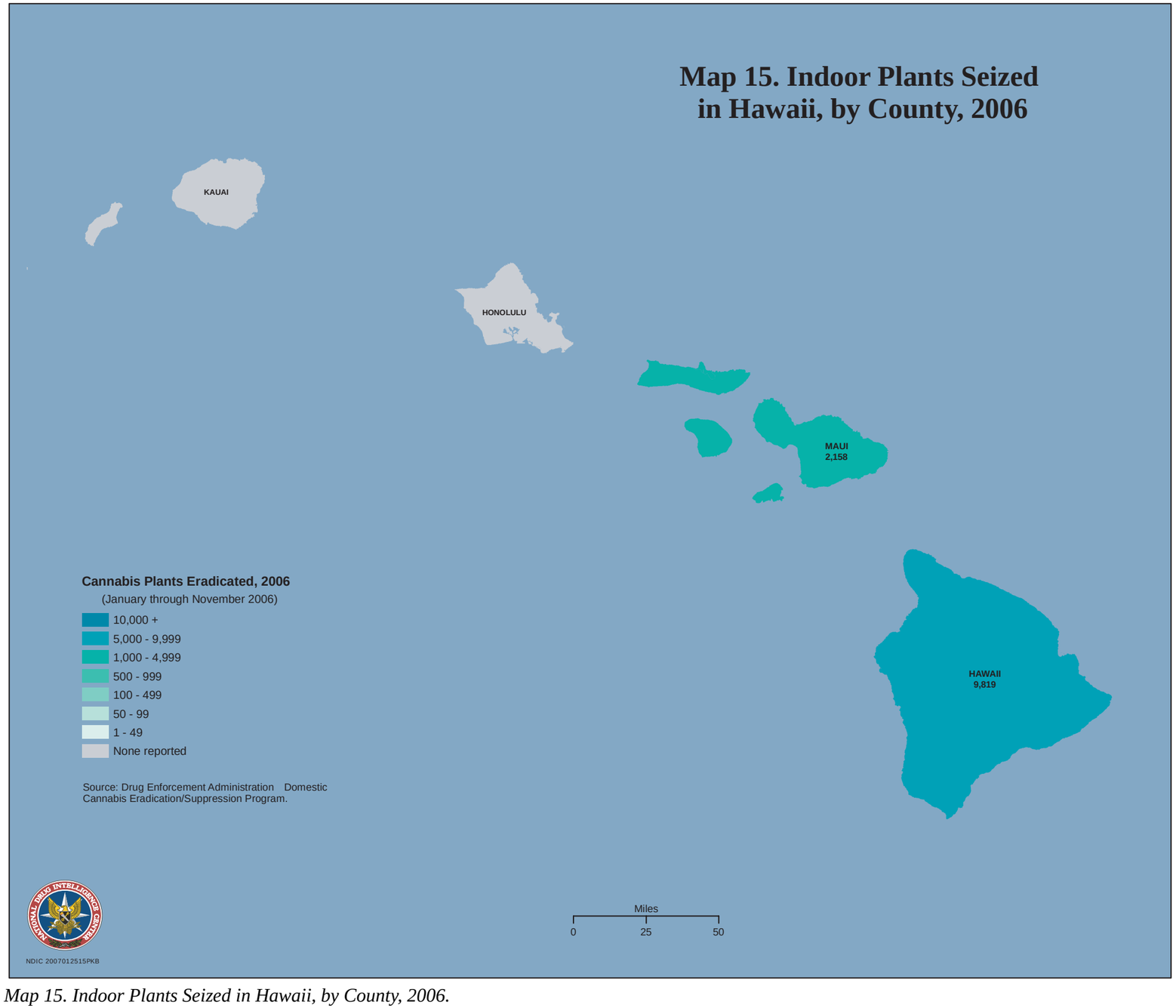

Map 15. Indoor Plants Seized in Hawaii, by County, 2006.

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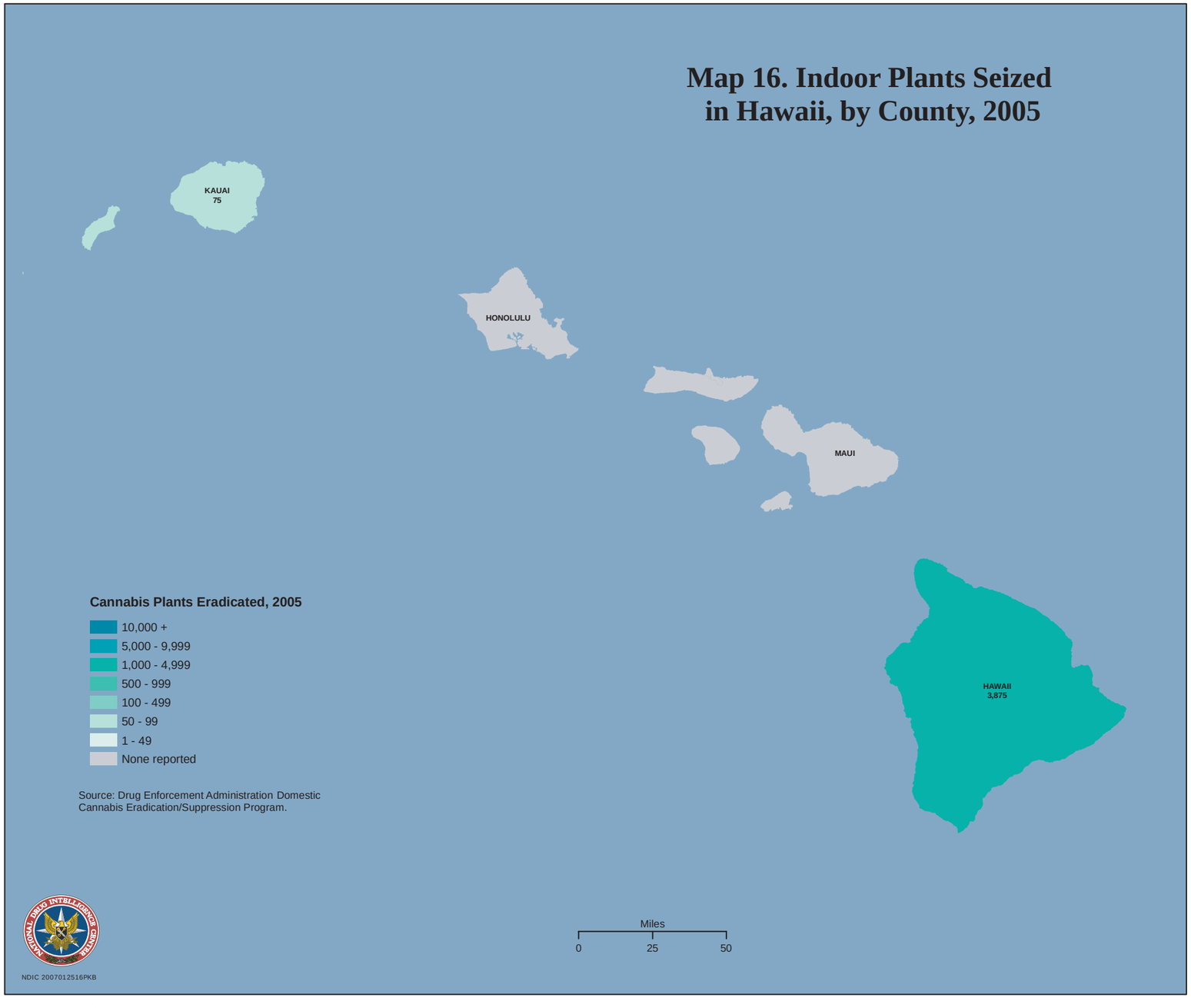

Map 16. Indoor Plants Seized in Hawaii, by County, 2005.

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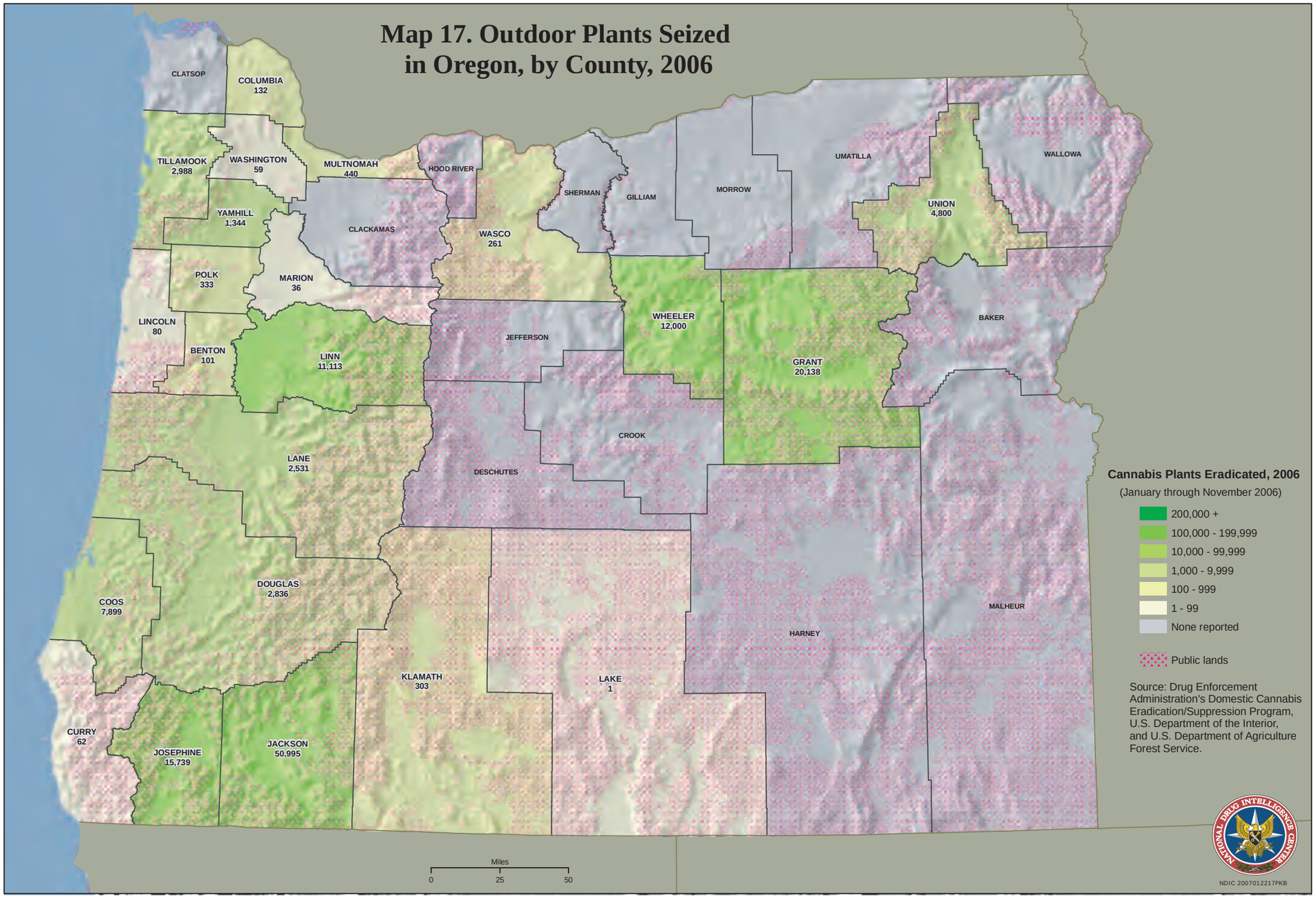

Map 17. Outdoor Plants Seized in Oregon, by County, 2006.

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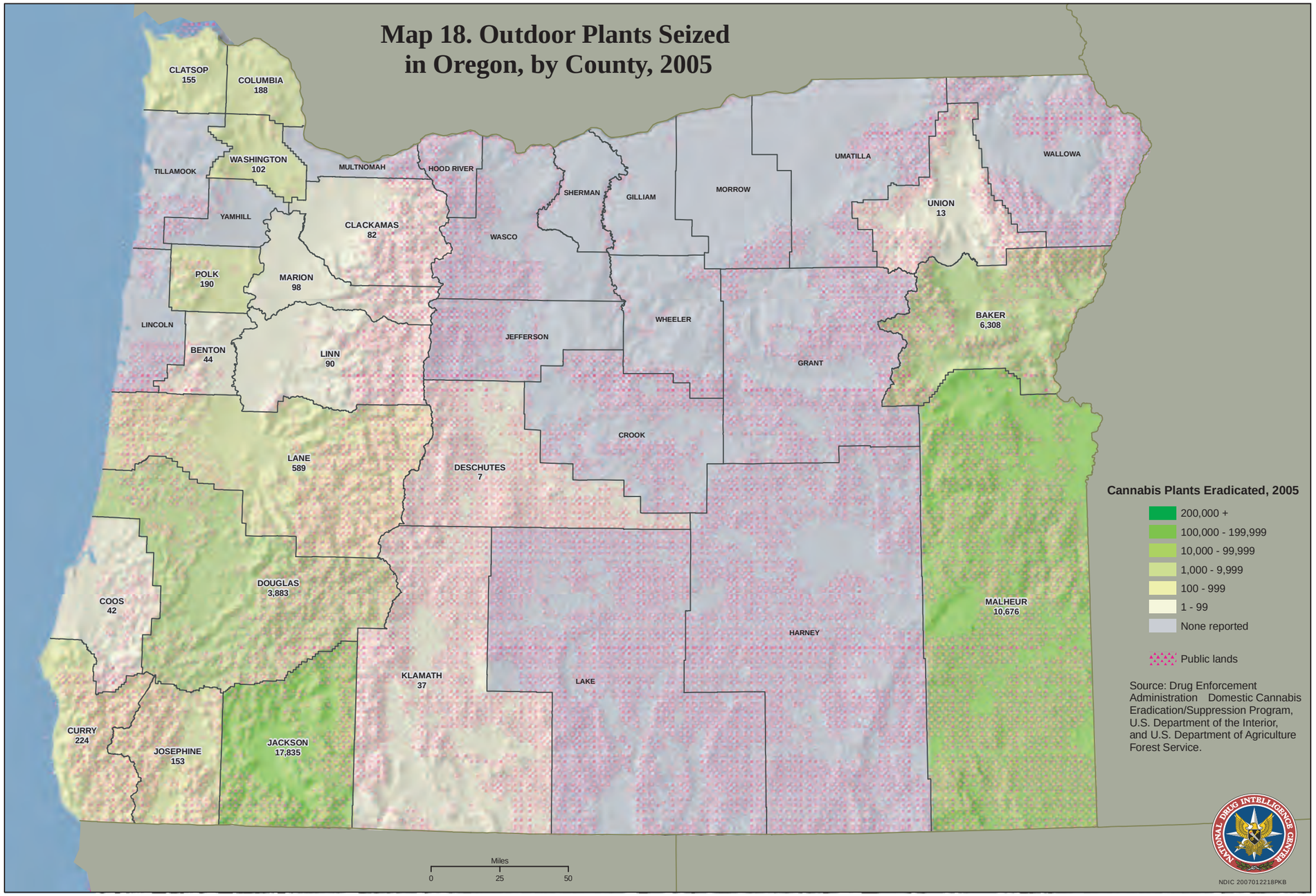

Map 18. Outdoor Plants Seized in Oregon, by County, 2005.

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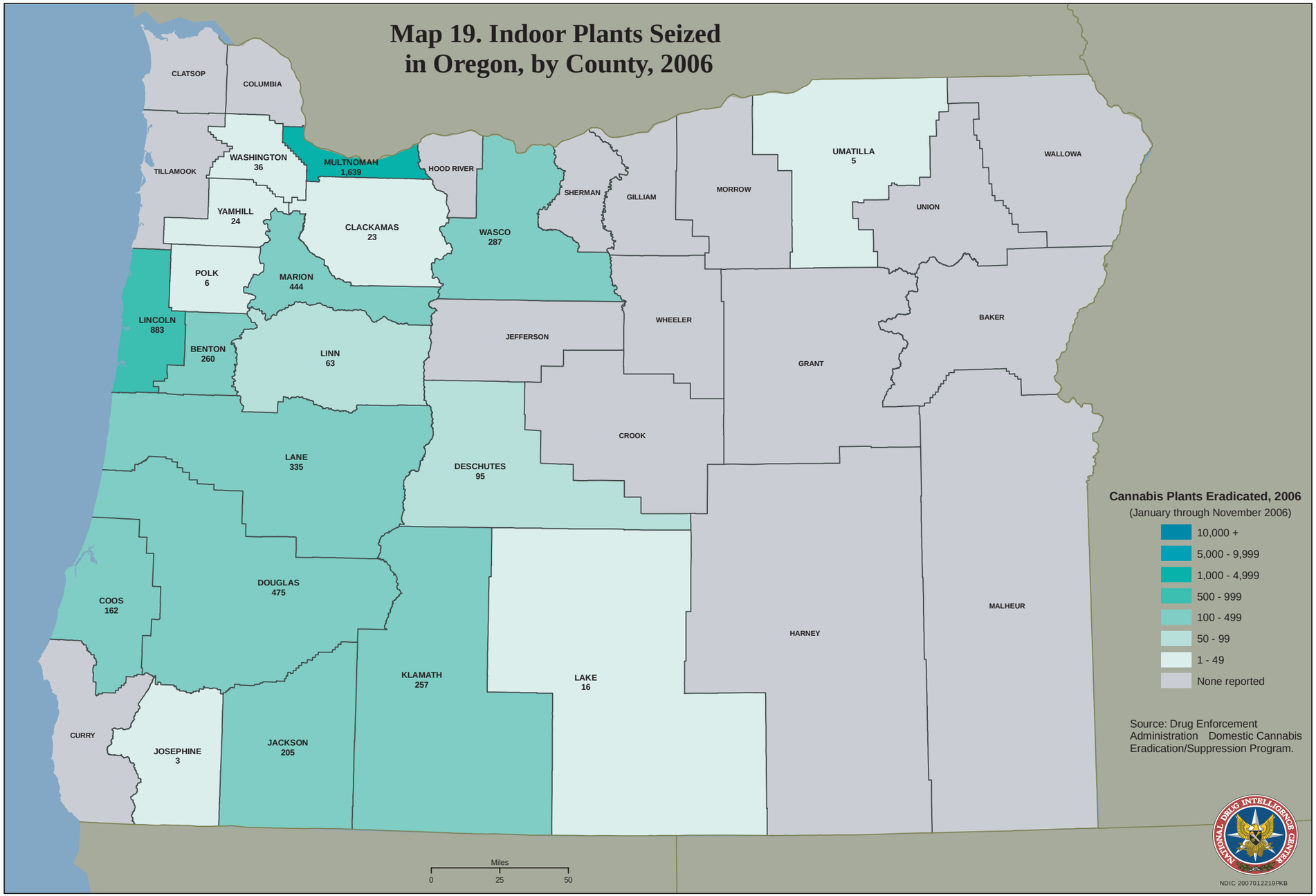

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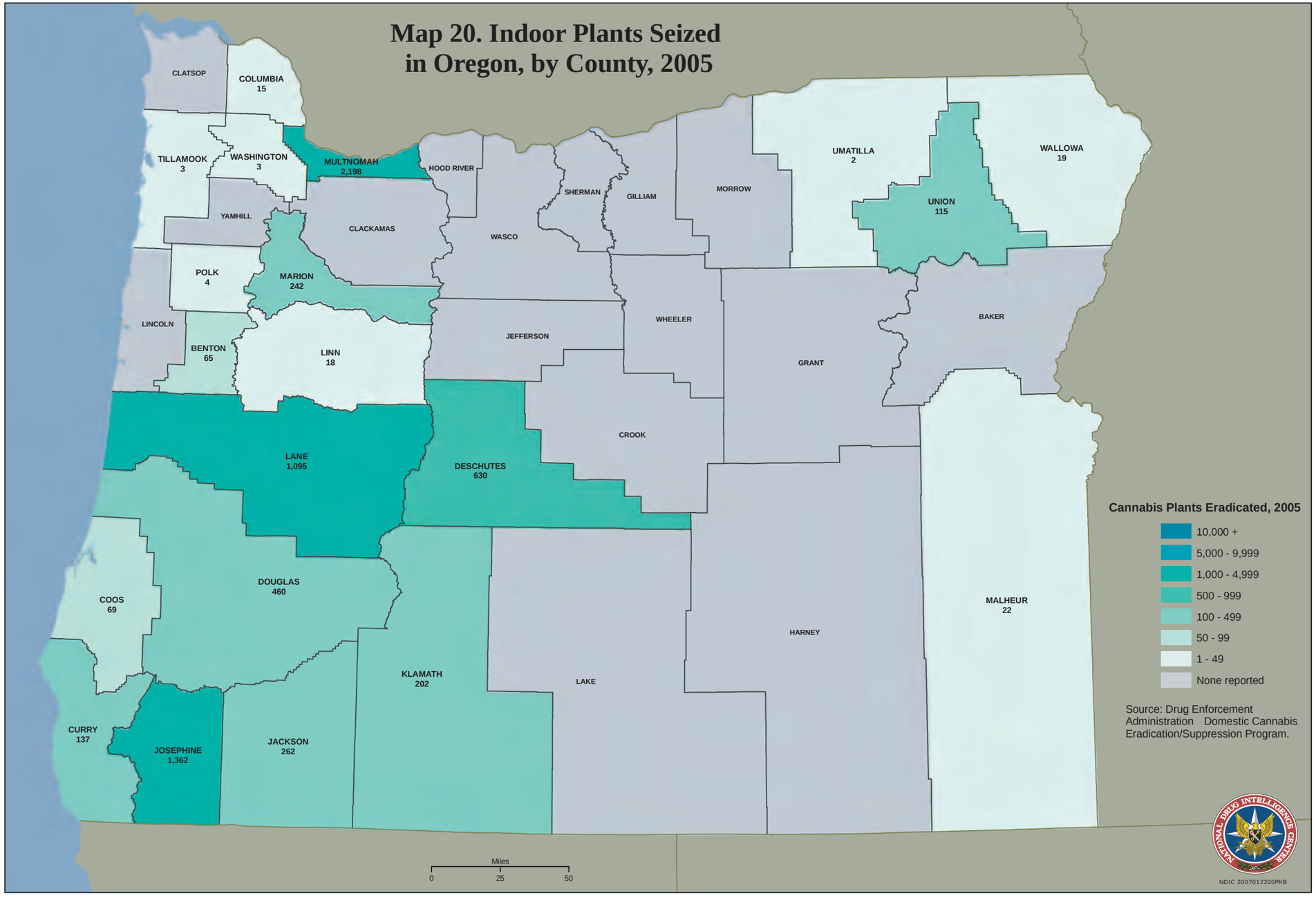

Map 20. Indoor Plants Seized in Oregon, by County, 2005.

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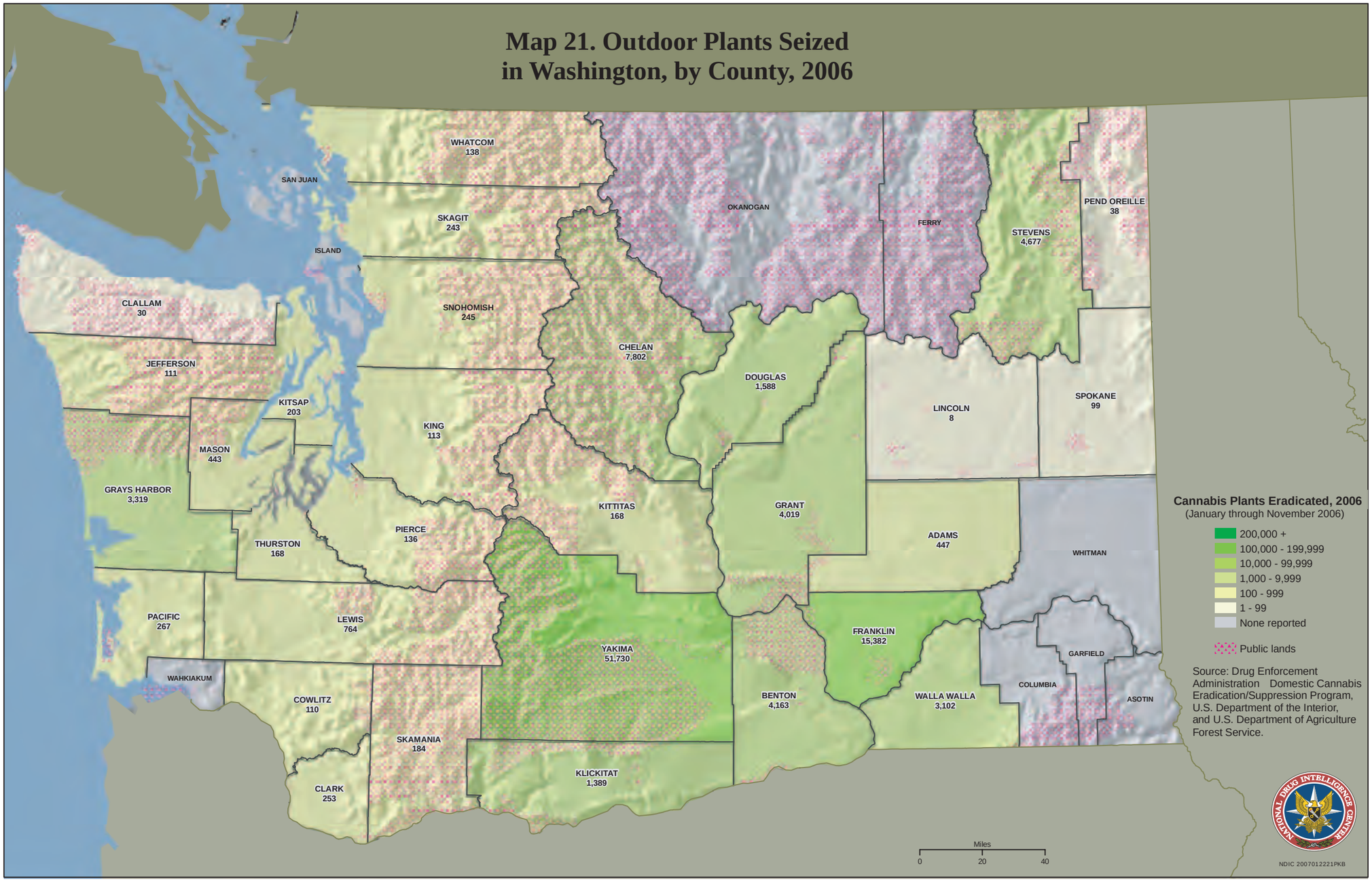

Map 21. Outdoor Plants Seized in Washington, by County, 2006.

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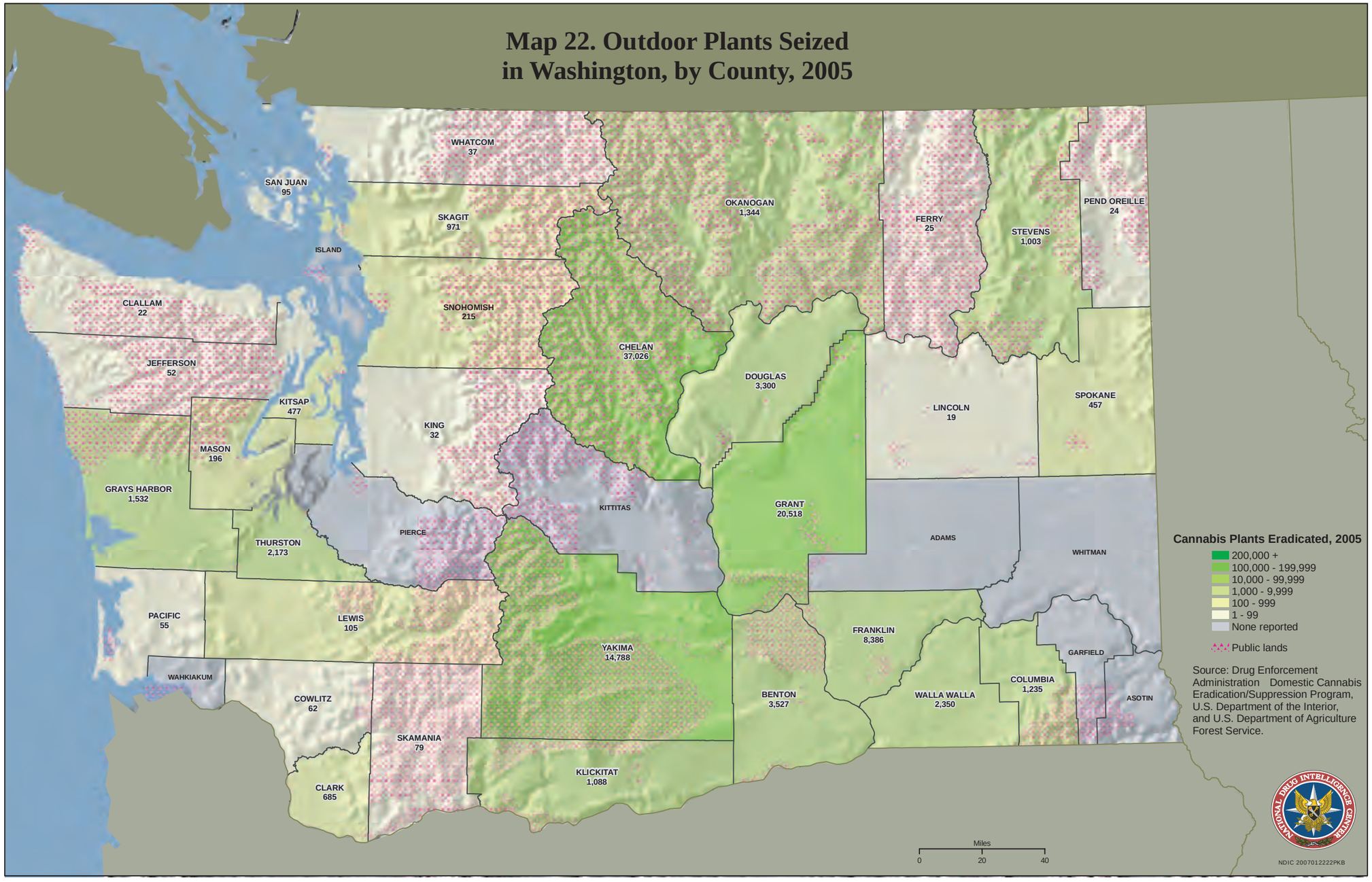

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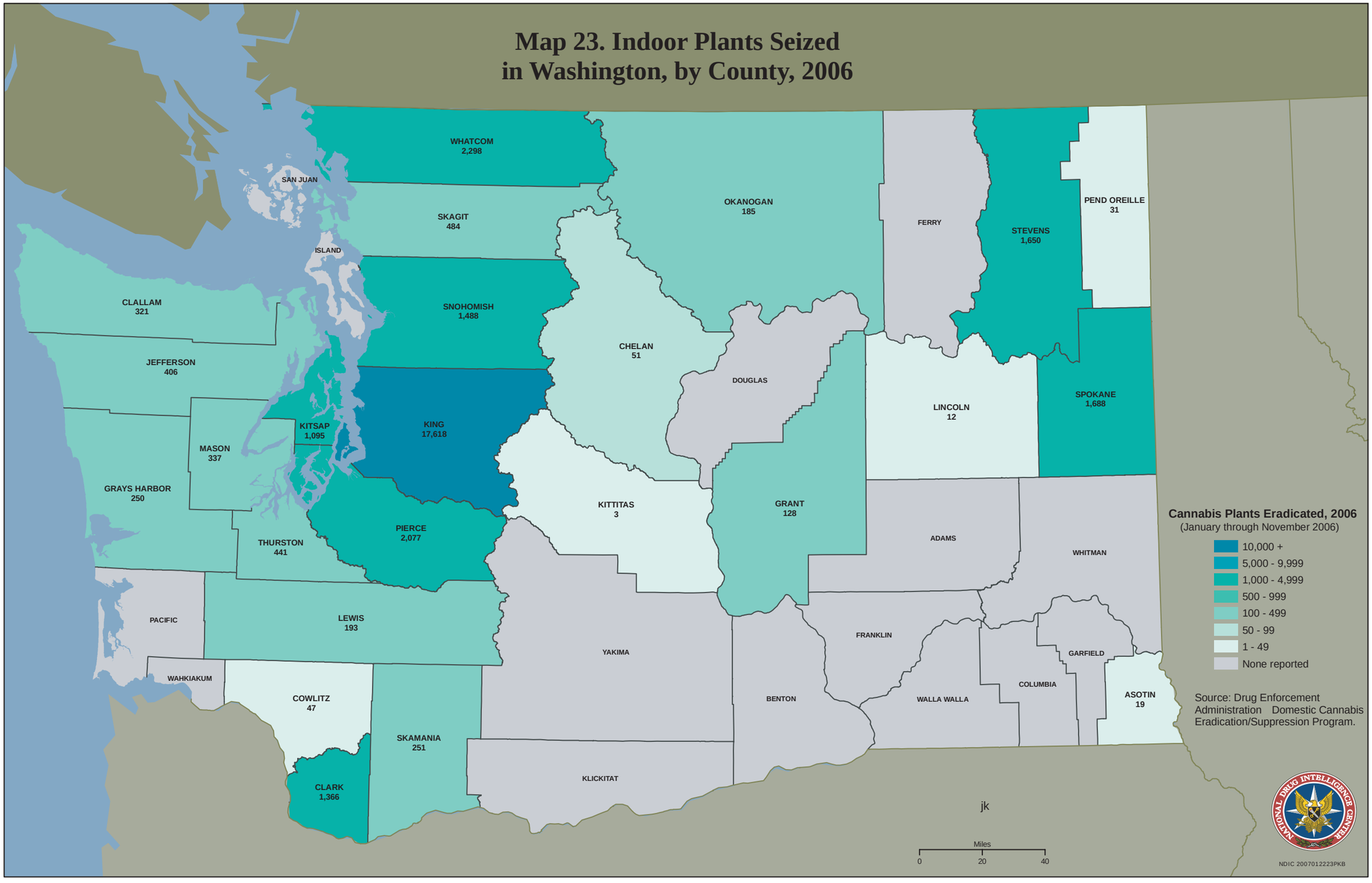

Map 23. Indoor Plants Seized in Washington, by County, 2006.

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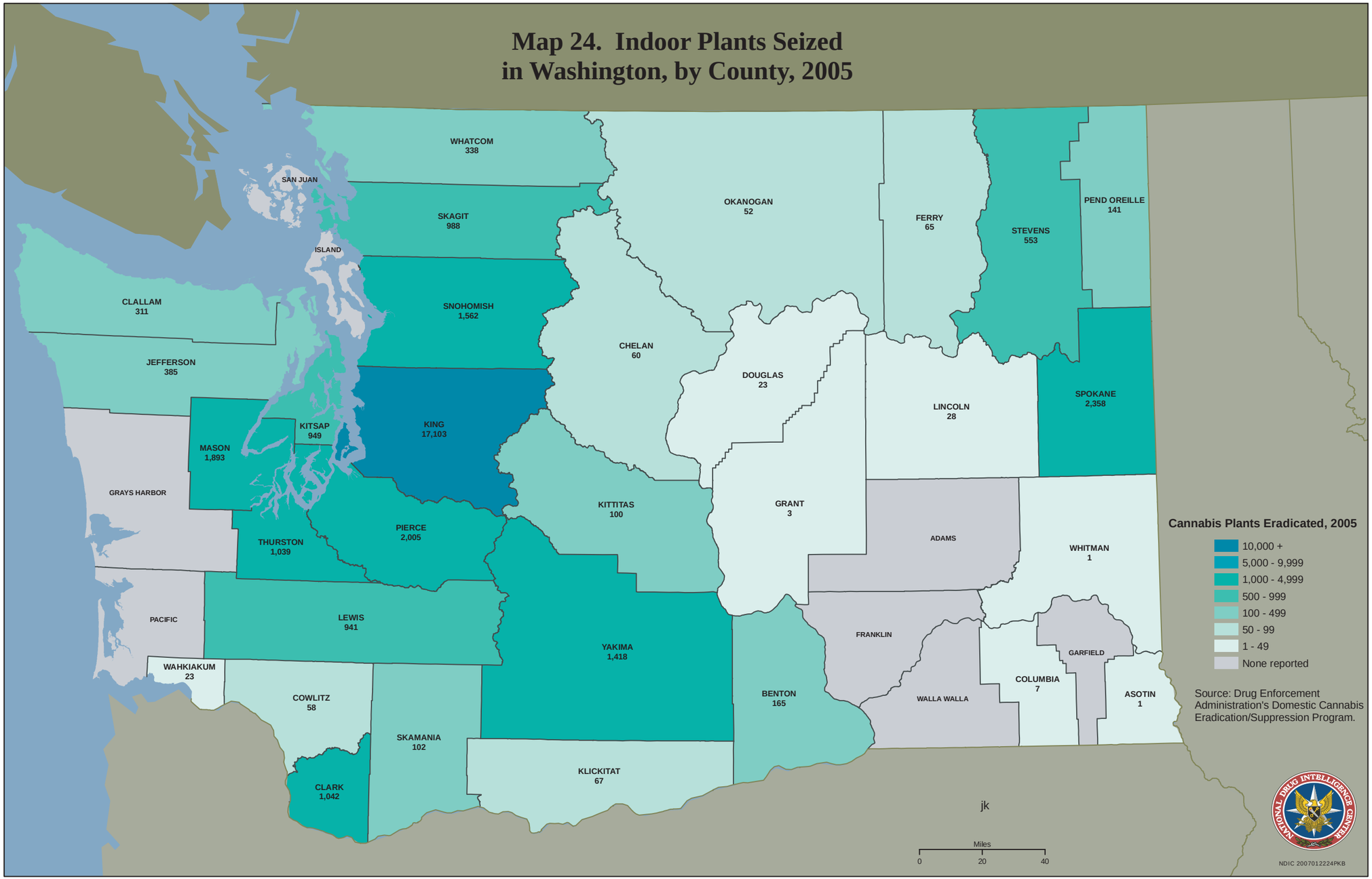

Map 24. Indoor Plants Seized in Washington, by County, 2005.

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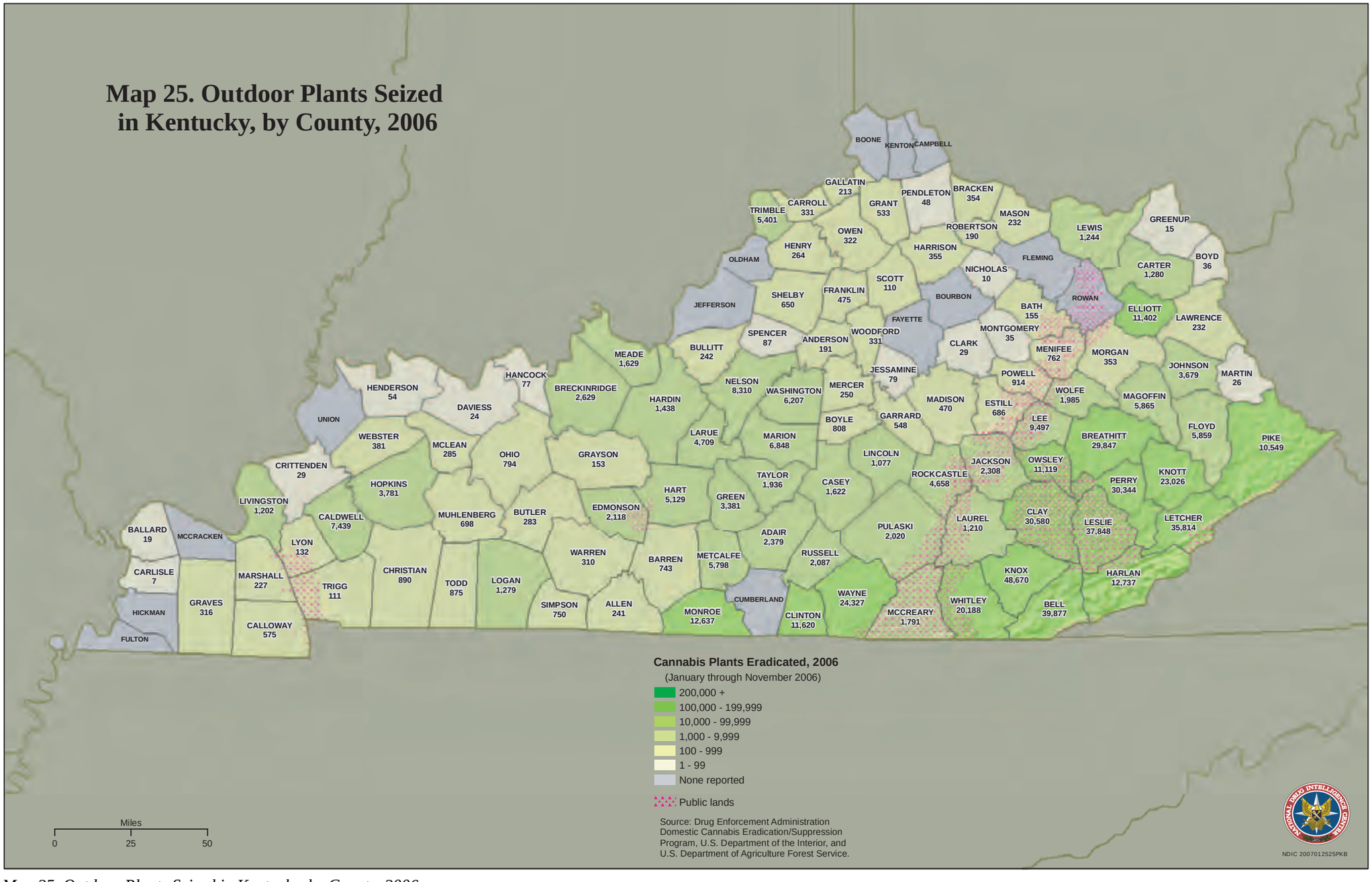

Map 25. Outdoor Plants Seized in Kentucky, by County, 2006.

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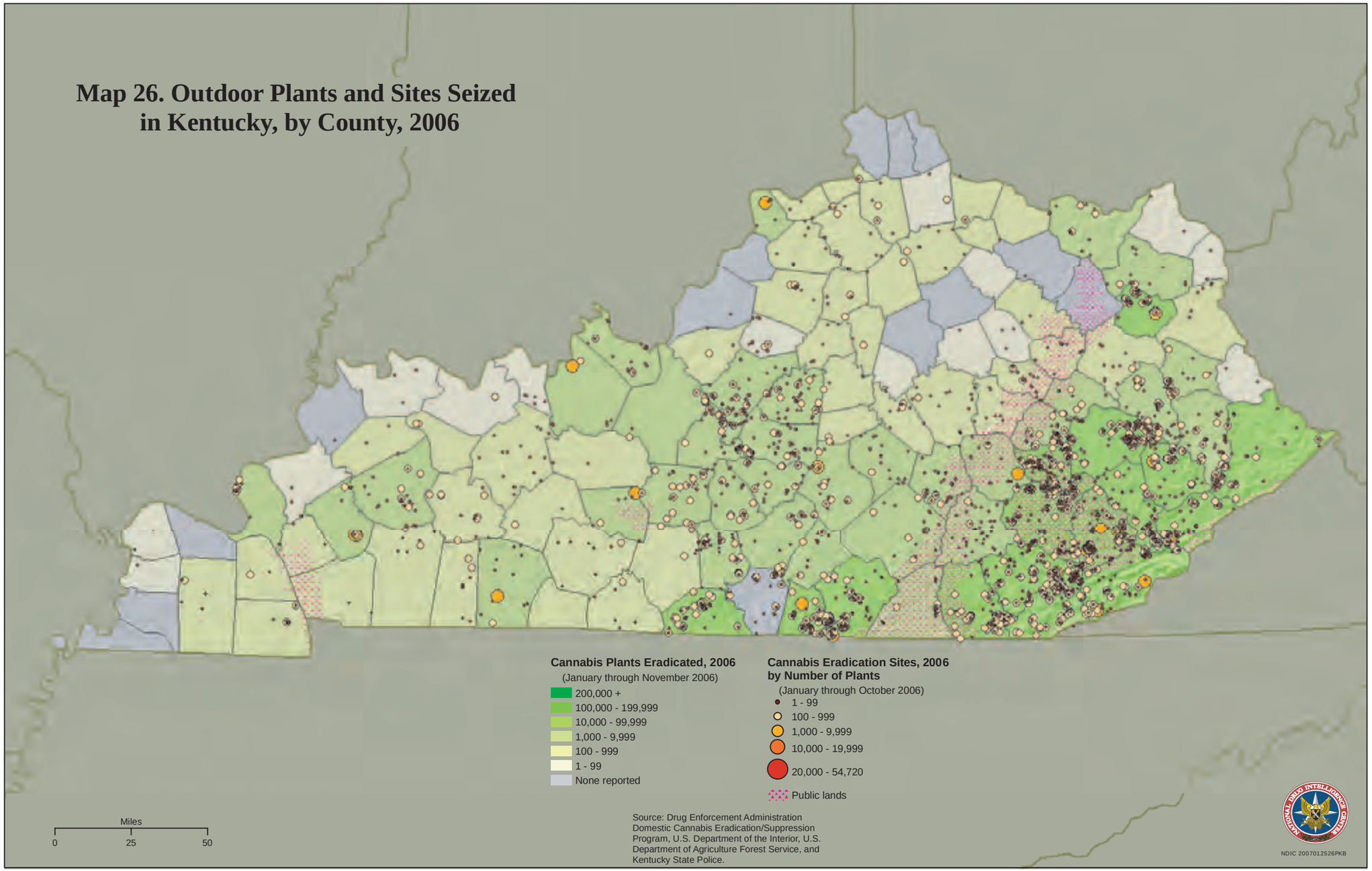

Map 26. Outdoor Plants and Sites Seized in Kentucky, by County, 2006.

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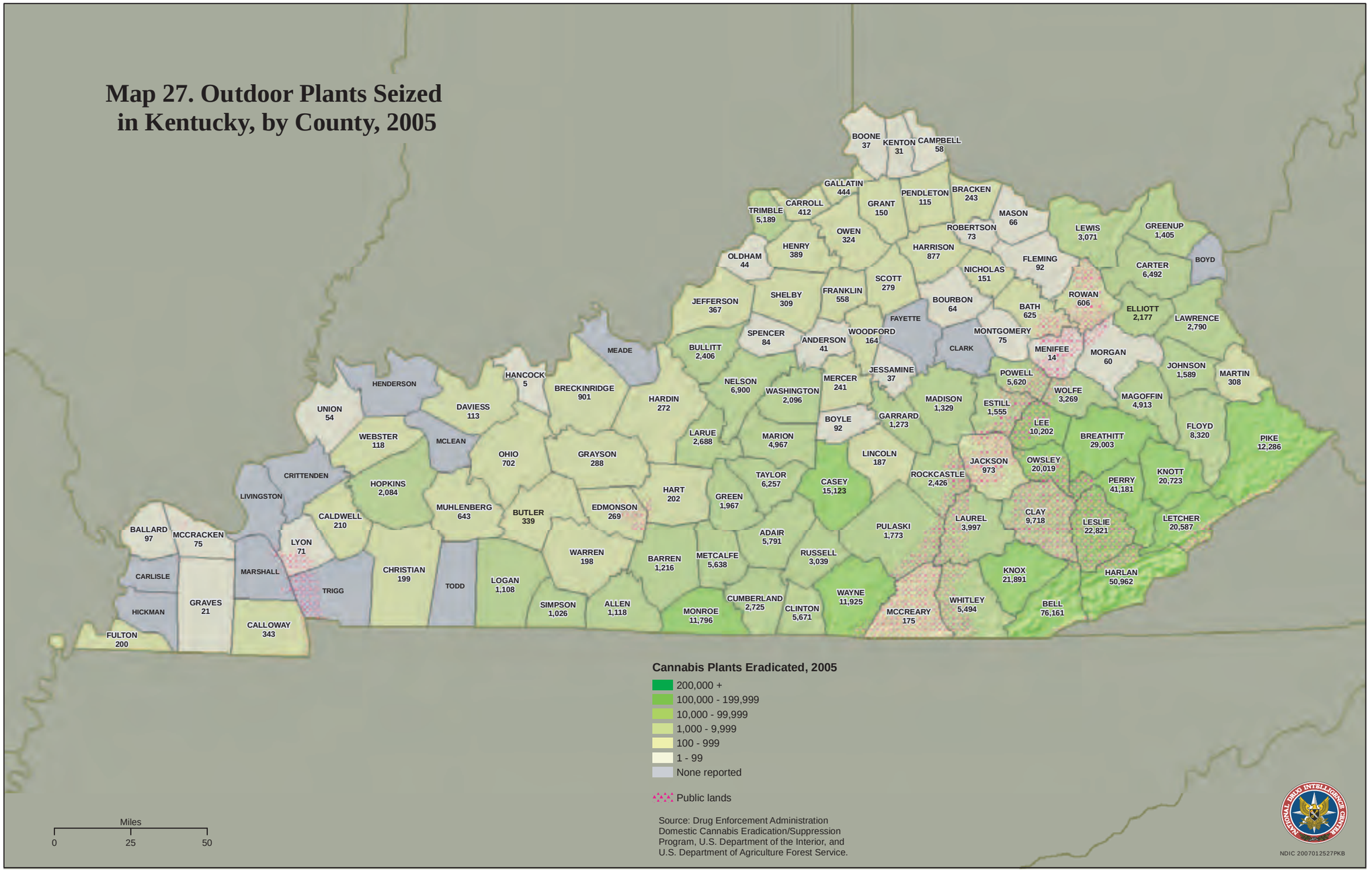

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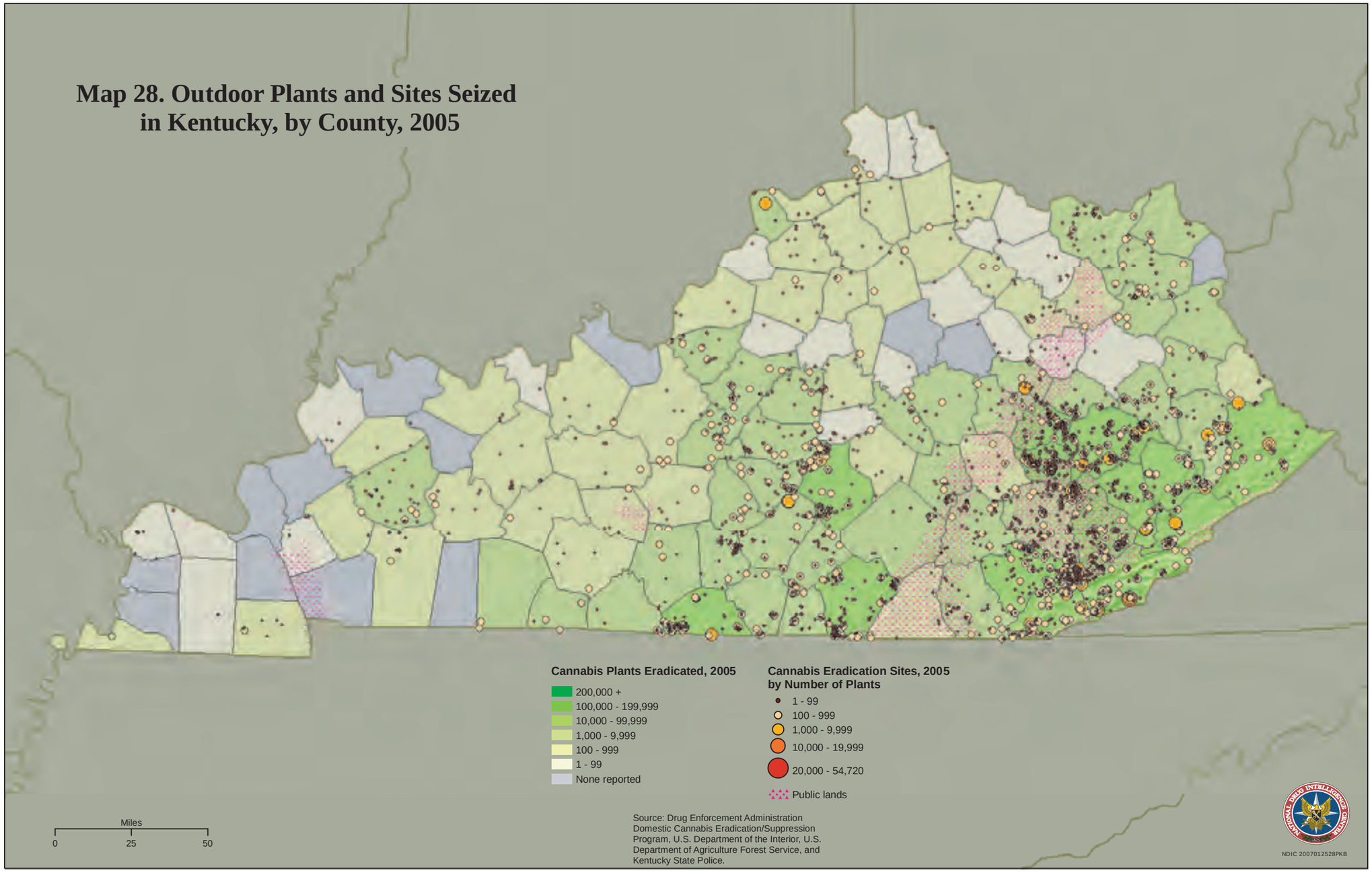

Map 28. Outdoor Plants and Sites Seized in Kentucky, by County, 2005.

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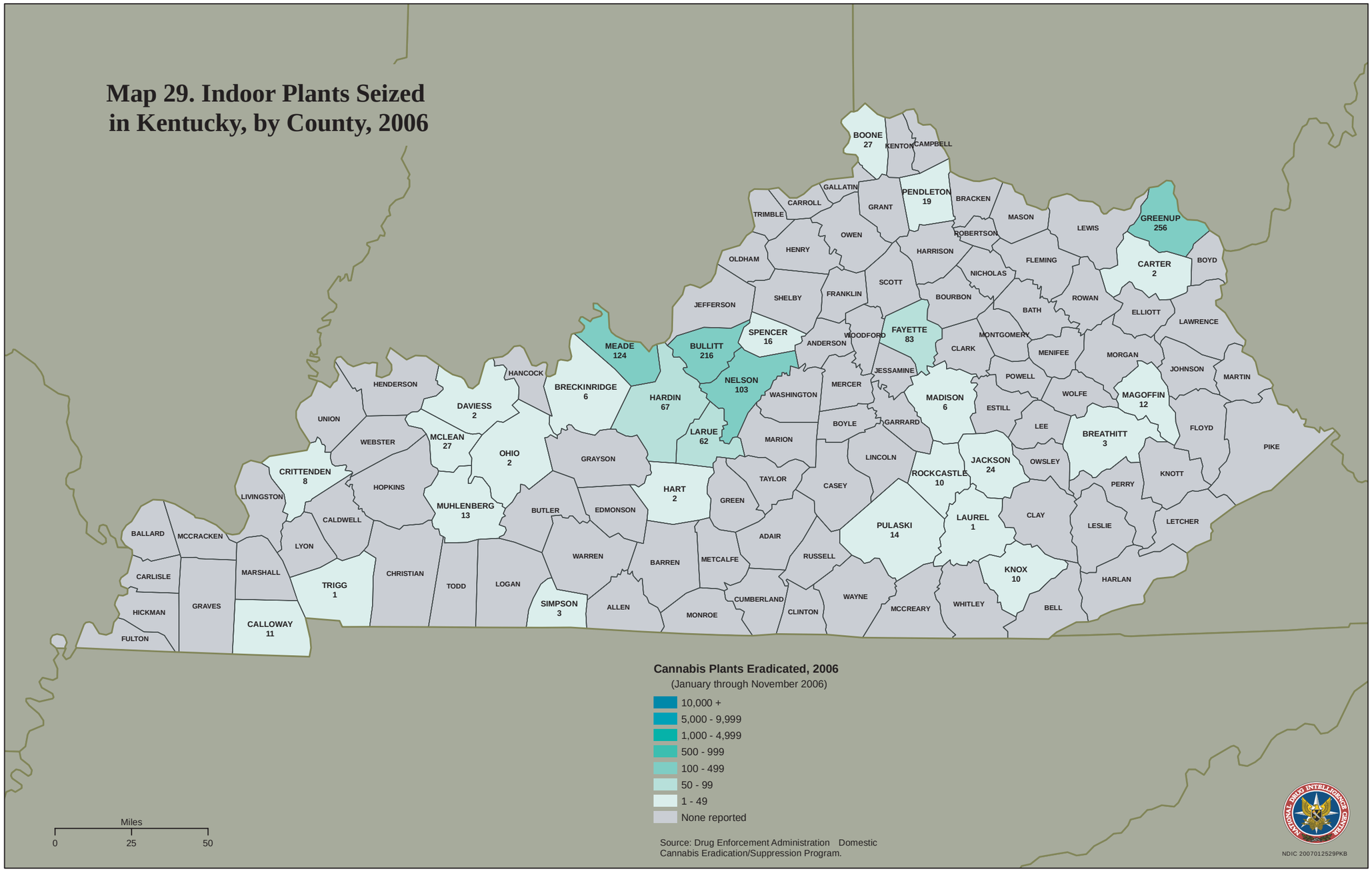

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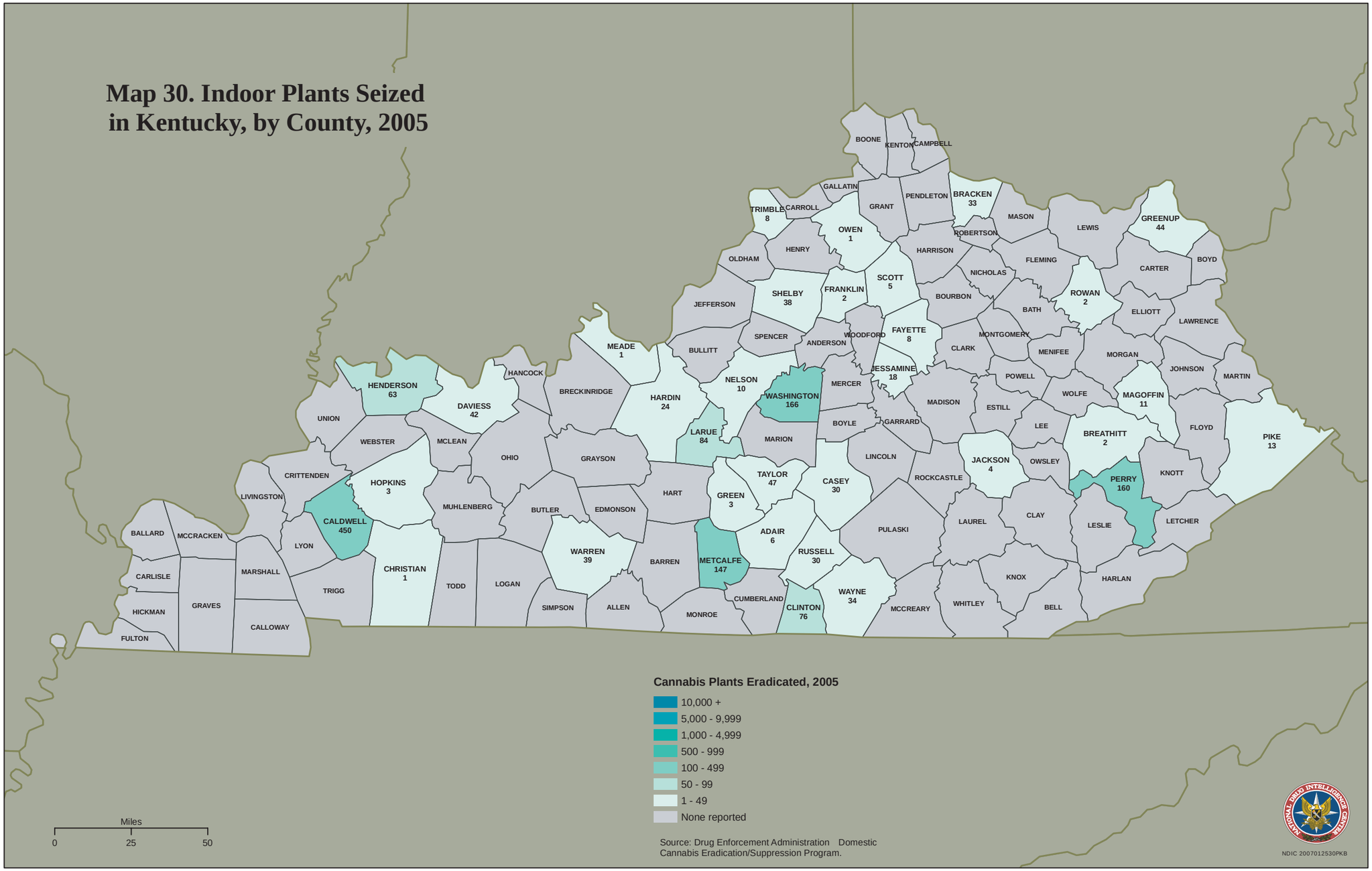

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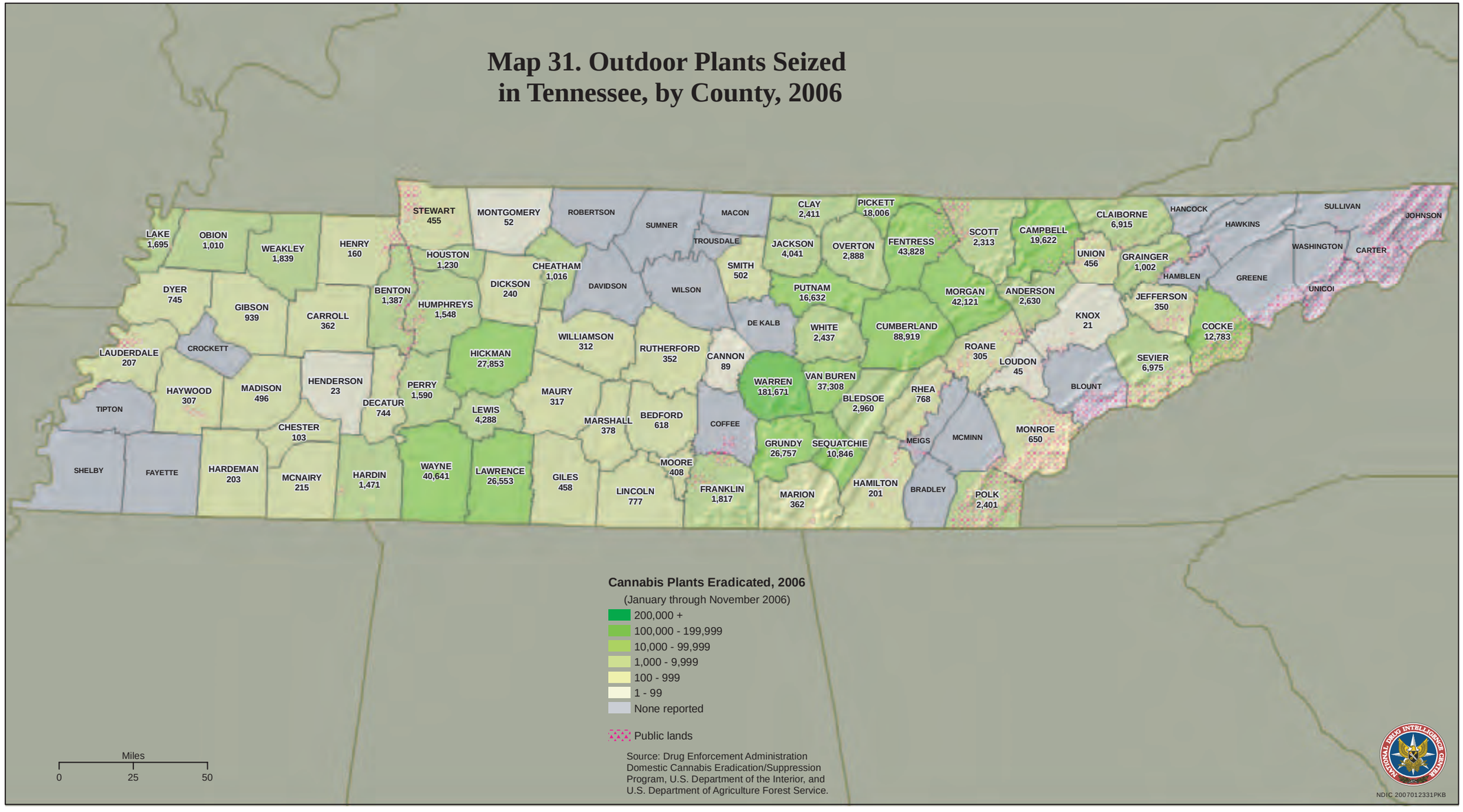

Map 31. Outdoor Plants Seized in Tennessee, by County, 2006.

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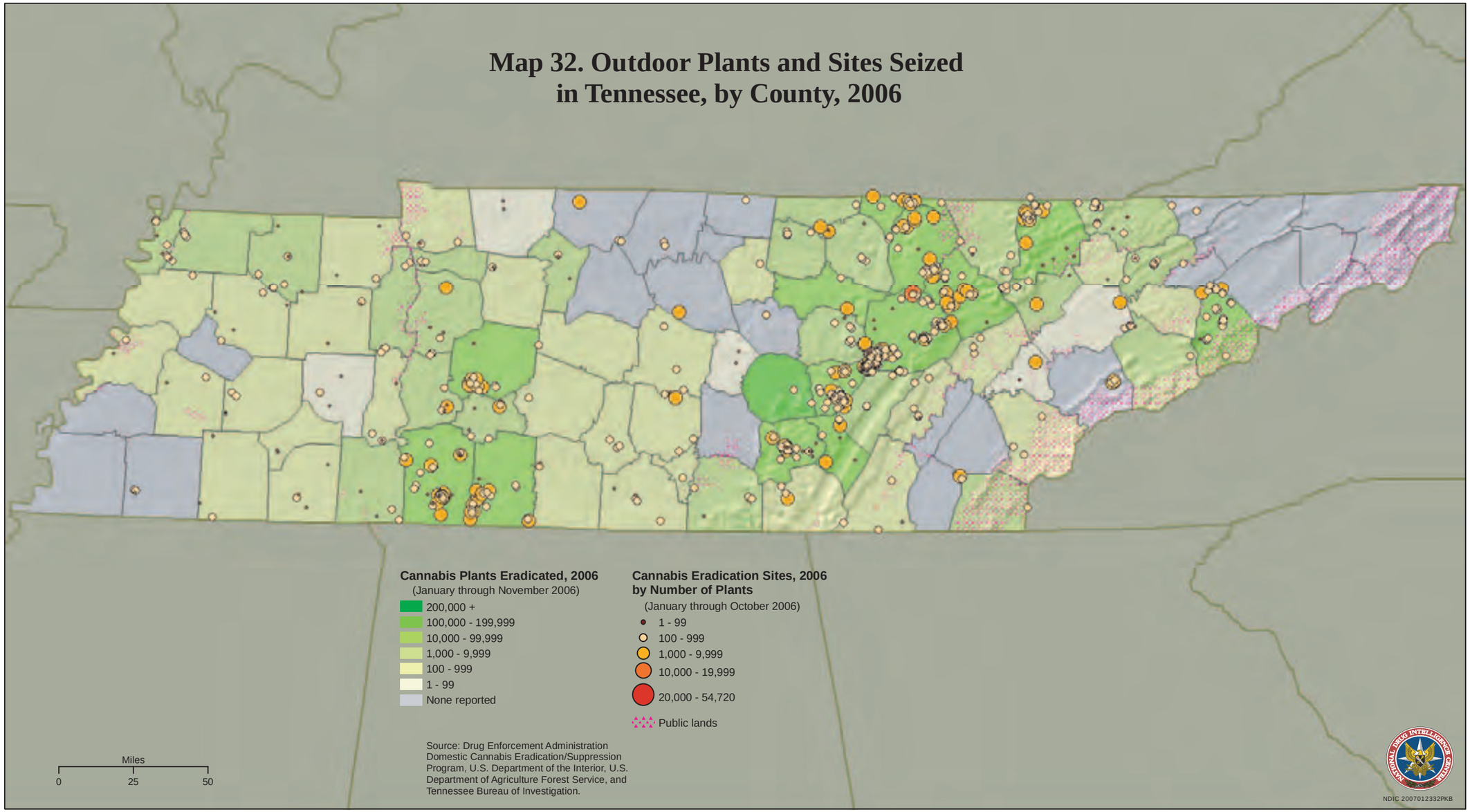

Map 32. Outdoor Plants and Sites Seized in Tennessee, by County, 2006.

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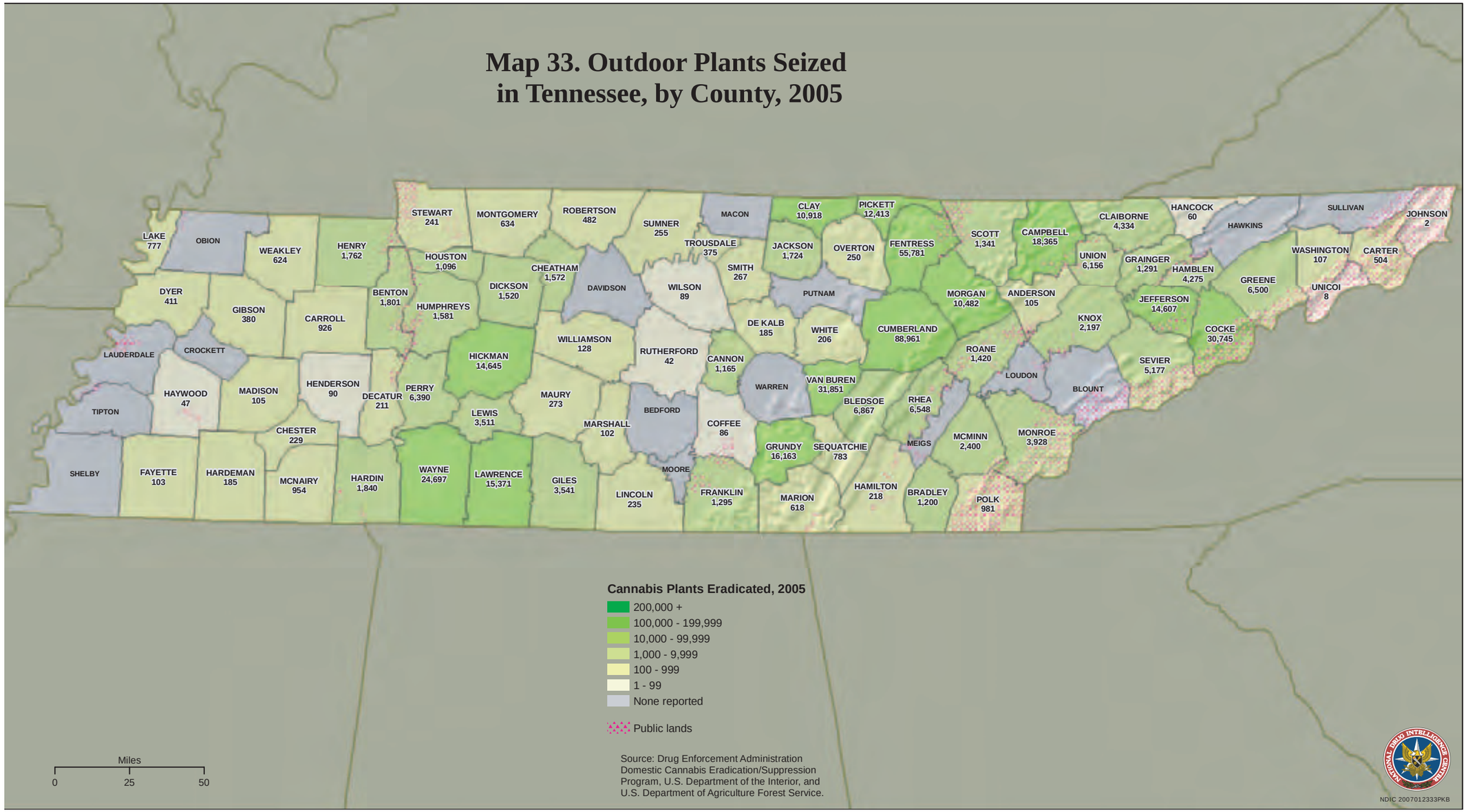

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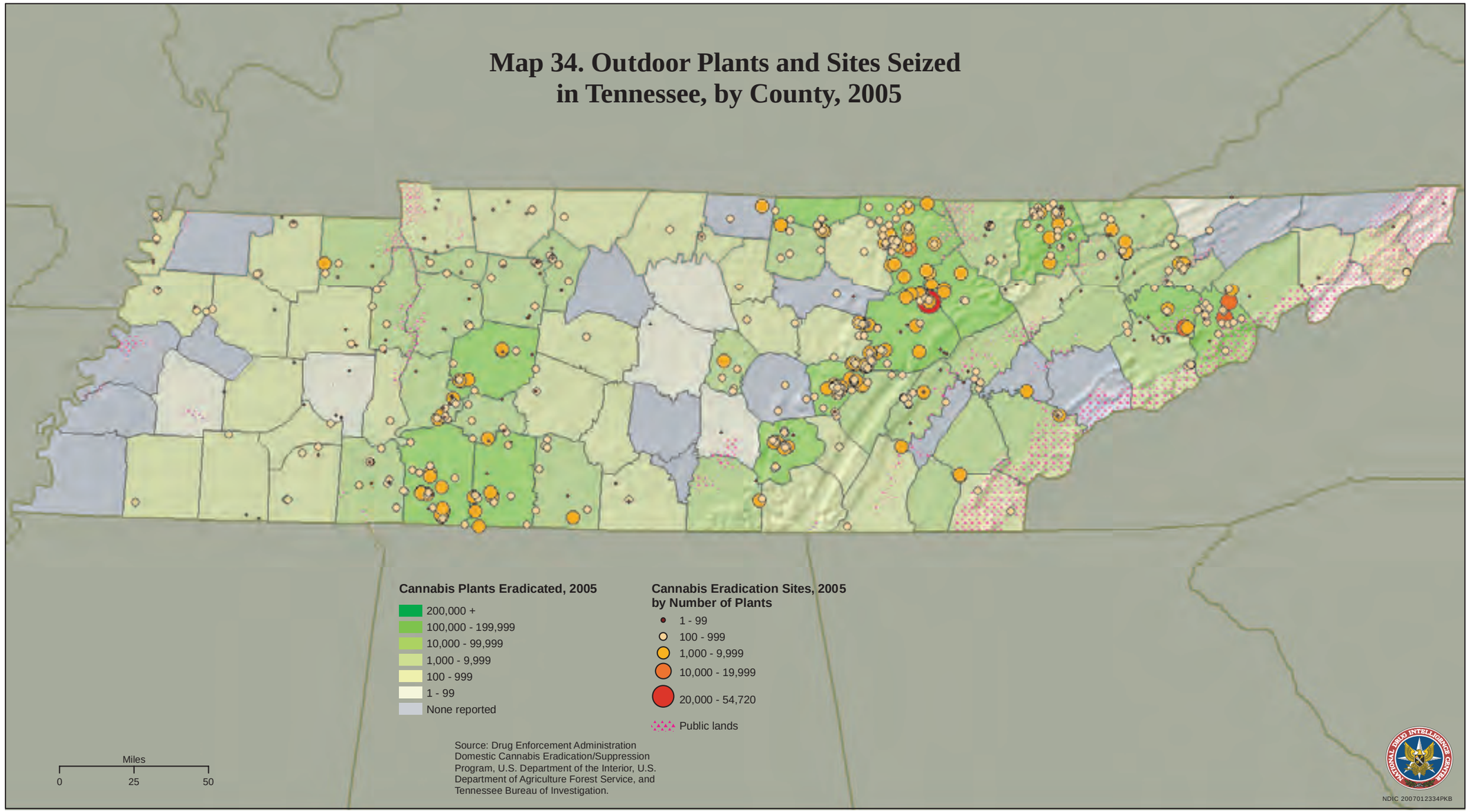

Map 34. Outdoor Plants and Sites Seized in Tennessee, by County, 2005.

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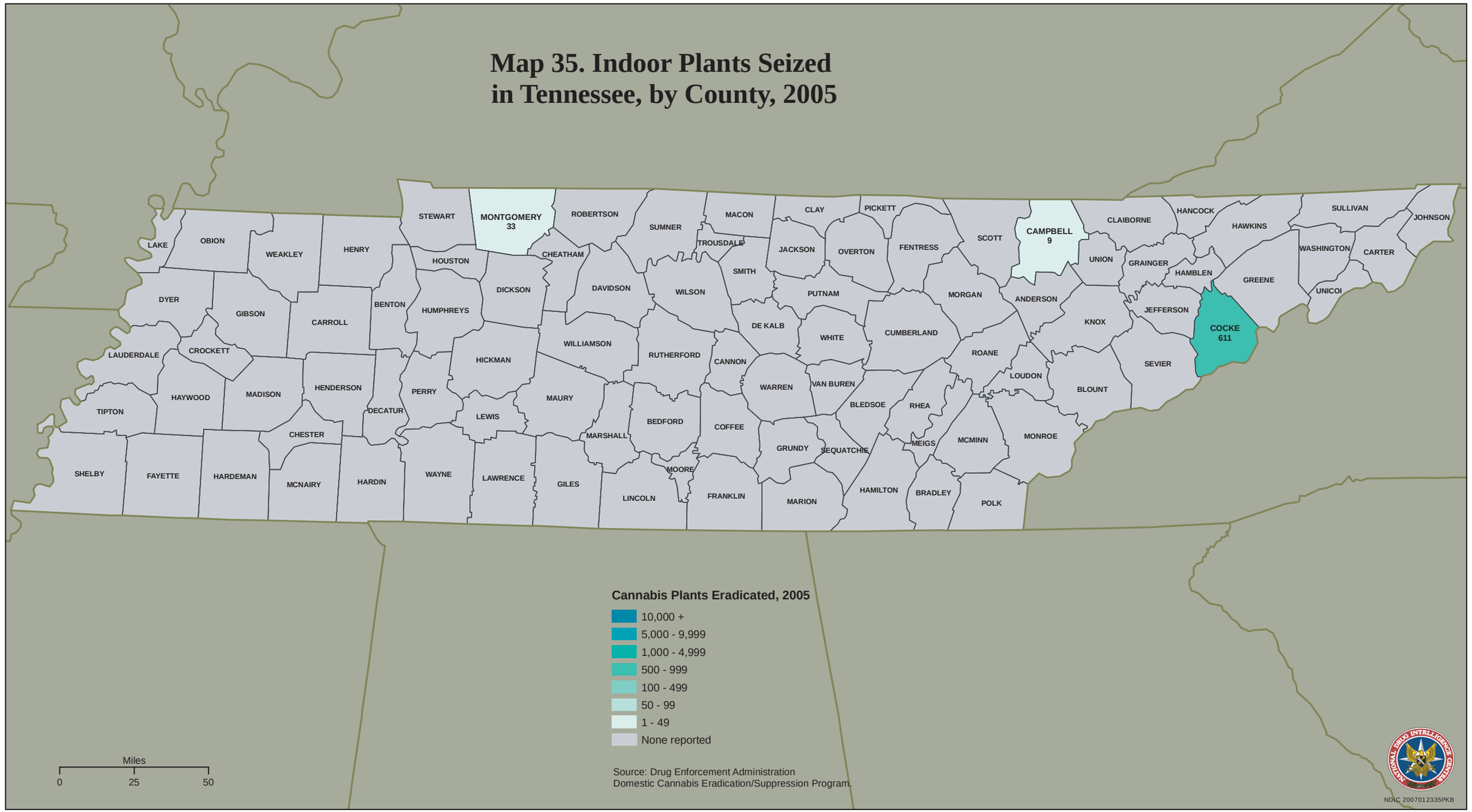

Map 35. Indoor Plants Seized in Tennessee, by County, 2005.

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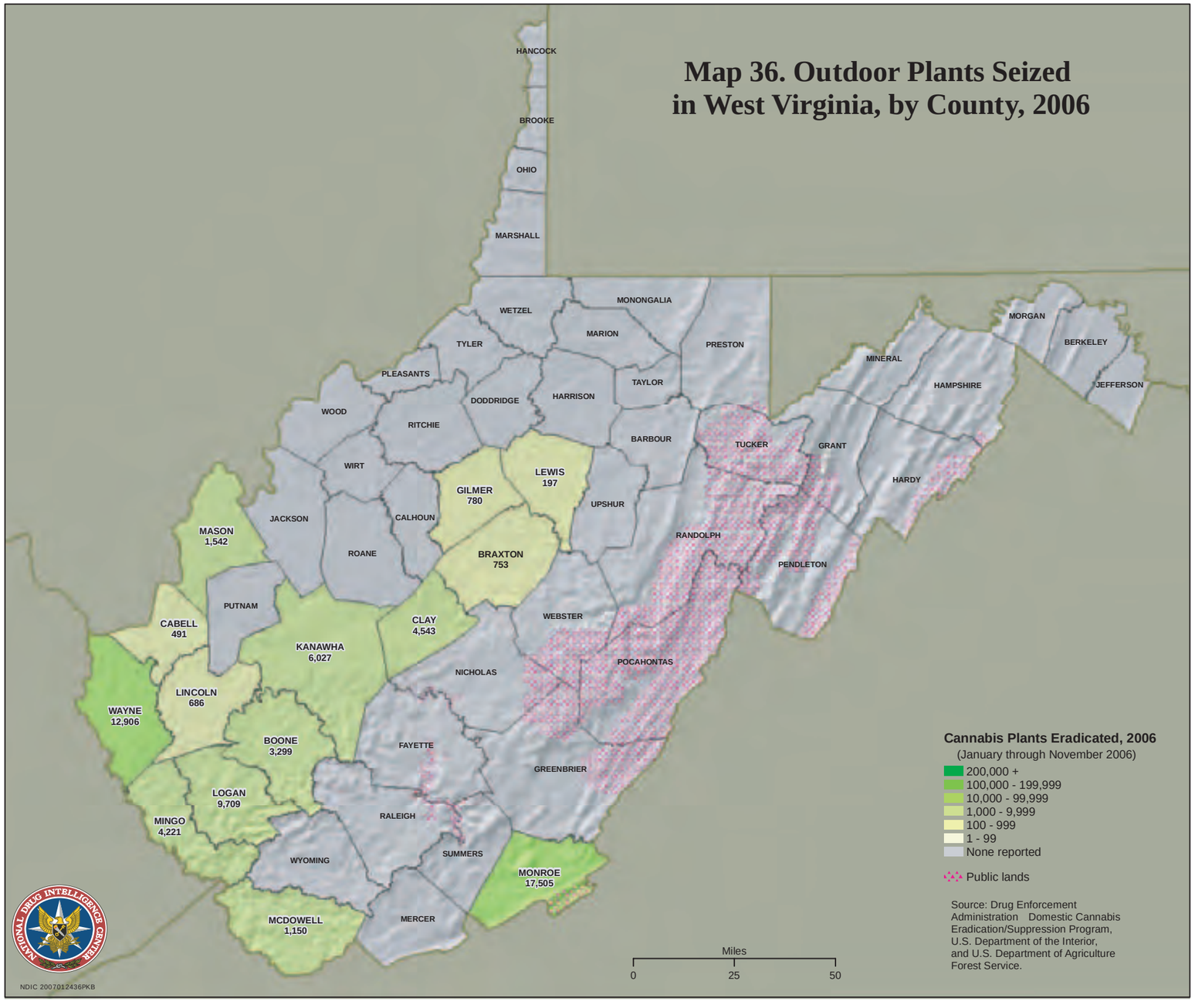

Map 36. Outdoor Plants Seized in West Virginia, by County, 2006.

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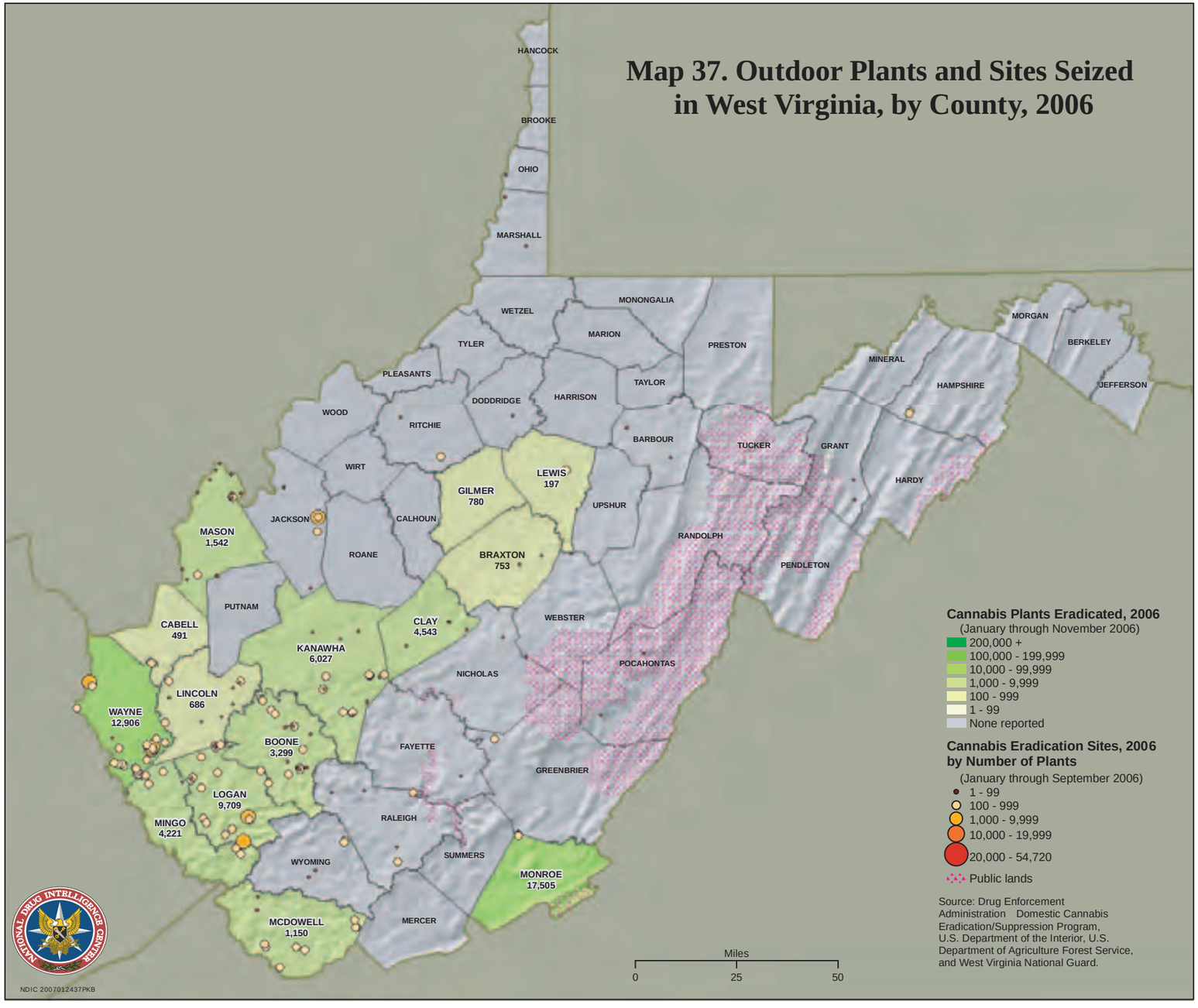

Map 37. Outdoor Plants and Sites Seized in West Virginia, by County, 2006.

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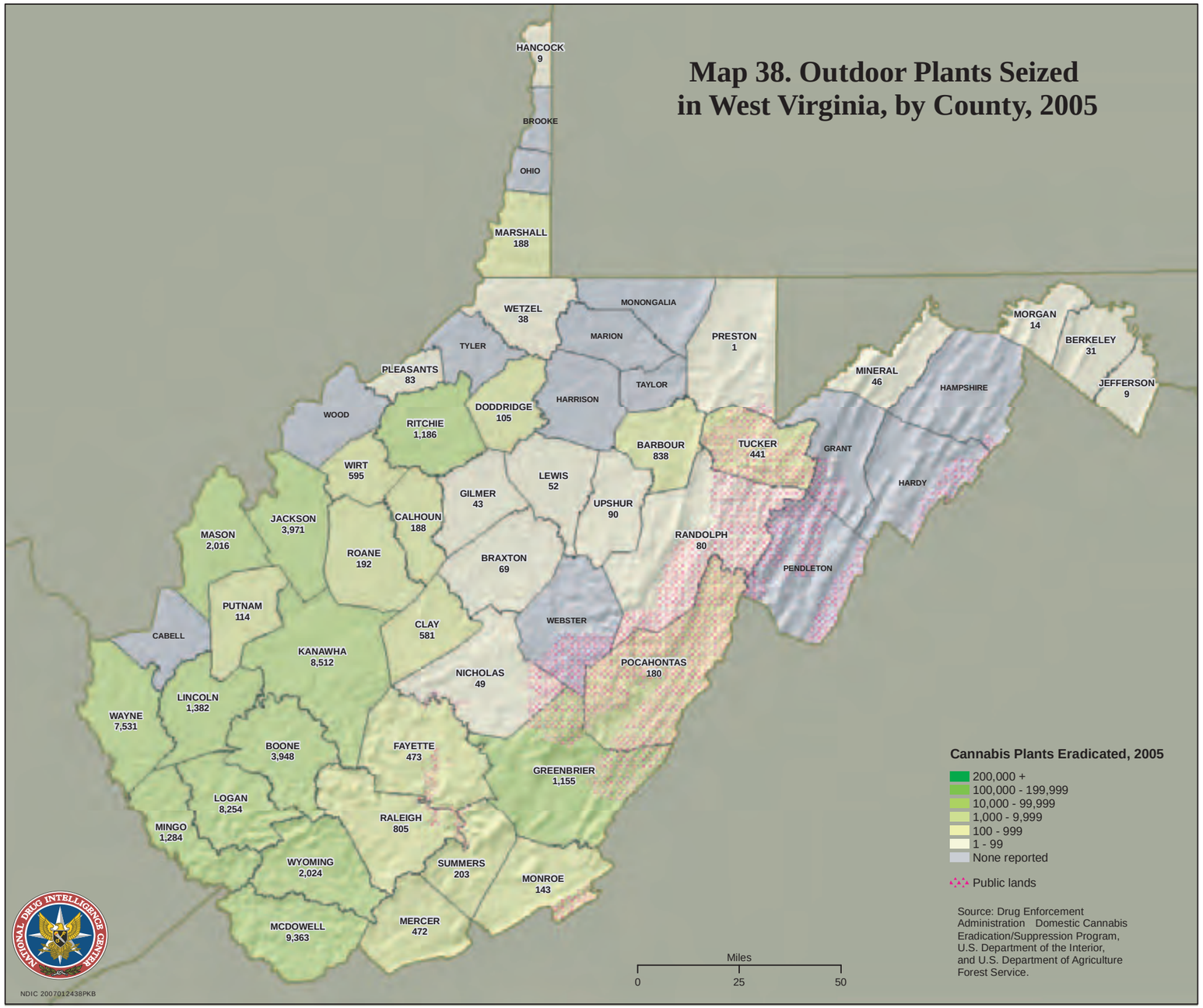

Map 38. Outdoor Plants Seized in West Virginia, by County, 2005.

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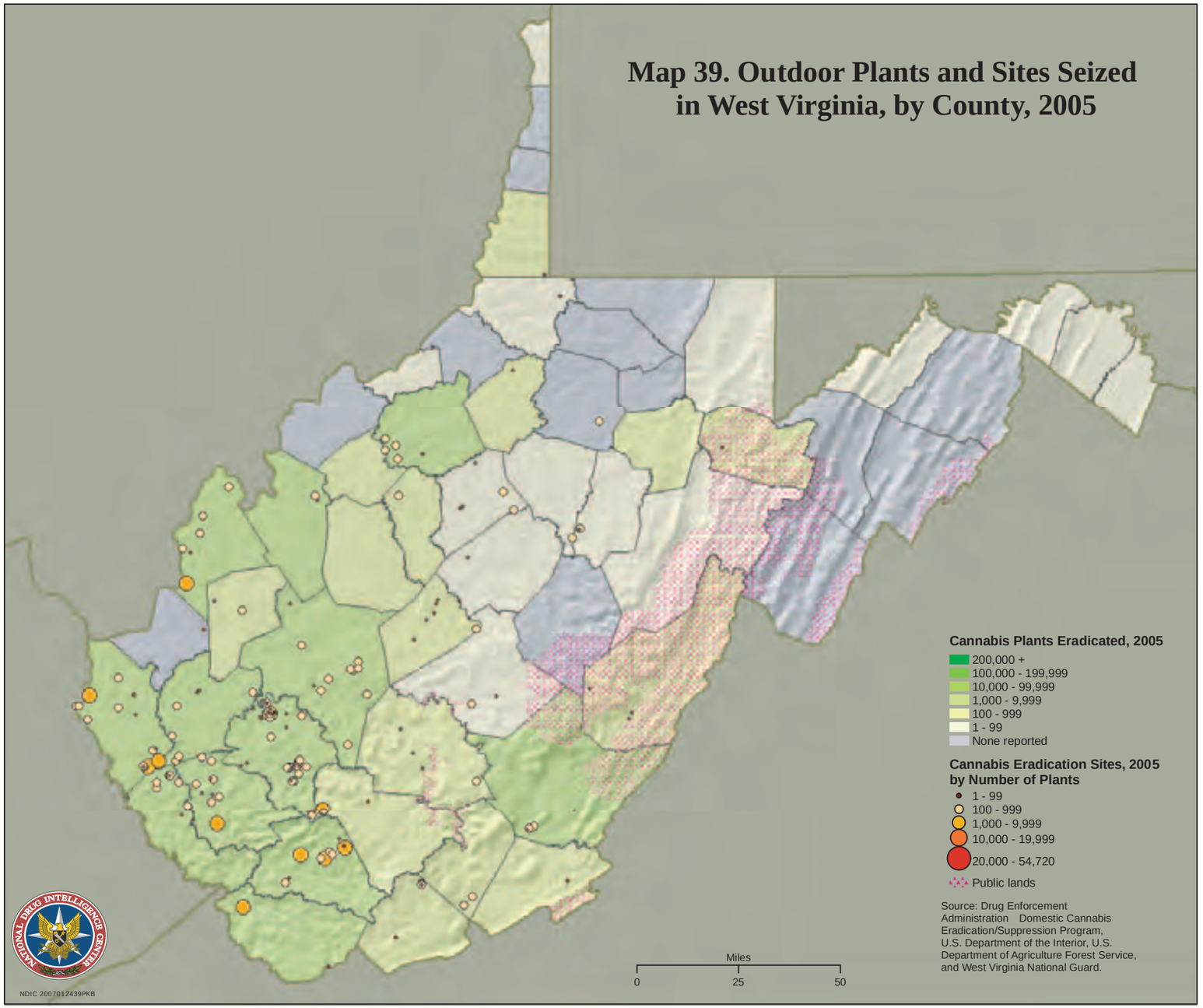

Map 39. Outdoor Plants and Sites Seized in West Virginia, by County, 2005.

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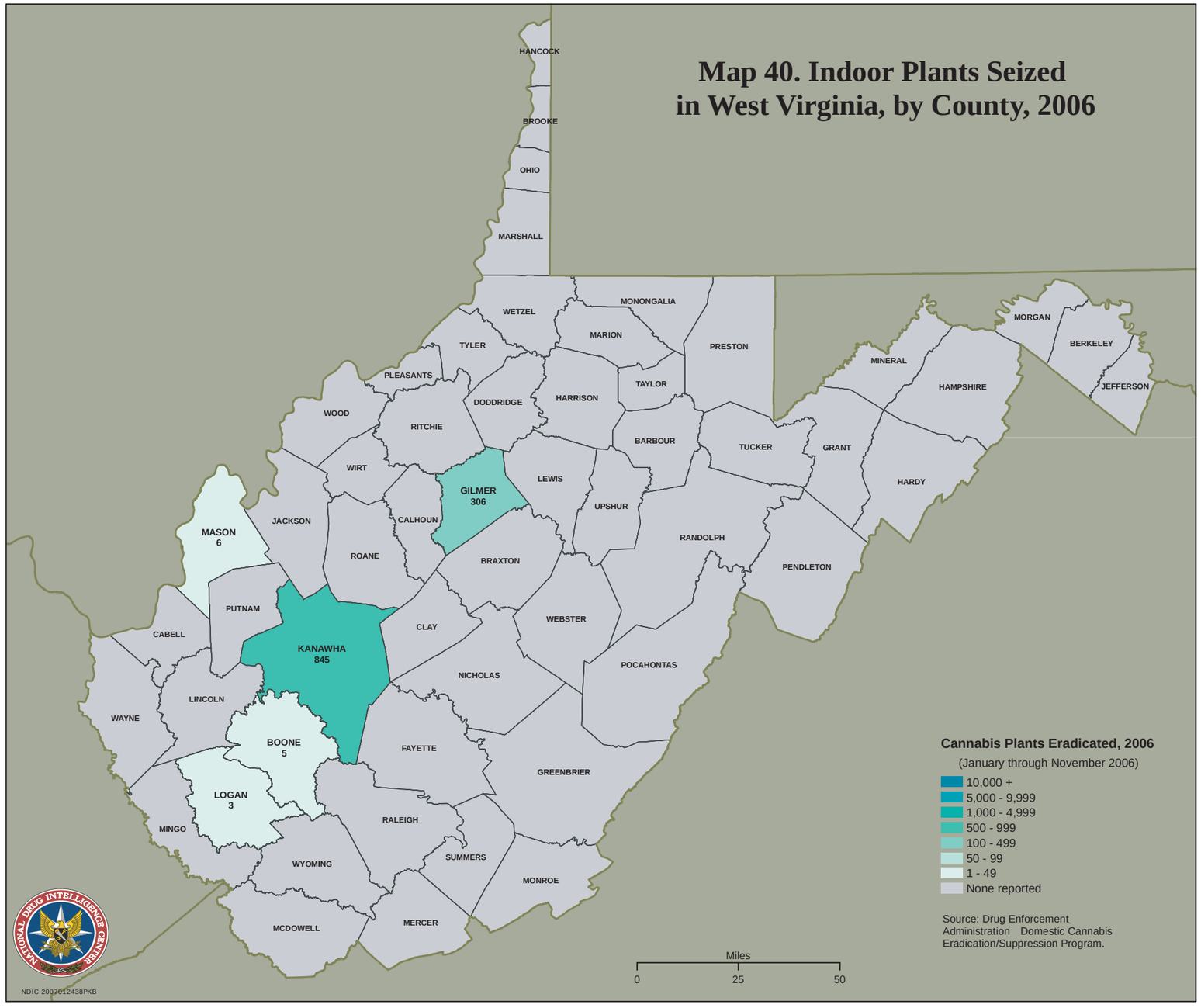

Map 40. Indoor Plants Seized in West Virginia, by County, 2006.

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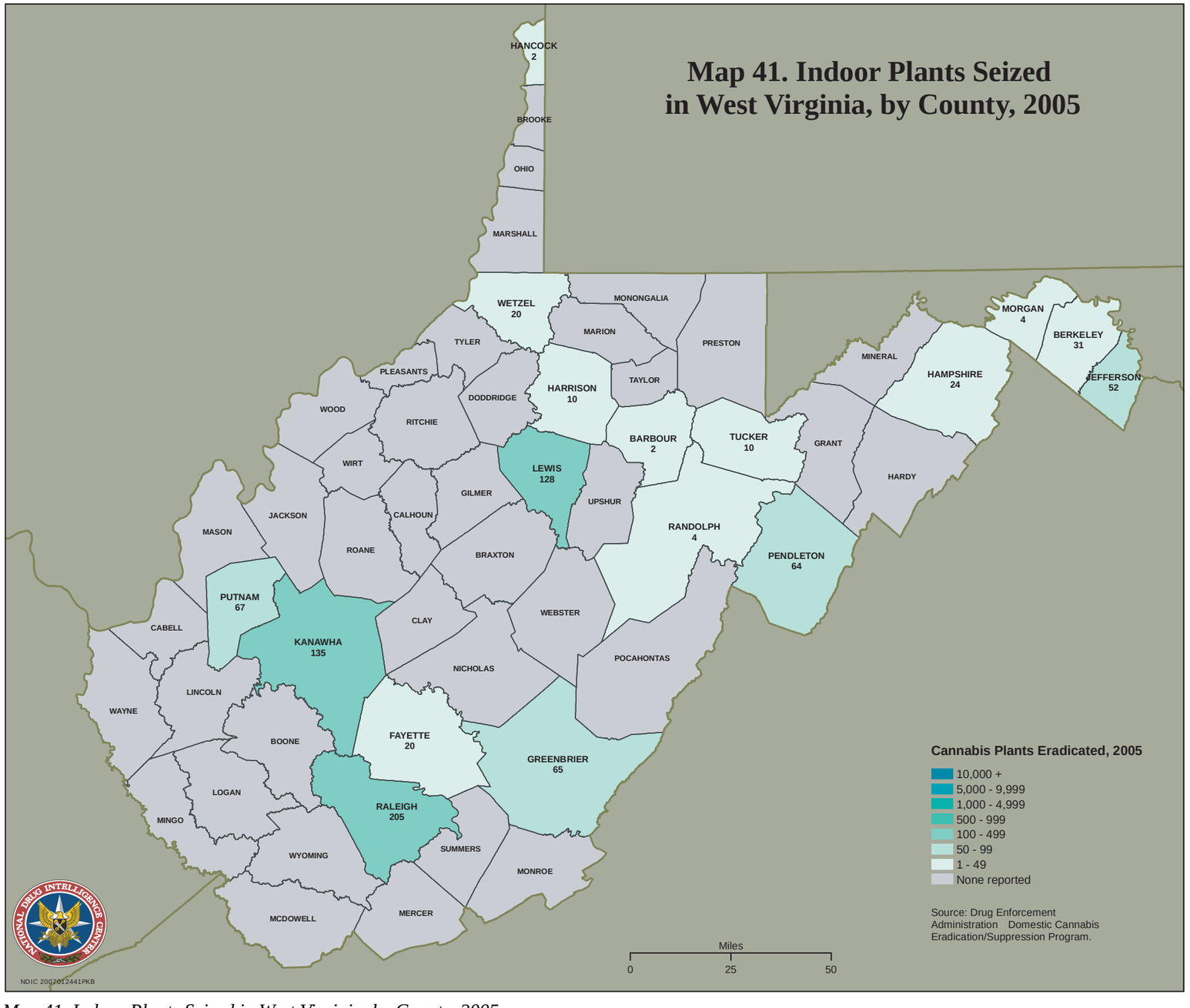

Map 41. Indoor Plants Seized in West Virginia, by County, 2005.

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Sources

Federal

Executive Office of the President
- Office of National Drug Control Policy
  - High Intensity Drug Trafficking Areas
    - Appalachia
    - Arizona
      - Demand Reduction Office
      - Post Seizure Analysis Team
    - Atlanta
    - Central Florida
    - Central Valley California
      - Marijuana Investigative Team
    - Chicago
    - Gulf Coast
    - Hawaii
    - Houston
    - Lake County
    - Los Angeles
    - Michigan
    - Milwaukee
    - Nevada
    - New England
    - New York/New Jersey
    - Northern California
    - North Florida
    - North Texas
    - Northwest
    - Ohio
    - Oregon
    - Philadelphia/Camden
    - Puerto Rico/U.S. Virgin Islands
    - Rocky Mountain
    - South Florida
    - Southwest Border
    - Washington/Baltimore
  - National Marijuana Initiative

U.S. Department of Agriculture
- Forest Service
  - National Forest System

U.S. Department of Health and Human Services
- University of Mississippi
  - Potency Monitoring Project

U.S. Department of Homeland Security
- Immigration and Customs Enforcement

U.S. Department of Justice
- Bureau of Alcohol, Tobacco, Firearms and Explosives
- Criminal Division
  - Organized Crime Drug Enforcement Task Force
- Drug Enforcement Administration
  - Atlanta Field Division
  - Boston Field Division
  - Caribbean Field Division
  - Chicago Field Division
  - Dallas Field Division
  - Denver Field Division
  - Detroit Field Division
  - Domestic Cannabis Eradication/Suppression Program
  - El Paso Field Division
  - El Paso Intelligence Center
  - Houston Field Division
  - Los Angeles Field Division
  - Miami Field Division
  - Newark Field Division
  - New Orleans Field Division
  - New York Field Division
  - Philadelphia Field Division
  - Phoenix Field Division
  - San Diego Field Division
  - San Francisco Field Division
    - Sacramento District Office
  - Seattle Field Division
  - St. Louis Field Division
  - Washington, D.C., Field Division
- Executive Office for U.S. Attorneys
  - U.S. Attorneys' Offices
- Federal Bureau of Investigation

U.S. Department of the Interior
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- National Park Service
- U.S. Fish and Wildlife Service

State

Alabama

Alabama Bureau of Investigation
- Marijuana Eradication Program

Alabama National Guard

Arizona

Arizona Department of Public Safety

Arizona State Land Department

Gila County Task Force

Maricopa County Sheriff's Office

Phoenix Police Department

Arkansas

Arkansas State Police

California

California Department of Justice
- Bureau of Narcotic Enforcement
  - Campaign Against Marijuana Planting
  - Narcotic Information Network
- California National Guard

California Secretary of State

Connecticut

Southington Police Department

Florida

Domestic Marijuana Eradication Program
- Florida National Guard
- Office of Agricultural Law Enforcement

Florida Department of Agricultural and Consumer Services

Florida Department of Law Enforcement

Miami-Dade Police Department

Port St. Lucie Police Department

Kentucky

Kentucky State Police
- Marijuana Suppression Unit

Oregon

Oregon Department of Justice

Tennessee

Lafayette Police Department

Tennessee Bureau of Investigation
Governor's Task Force for Marijuana Eradication

Tennessee Judicial Drug Task Forces
15th Judicial District Task Force

Trousdale County Sheriff's Office

Texas

Texas Department of Public Safety
Domestic Marijuana Eradication Program

Washington

Valley Narcotics Enforcement Team

Washington State Patrol

West Virginia

West Virginia Army National Guard

West Virginia State Police
Bureau of Criminal Investigations

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