

APPENDIX A
HIREP STUDY AREA CRITERIA
SELECTION PROCESS

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HIREP STUDY AREA WHITE PAPER

**Criteria Selection Process for Wind, Solar, and Geothermal Power Study Areas –
Islands of Moloka‘i, Lana‘i, and Maui
September 2011**

1. Project Overview

The Hawai‘i Interisland Renewable Energy Program (HIREP) Programmatic Environmental Impact Statement (EIS) evaluates the environmental impacts associated with an intrastate program involving renewable energy generation, transmission, and delivery. The program would produce renewable energy on one or more islands in Maui County and transfer the energy, via undersea cabling, to the Island of Oahu for distribution through the electrical grid. The purpose of the HIREP Programmatic EIS is to analyze the possible environmental consequences of the program, outline the regulatory framework for future projects, and provide guidance and best management practices for future developers of tiered-off EISs. HIREP is designed to assist in facilitating improved efficiency, reduced price volatility, reduced fossil fuel dependency, and supporting the development of additional renewable generation in the State of Hawai‘i, consistent with the goals and objectives of the Hawaii Clean Energy Initiative (HCEI).

An EIS details the process through which a project is developed, including consideration of a range of *reasonable* alternatives. Once defined, the EIS analyzes possible environmental impacts and outlines compliance with applicable environmental laws and executive orders. Unlike a project-specific EIS, which has defined location(s) and a defined project from which to start the analysis process, a programmatic EIS, by definition, uses broad geographical areas and more general assumptions to encompass a full range of possible, future project sites. While the programmatic EIS provides for a more generalized framework, the HIREP team also needed to consider the areas to be evaluated and studied as part of the EIS alternatives. As part of the programmatic EIS process for HIREP, geographical areas of study were demarcated and codified to define and inform the environmental analysis process. The effort described in the following study defines the geographical areas to be considered as part of the HIREP program. These areas are designed to be flexible enough to encompass sites that could be developed with future specific projects but exclude those areas that are currently not seen as reasonable for future development under the parameters of the HIREP program. The criteria were selected using industry standards, regulatory guidelines and restrictions, analysis of existing projects in Hawai‘i, and input from both state agencies and the U.S. Department of Energy (DOE). As part of this criteria selection process, the DOE National Renewable Energy Laboratory (NREL) officials were contacted, each criterion was discussed, and resultant maps were reviewed. NREL found this criteria selection process acceptable and the project areas were determined to be consistent with NREL standards.

NOTE: Renewable energy projects that may ultimately fall outside of the HIREP study areas, or outside the development assumptions used as a basis for the HIREP programmatic EIS, would not be prevented from development or participation in the HCEI. However, projects outside the defined HIREP study areas would be excluded from the ability to tier off of the programmatic EIS currently under development. These projects would instead complete their own, independent environmental reviews for their project in its entirety.

To initiate the criteria selection process, geographic information systems (GIS) software was used to develop base maps for the relevant islands in Maui County (Maui, Moloka'i, Lana'i). Subsequently, text criteria (outlined below) were converted to graphic overlays for the base maps of each island. Application of these overlays or "layering" resulted in defined geographical areas from the various base maps where the selected criteria were met. This criteria-filtering process applied consistent and tangible parameters to potential development areas and is based on current wind, geothermal, and solar technology. Criteria chosen by the HIREP team had to meet certain basic constraints. Each criterion was determined to be:

- Tangible, measurable, and non-ephemeral;
- Consistent with generally accepted industry criteria (commercial-scaled wind and/or solar);
- Consistently applied to all islands in the program;
- Consistent with agency policies with germane technical oversight and expertise;
- Based on best available information when establishing averages or comparisons to other wind and solar farms; and
- Related to wind, solar, and geothermal energy development feasibility and technology as it currently exists, while not preventing flexibility and creativity of future developers.

Criteria defining the study areas are outlined below and further discussed under the subchapters that follow:

Wind:

1. Technical Feasibility: 50-meter (m) wind density data — categories Fair (300 wind power density) and above
2. Size: A 50-megawatt (MW) power facility minimum size
3. Topography: Areas with greater than 20% slope were excluded
4. Census Designated Area: Census tracts with greater than 10% island population were excluded
5. Conservation Zones: Officially Designated Reserves (except Game Management Areas), National Parks, Preserves, and Sanctuaries were excluded
6. Land Use Designation: State Land Use areas zoned "Urban" were excluded
7. Hawaiian Homelands (Department of Hawaiian Home Lands [DHHL]) with documented development restrictions were excluded.

Solar:

1. Technical Feasibility: Entire island included
2. Size: A 100–MW power facility minimum size
3. Topography: Areas with greater than 5% slope were excluded
4. Census Designated Area: Census tracts with greater than 10% island population were excluded
5. Conservation Zones: Officially Designated Reserves (except Game Management Areas), National Parks, Preserves, and Sanctuaries were excluded
6. Land Use Designation: State Land Use areas zoned “Urban” were excluded
7. Hawaiian Homelands (Department of Hawaiian Home Lands [DHHL]) with documented development restrictions were excluded.

Geothermal:

1. Technical Feasibility: Area officially demarcated by the State of Hawai‘i as suitable for geothermal development
2. Size: No minimum size
3. Topography: No excluded areas
4. Census Designated Area: Census tracts with greater than 10% island population were excluded
5. Conservation Zones: Officially Designated Reserves (except Game Management Areas), National Parks, Preserves, and Sanctuaries were excluded
6. Land Use Designation: State Land Use areas zoned “Urban” were excluded
7. Hawaiian Homelands (DHHL) with development restrictions were excluded

The following sections contain the details of the application of these criteria:

2. Commercial Wind Development Study Area Criteria

2.1. NREL Wind Zone Areas

NREL 50–m wind power density maps were chosen for this project to accompany the EIS in terms of scaling, analyzing, viewing, referencing, and revising areas on the project islands. For NREL 50–m wind power density maps, wind power classifications are defined in seven different categories of wind power density with increments ranging on a scale of 0–800+. “Poor” and “marginal” areas (below 300 on the power density scale) were discounted and only those areas categorized as “fair” (300–400) and above on the base maps were included in the study areas on each of the islands. A wind power density of 300+ is considered by most commercial developers to result in acceptable conditions to support wind farms (Figures 1, 2, and 3).

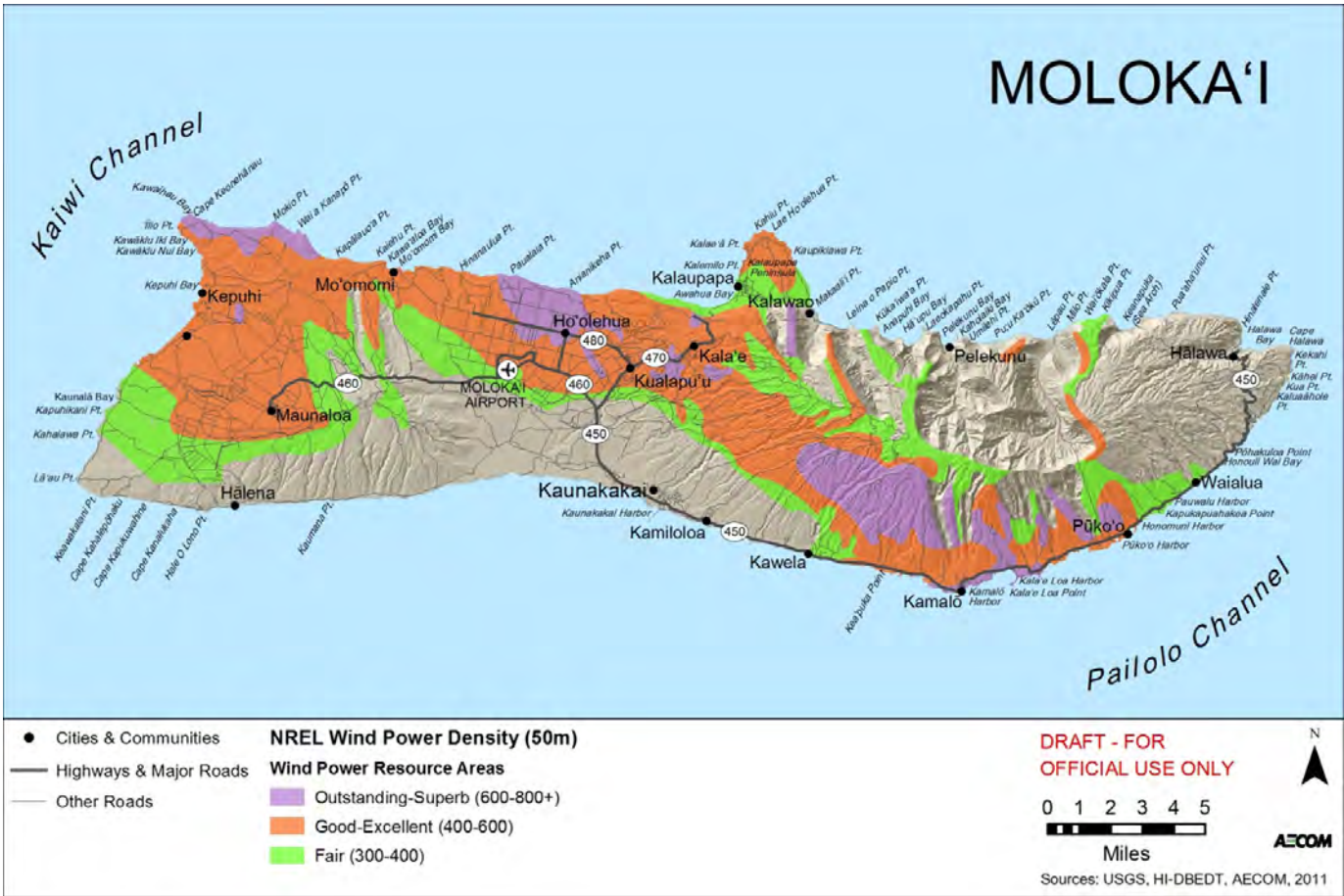


FIGURE 1

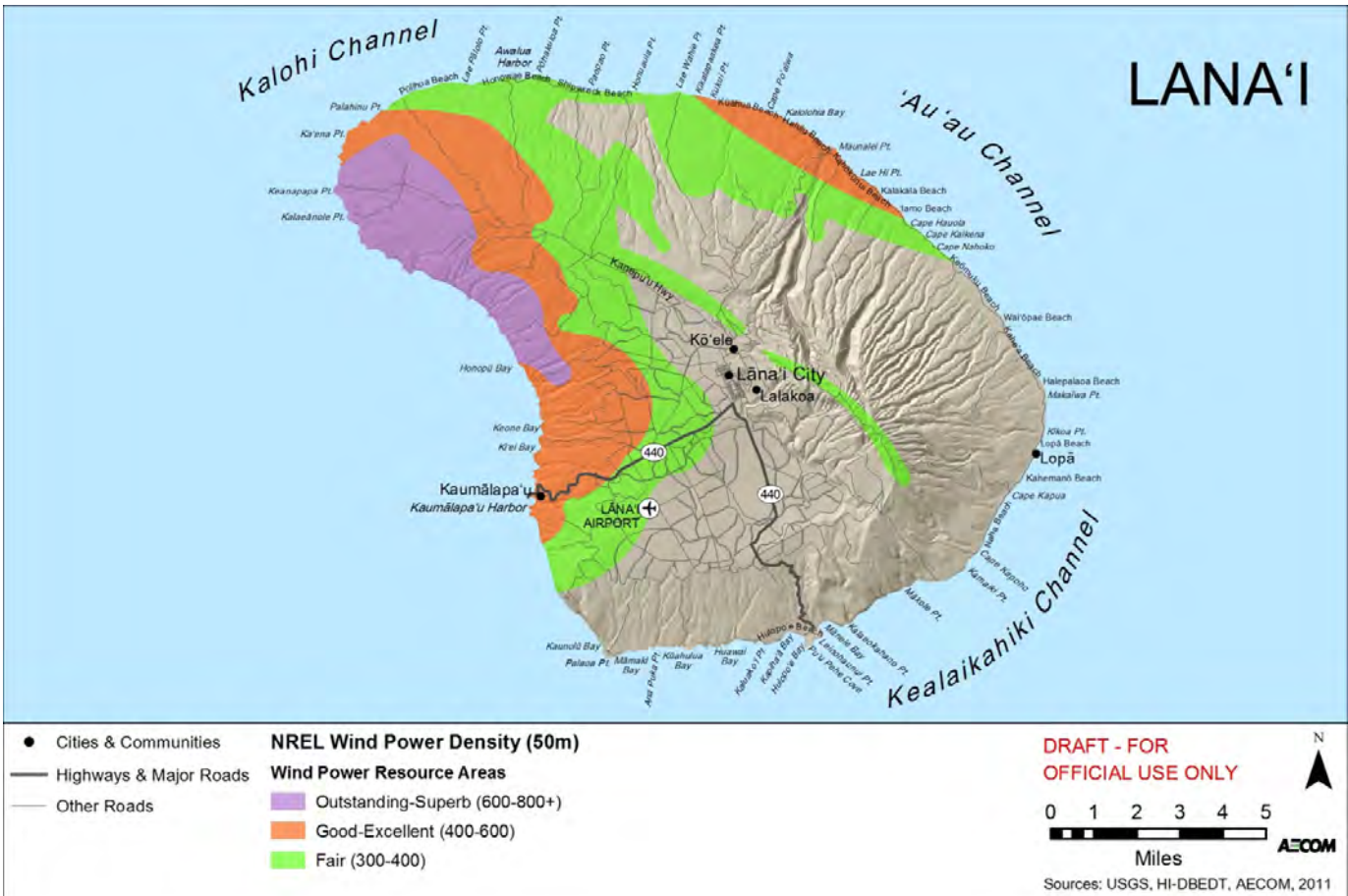


FIGURE 2

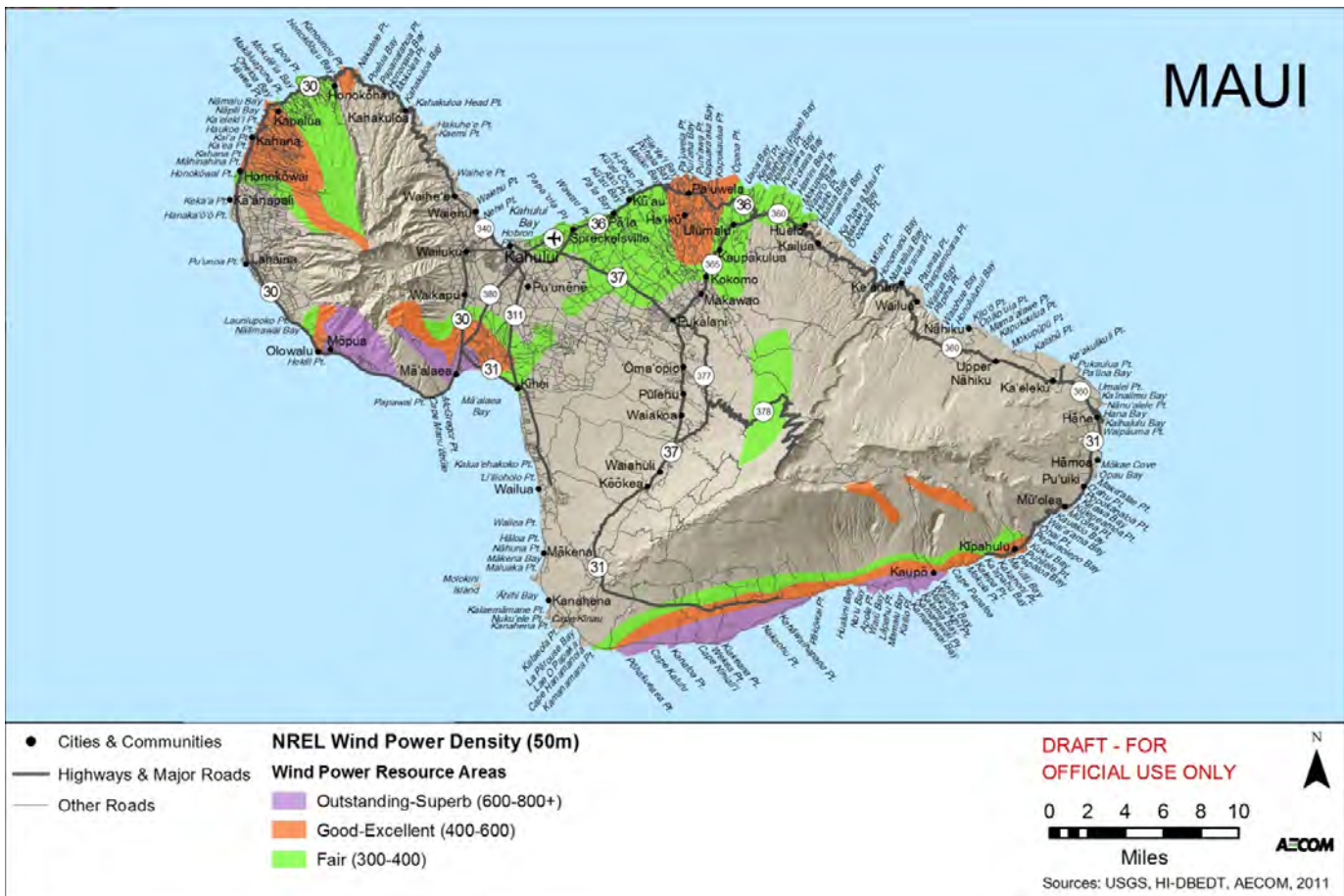


FIGURE 3

2.2. Average Slopes

Wind areas with greater than 20% slopes were discounted from the study (Figures 4, 5, and 6). This parameter was based on:

1. Generally accepted wind industry standards
2. Knowledge of standard construction industry preferences
3. Acknowledgement of transportation complexities and development costs on slopes exceeding 20%

NOTE: In some areas of the HIREP study area boundaries, slope may exceed 20%. These areas were left in the study area to maintain cohesion between larger surrounding areas that were below 20%. It is assumed that follow-on project-specific EIS efforts will consider and address any slope constraints at the site level.

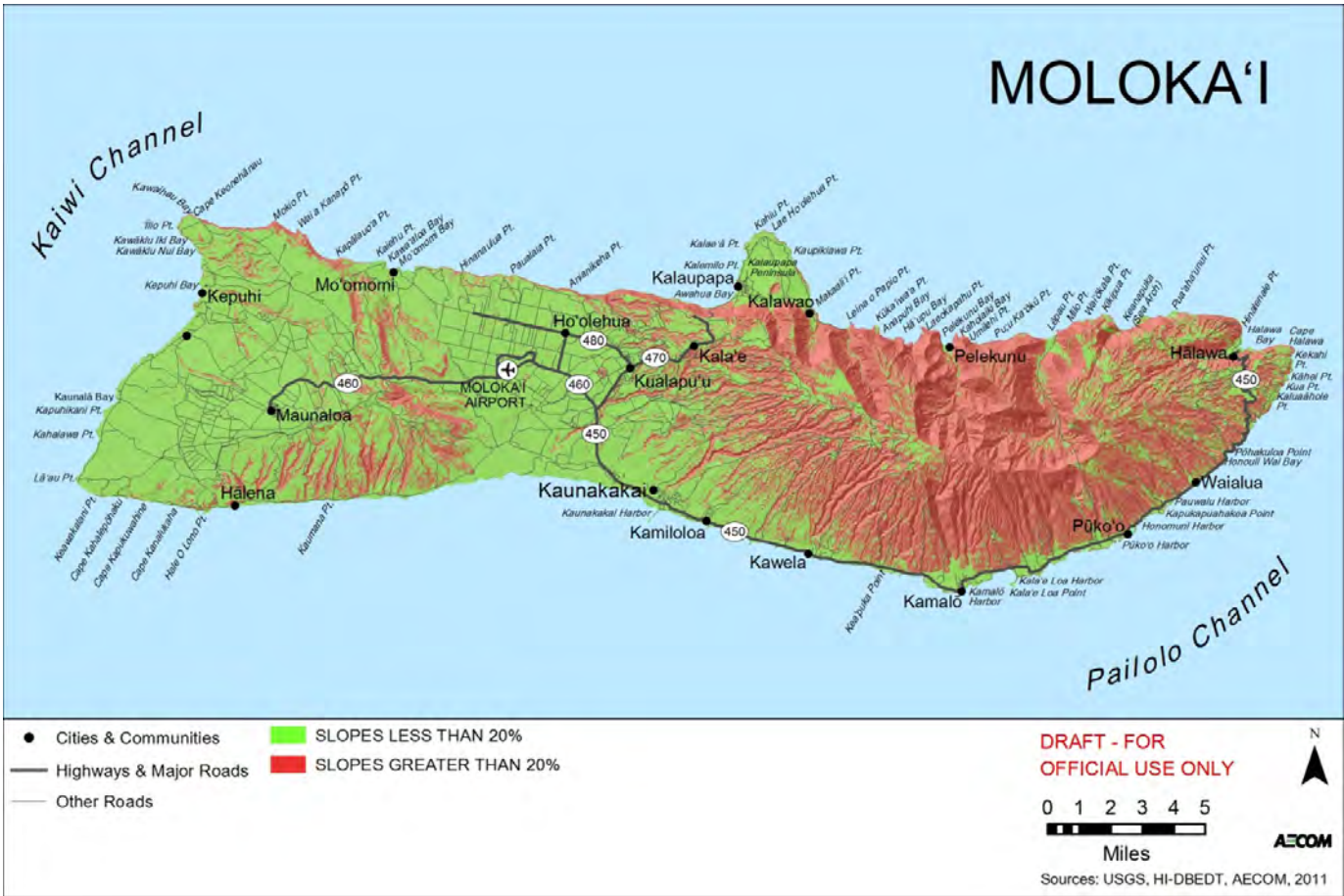


FIGURE 4

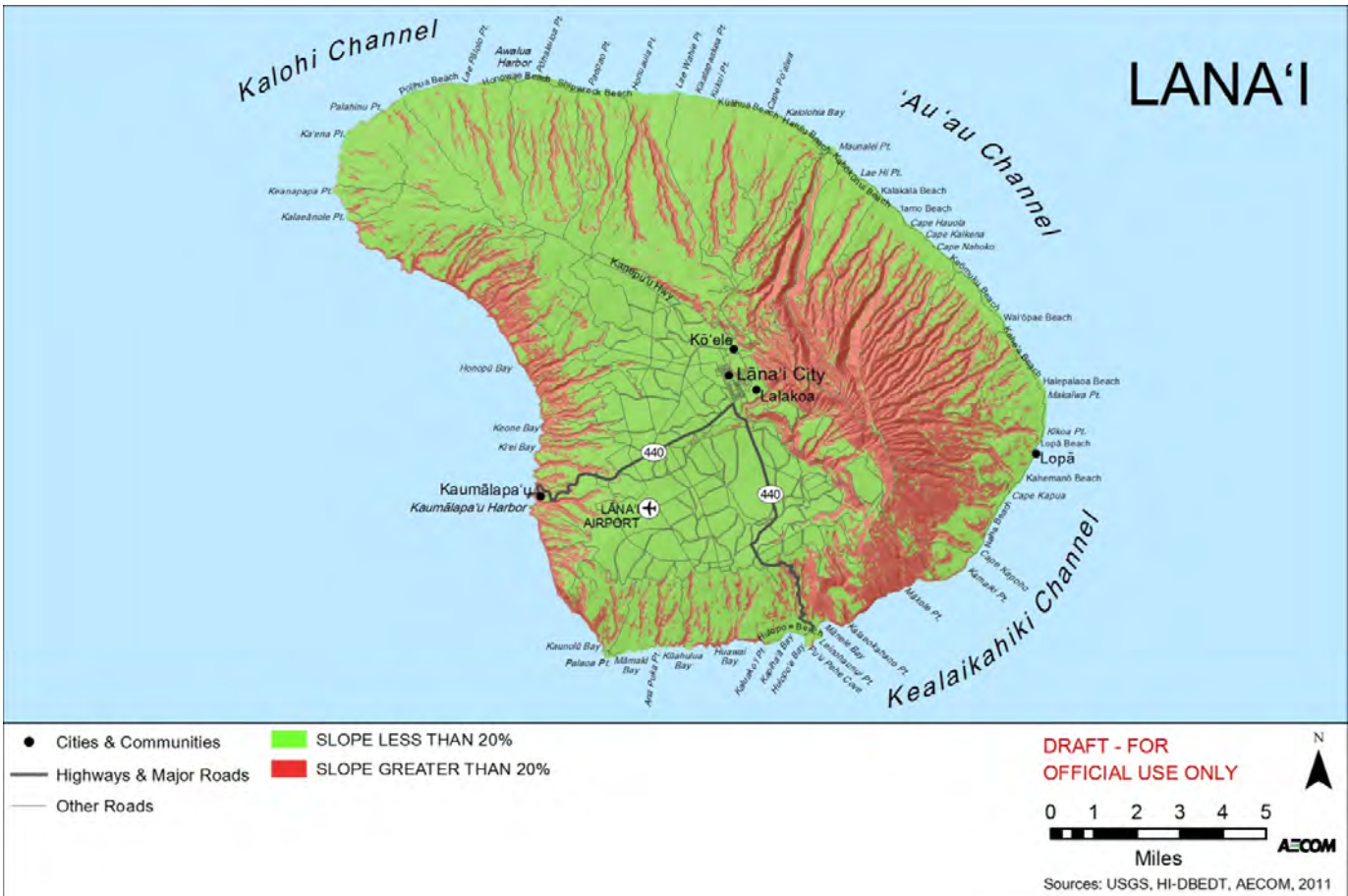


FIGURE 5

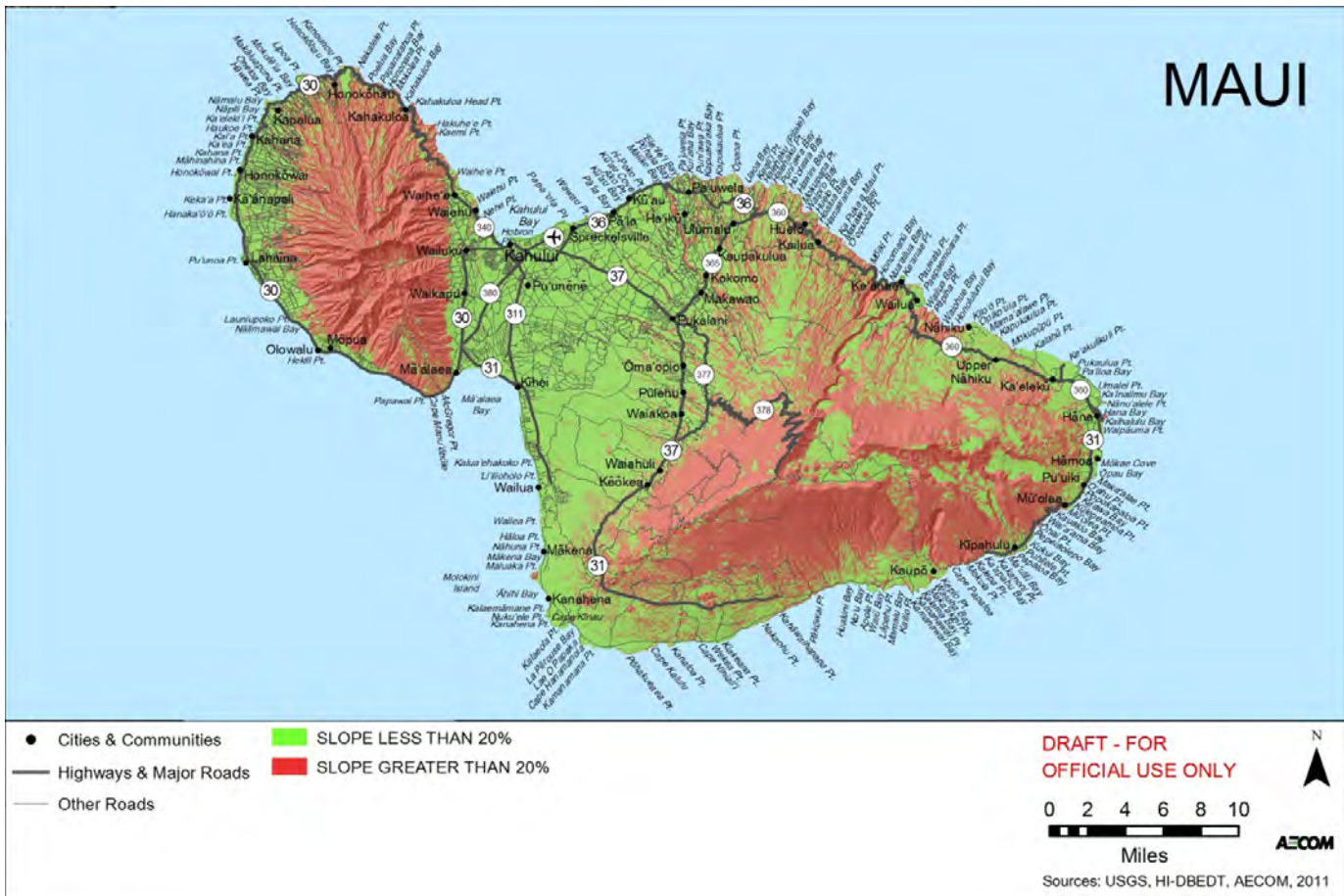


FIGURE 6

2.3. Officially Designated Reserves, National Parks, State Preserves, Sanctuaries, and other Protected Lands

Areas zoned “Conservation” under state land use designations are not precluded from development of wind farms. However, many official parks, preserves, reserves, and sanctuaries are located in Conservation-zoned lands (Figures 7, 8, and 9). These did not include game management areas (areas managed for the hunting of animals) and areas whose mission may not preclude the development of renewable energy facilities. The designated areas in the table below were not considered for wind farm development:

- The Division of Forestry and Wildlife (DOFAW)-managed bird sanctuaries are excluded from consideration as access is either closed or restricted under HAR § 13-126-4.
- DOFAW-managed Natural Area Reserves (NARs) are excluded as development is prohibited under HAR §13-209-4 (6): Natural Area Reserves.
- The Nature Conservancy (TNC)-managed preserves are excluded as wind farm development is deemed incompatible with goals of the TNC-managed preserves.
- DOFAW-managed forest reserves are excluded as wind farm development is deemed incompatible with goals and policies defined for the Forest Reserves (HAR § 13-104; Moloka‘i

Forest Reserve Management Plan, DOFAW 11/2009; Waihou Spring State Forest Reserve Management Plan, DOFAW, 09/2010).

- Development in the Honolua–Mokuleia Marine Life Conservation District is excluded under provisions of HAR §13–32–2 (2): MLCD--Honolua–Mokuleia.

| Name | Type | Managed by |
|---|-----------------------------------|-----------------------|
| Maui | | |
| Moku Mana Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Moku Hala Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Keopuka Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Papanui o Kane Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Mokeehia Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Alau Island Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Puuku Island Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Molokini Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Hulu Island Sea Bird Sanctuary | Bird Sanctuary | Private |
| West Maui Forest Reserve | Forest Reserve | DOFAW |
| Koolau Forest Reserve | Forest Reserve | DOFAW |
| Makawao Forest Reserve | Forest Reserve | DOFAW |
| Hana Forest Reserve | Forest Reserve | DOFAW |
| Kahikinui Forest Reserve | Forest Reserve | DOFAW |
| Kipahulu Forest Reserve | Forest Reserve | DOFAW |
| Kula Forest Reserve | Forest Reserve | DOFAW |
| Kahikinui Forest Reserve | Forest Reserve | DOFAW |
| Kahakuloa Game Management Area | Game Management Area | DOFAW |
| Honolua–Mokuleia MLCD | Marine Life Conservation District | DAR |
| Haleakala National Park | National Park | National Park Service |
| Kealia Pond National Wildlife Refuge | National Wildlife Refuge | USFWS |
| West Maui NAR (Kahakuloa Sec) | Natural Area Reserve | DOFAW |
| West Maui NAR (Honokowai Sec) | Natural Area Reserve | DOFAW |
| West Maui NAR (Panaewa Sec) | Natural Area Reserve | DOFAW |
| West Maui NAR (Lihau Sec) | Natural Area Reserve | DOFAW |
| Hanawi Natural Area Reserve | Natural Area Reserve | DOFAW |
| Kanaio Natural Area Reserve | Natural Area Reserve | DOFAW |
| Ahihi–Kinau Natural Area Reserve | Natural Area Reserve | DOFAW |
| Halekii–Pihana Heiau State Monument | State Monument | DOSP |
| Iao Valley State Monument | State Monument | DOSP |
| Waiianapanapa State Park | State Park | DOSP |
| Makena State Park | State Park | DOSP |
| Polipoli Spring State Recreation Area | State Recreation Area | DOSP |
| Kaumahina State Wayside | State Wayside | DOSP |

| Name | Type | Managed by |
|------------------------------------|--------------------------|-------------------------|
| Wailua Valley State Wayside | State Wayside | DOSP |
| Puaa Kaa State Wayside | State Wayside | DOSP |
| Kapunakea Preserve | Nature Conservancy | Private |
| Waikamoi Preserve | Nature Conservancy | Private |
| Waihee Coastal Dunes and Wetlands | Wetlands Refuge | Maui Coastal Land Trust |
| Kanaha Pond Wildlife Sanctuary | Wildlife Sanctuary | DOFAW |
| Pauwahu Point Wildlife Sanctuary | Wildlife Sanctuary | DOFAW |
| Molokai | | |
| Mokapu Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Okala Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Huelo Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Mokumanu Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Molokai Forest Reserve | Forest Reserve | DOFAW |
| Molokai Forest Reserve/Kalaupapa | Forest Reserve | DOFAW |
| Kalaupapa National Historical Park | National Historical Park | National Park Service |
| Kakahāia National Wildlife Refuge | National Wildlife Refuge | USFWS |
| Olokui National Area Reserve | Natural Area Reserve | DOFAW |
| Puu Alii Natural Area Reserve | Natural Area Reserve | DOFAW |
| Kamiloloa Plant Sanctuary | Plant Sanctuary | DOFAW |
| Kapuna Spring Water Reserve | Reserve (other) | Maui County |
| Palaau State Park | State Park | DOSP |
| Moomomi Preserve | Nature Conservancy | Private |
| Pelekunu Preserve | Nature Conservancy | Private |
| Kamakou Preserve | Nature Conservancy | Private |
| Lanai | | |
| Kanepuu Preserve | Nature Conservancy | Private |
| Nanahoa Islets Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Moku Naio Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Poopoo Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |
| Puupepe Islet Sea Bird Sanctuary | Bird Sanctuary | DOFAW |

KEY:

DAR Department of Land and Natural Resources [DLNR] – Division of Aquatic Resources

DOFAW DLNR – Division of Forestry and Wildlife

DOSP DLNR – Division of State Parks

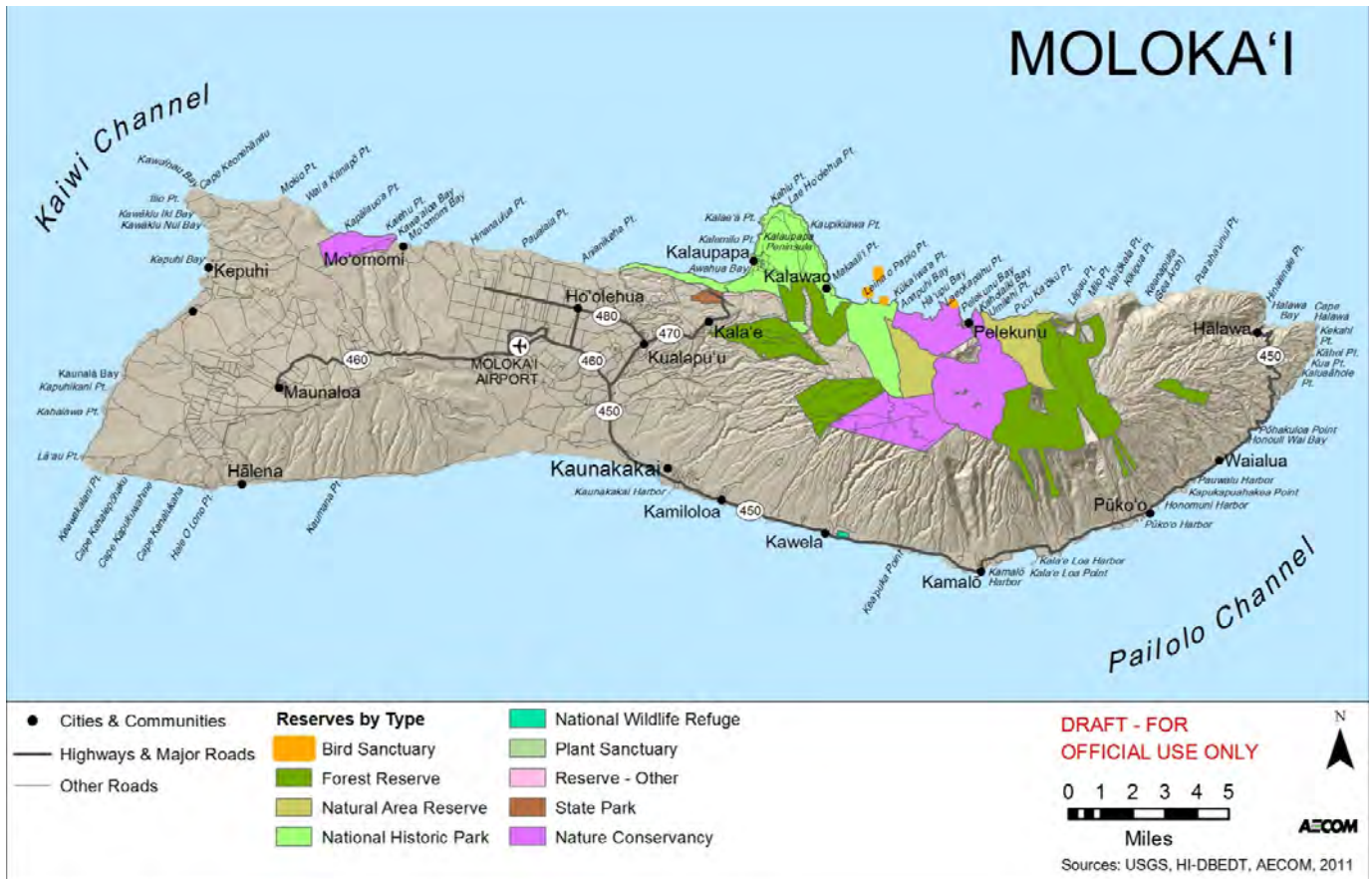


FIGURE 7

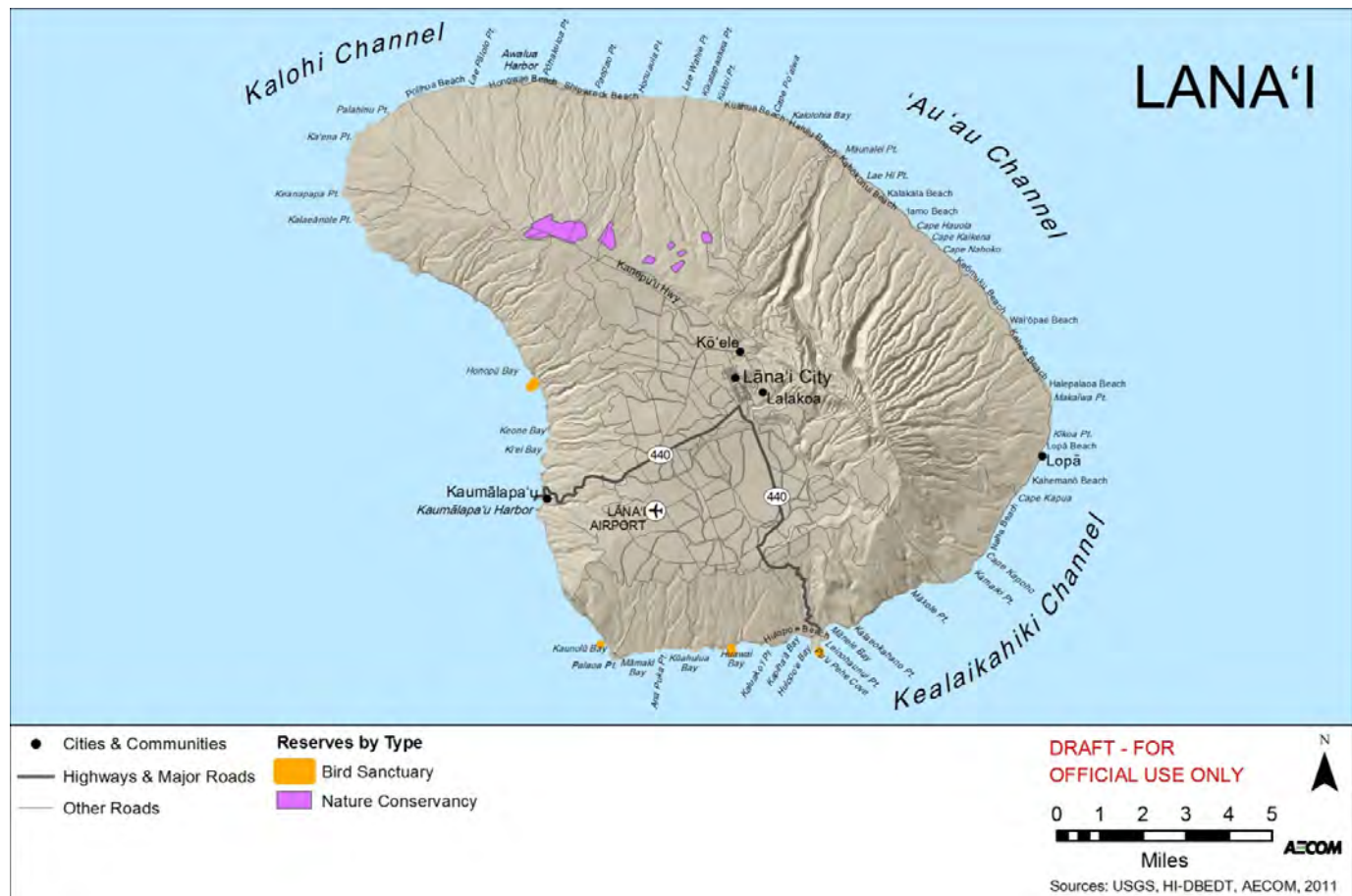


FIGURE 8

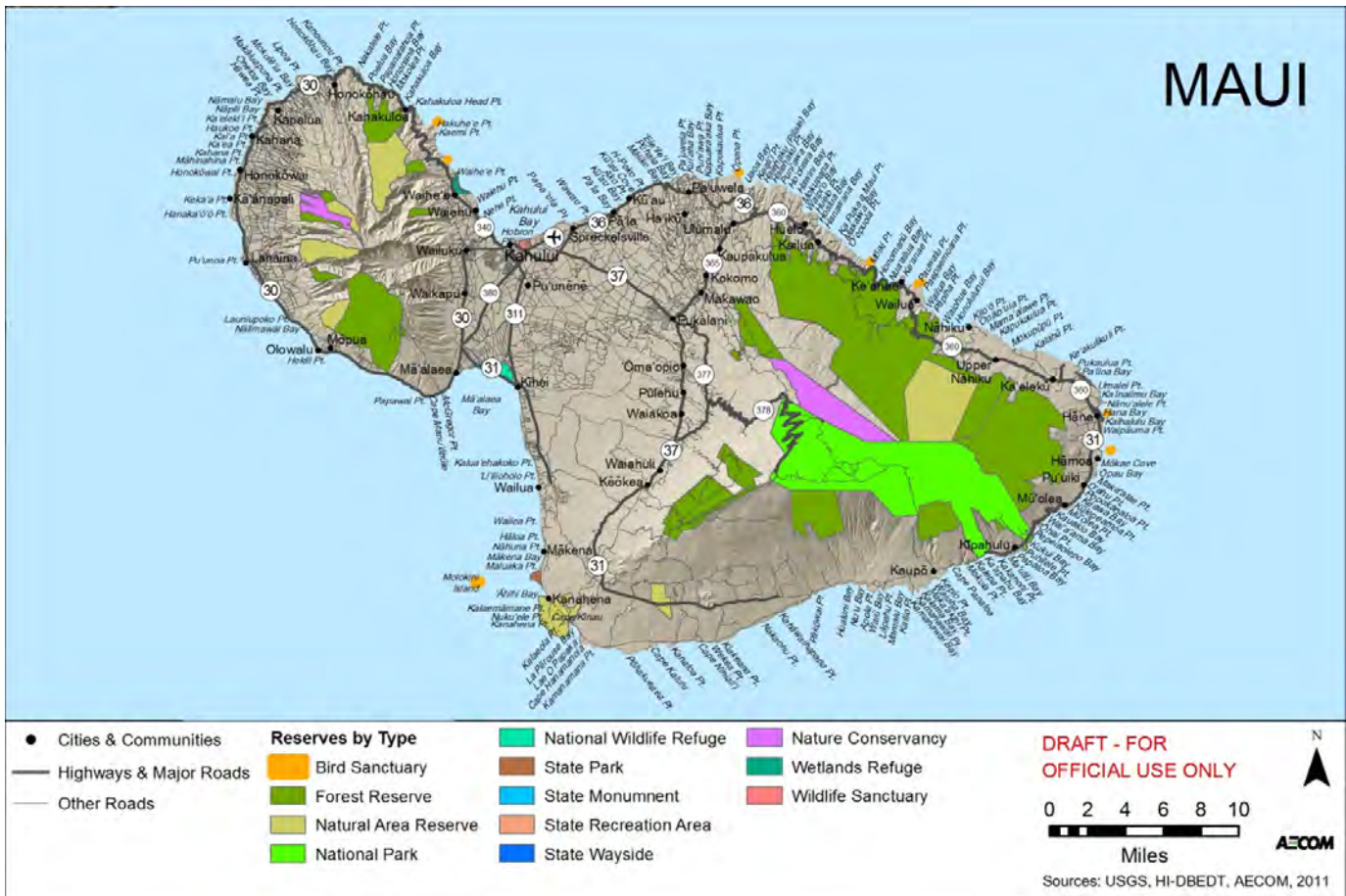


FIGURE 9

2.4. Areas with a State Land Use Designation of “Urban”

There are four state land use designations under Hawai‘i’s State Land Use Zoning System. Conservation, Agriculture, and Rural designations constitute the vast majority of lands with Urban-zoned lands making up approximately 4.8% of all state lands (2009 State of Hawai‘i Data Book). Due to the density, types of intensive land uses, public safety concerns, and the limited lands allocated for urban uses, Urban-zoned lands were removed from consideration in the study (Figures 10, 11, and 12).

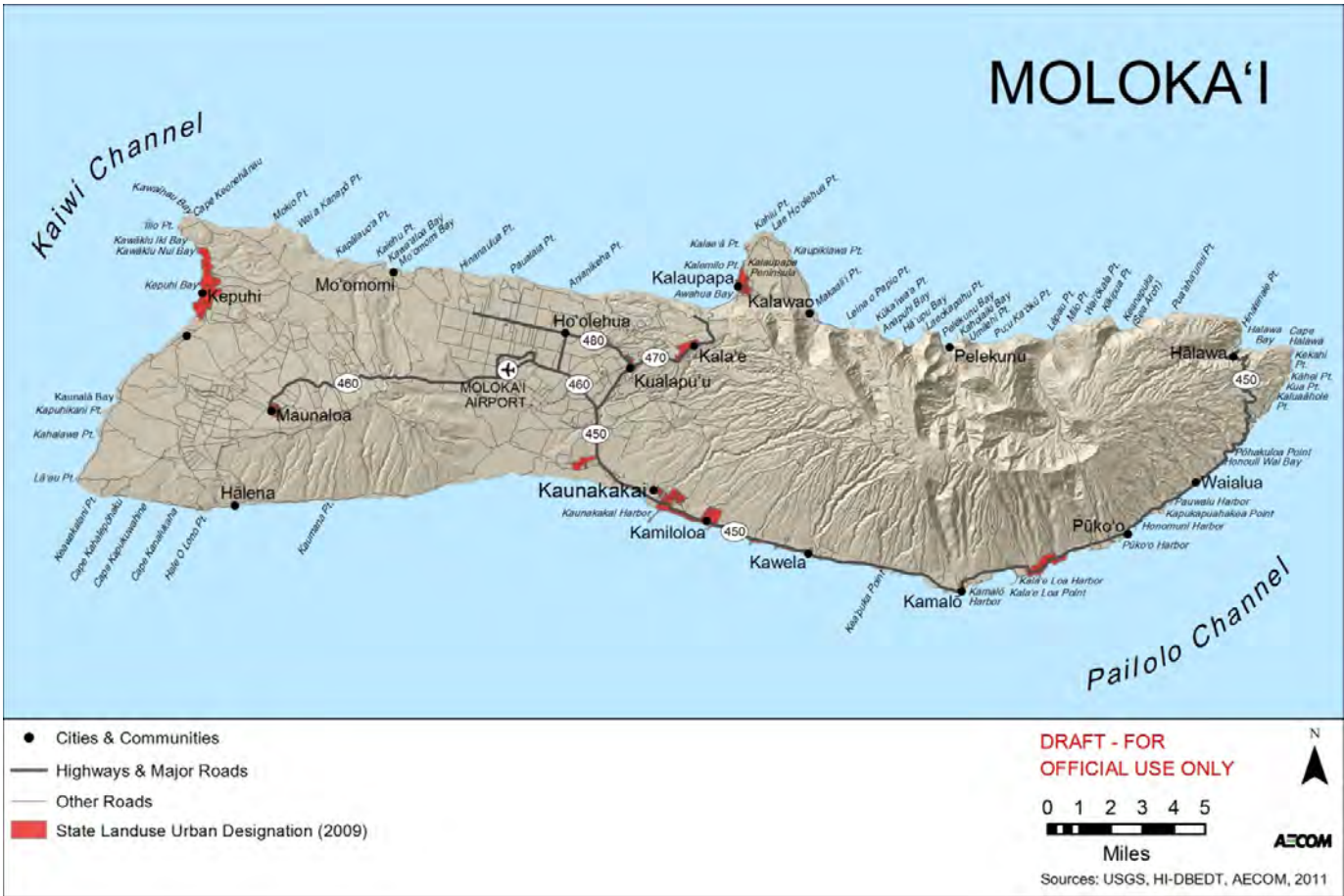


FIGURE 10

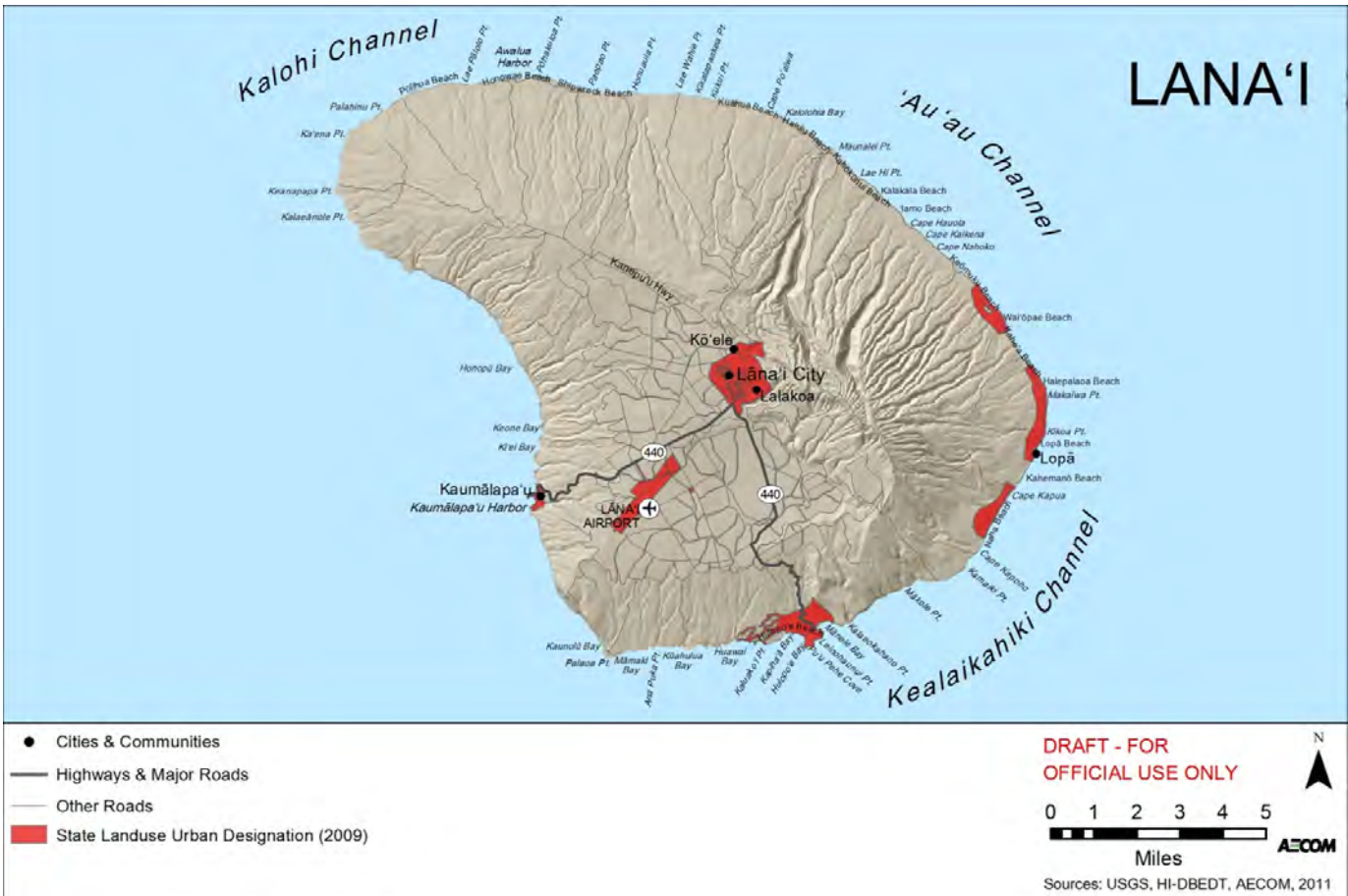


FIGURE 11

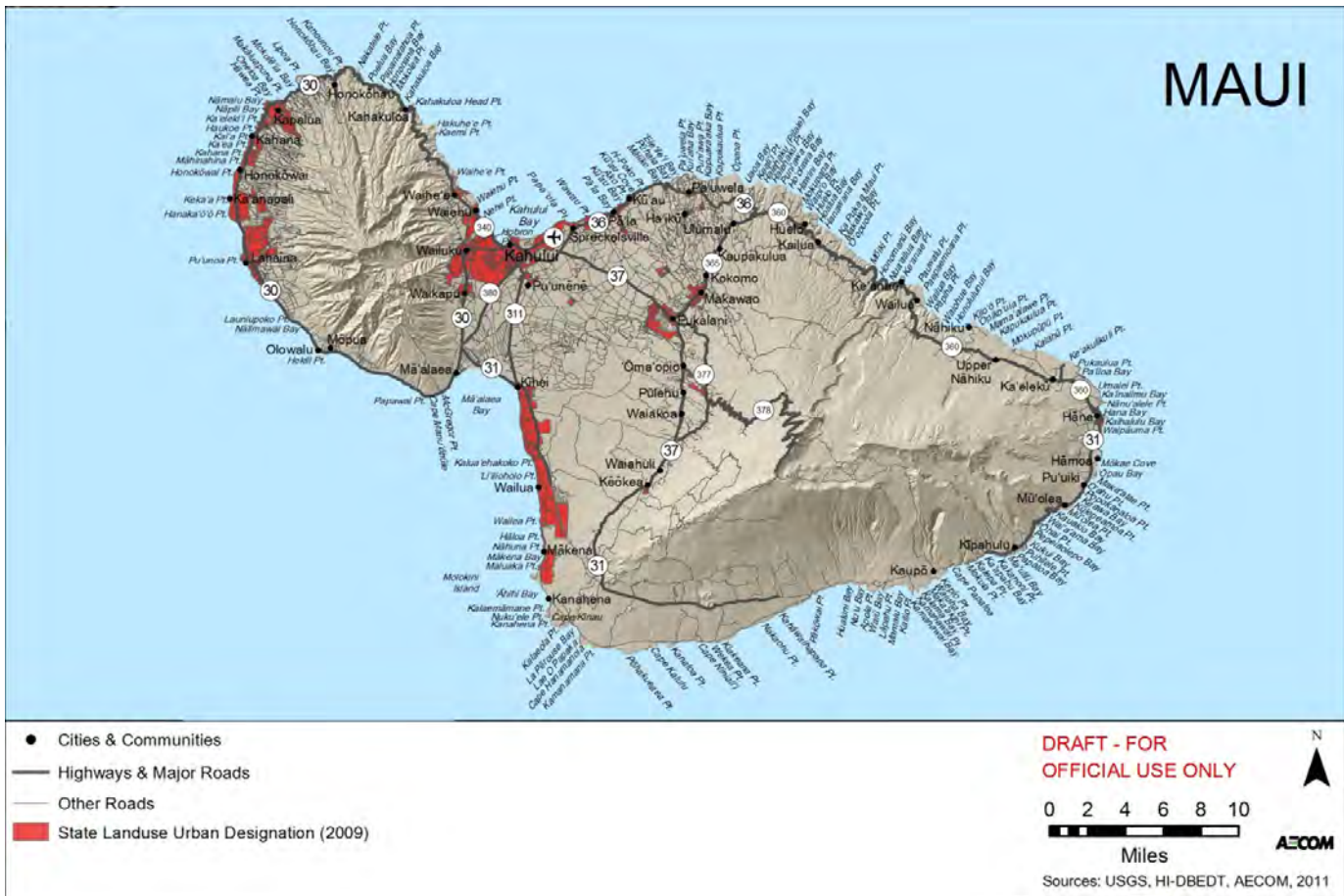


FIGURE 12

2.5. Formal “Census Designated Places”

Dense urban settlements are excluded from consideration as potential wind farm locations for reasons of public safety and project unsuitability. Densely settled concentrations of population that are identified by the U.S. Census Bureau as “census designated places” (CDPs)¹ for the project islands were evaluated. Population data were used to calculate the percentage of each CDP population relative to each island. This information was used to remove suburban areas with high population density that possibly were not captured by removing urban land use from the state land use designations. This information is shown below.

Population Density of Maui County Islands

| CDP ² | Population by CDP Area | % of the Island Population ³ |
|-----------------------|------------------------|---|
| Island of Maui | | |
| Haiku–Pauwela | 6,578 | 5.5 |
| Haliimaile | 895 | 0.76 |

¹ US Census 2005

² Maui County Data Book 2010; CDP areas do not total 100% as the numbers in this table do not include census “Division” areas.

³ AECOM 2011

| CDP ² | Population by CDP Area | % of the Island Population ³ |
|--|------------------------|---|
| Hana | 709 | 0.60 |
| Kaanapali | 1,375 | 1.17 |
| Kahului | 20,146 | 17.12 |
| Kapalua | 467 | 0.40 |
| Kihei | 16,749 | 14.24 |
| Lahaina | 9,118 | 7.75 |
| Maalaea | 454 | 0.39 |
| Makawao | 6,327 | 5.38 |
| Napili–Honokowai | 6,788 | 5.77 |
| Paia | 2,499 | 2.12 |
| Pukalani | 7,380 | 6.27 |
| Waihee–Waikapu | 7,310 | 6.21 |
| Waikapu | 1,115 | 0.95 |
| Wailea–Makena | 7,310 | 6.21 |
| Wailuku | 12,296 | 10.45 |
| Island of Moloka'i | | |
| Kaunakakai | 2,726 | 36.82 |
| Kualapu'u | 1,936 | 26.15 |
| Mauna Loa | 230 | 3.11 |
| Island of Lana'i | | |
| Lana'i City | 3,164 | 99 |
| Total Population Maui Co.² | 117,664 | |

CDPs with substantial population—set at 10% of each respective island population—are indicated by the shaded rows in the table above and shown in Figures 13, 14, and 15. Although the suggested percentage and the categorization are somewhat arbitrary, these CDPs are widely recognized as supporting denser populations than those of other CDPs on each island. The denser CDPs were eliminated from consideration because any potentially negative effects of wind farms—siting, construction, operations, and management—may be intensified due to dense settlement patterns. It is possible that good wind resources may be found in denser CDPs. However, the existing buildings, fences, and other structures in these areas may interfere with efforts to harness optimal wind and solar energy. Examples of interference include presence of structures in an energy source area; interference with other urban uses, lack of appropriate acreage, and aesthetic concerns.

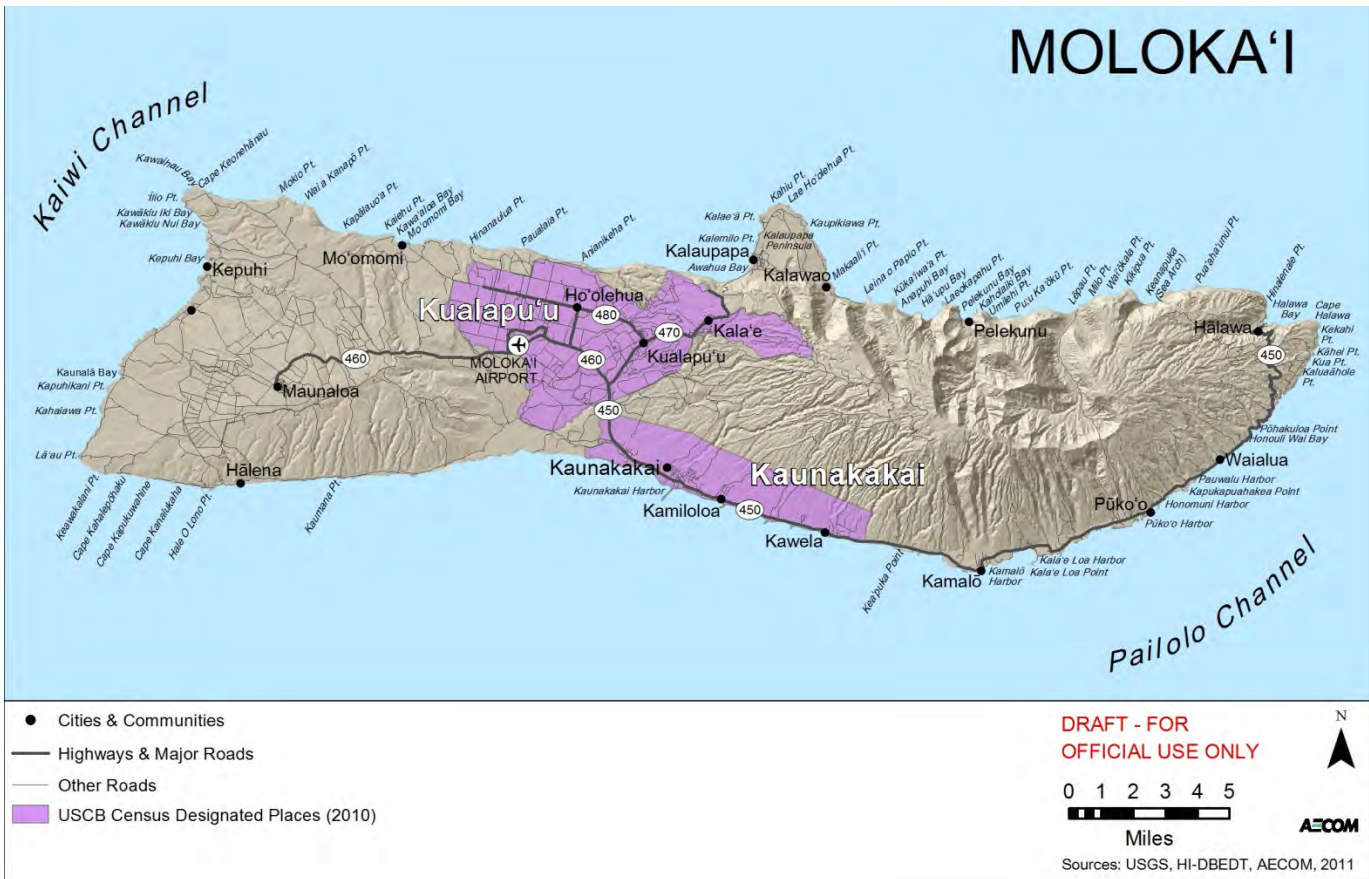


FIGURE 13

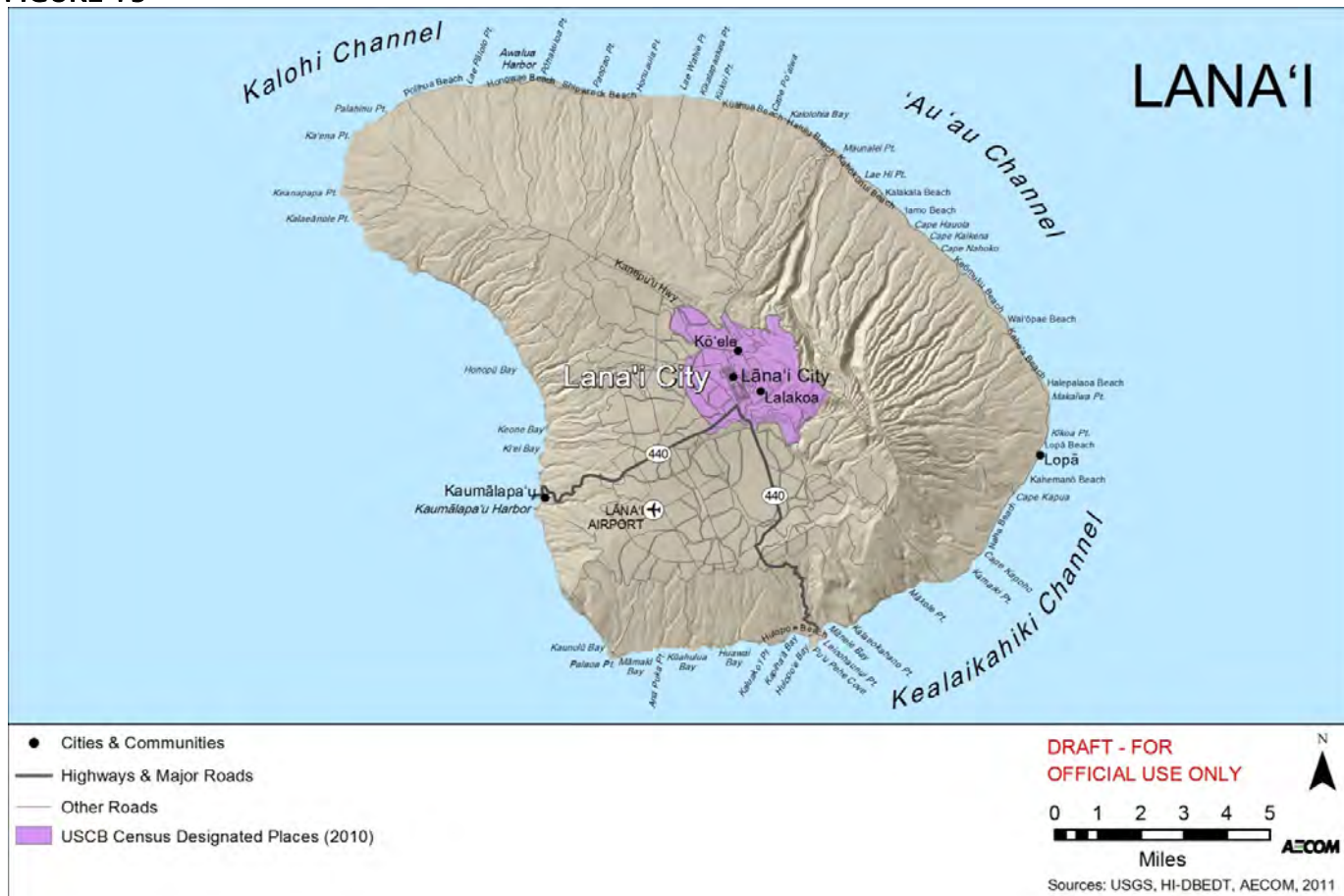


FIGURE 14

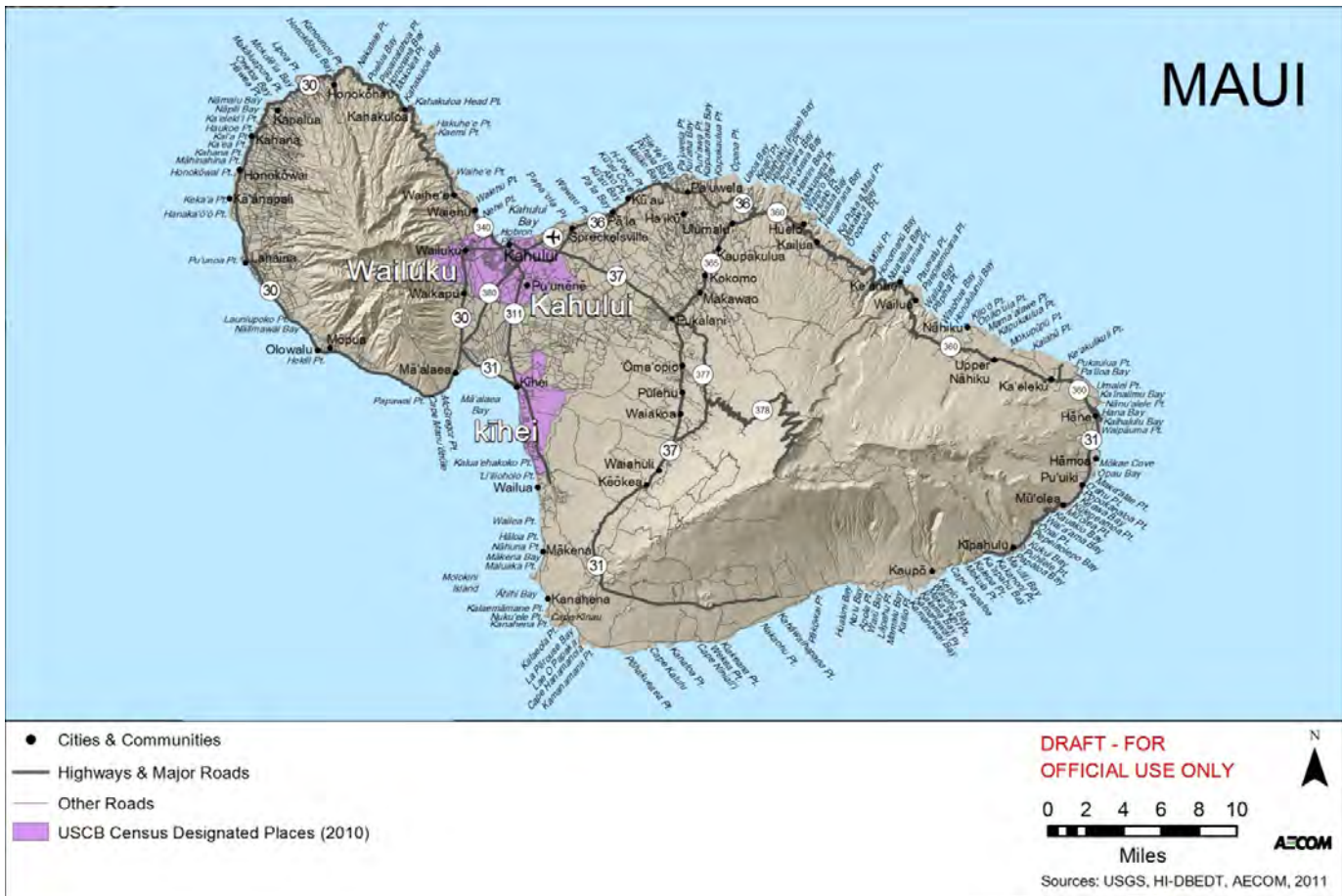


FIGURE 15

2.6. Certain Hawaiian Homelands (DHHL)

The DHHL Special District of Mo‘omomi–Anahaki on the Island of Moloka‘i was removed from consideration in the study (Figure 16). DHHL has established that:

- Within this area, there shall be no development that exceeds 30 feet in height.
- A buffer zone with a minimum 15-foot radius shall be established on all cultural sites/complexes.
- Development is prevented in the shoreline setback area.

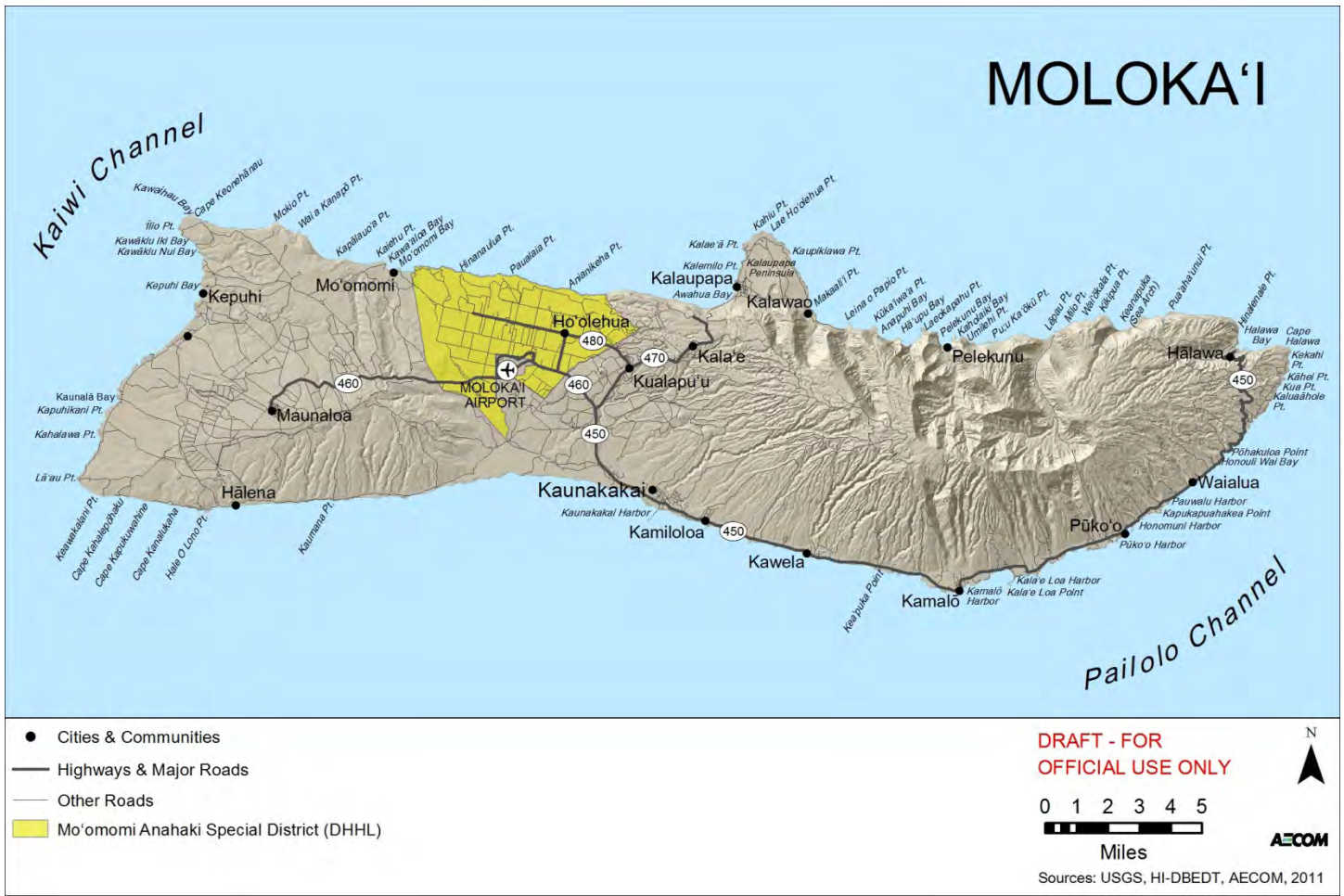


FIGURE 16

2.7. Wind Farm Size

In support of the project needs for the undersea cable, the programmatic EIS covers wind farms capable, at a minimum, of generating 50 MW of power or greater. Based on various factors below, an average site of 1,000 acres for a 50-MW operation was used as a base (Figures 17, 18, and 19). For the EIS study, this size was determined to be the minimum commercially viable project contributing to, and justifying, a proposed undersea cable as part of HIREP. This does not exclude projects of smaller size being proposed and analyzed under a nontiered EIS.

The average area size for wind farms in Hawai'i (where statistics are known) is 15 acres per megawatt. This translates to a minimum parcel size of 750 acres for a 50-MW operation. Of the 161 commercial wind projects with total land use area data (NREL) on the mainland, 125 (representing 80% of the evaluated capacity) have reported areas of between 21 and 125 acres per megawatt. The chart below outlines some statistics on wind farm size in Hawai'i.

| | | | |
|---|--|--|--|
| <p><u>Commercial Wind Farms in Hawai'i – Existing and Proposed</u></p> | <p>Hāwī Big Island</p> <p>10.5 MW 16 wind turbines Area: undetermined</p> | <p>Au'ahi/Ulupalakua Maui– proposed</p> <p>22 MW 15 wind turbines Area: 120 acres</p> | <p>Castle and Cooke Lana'i –proposed</p> <p>300–400 MW 100–200 turbines Area:9,000–12,800 acres</p> |
| <p>Kahe'awa Maui</p> <p>30 MW 20 wind turbines Area: 507 acres</p> | <p>Pakini Nui Big Island</p> <p>20.5 MW 14 wind turbines Area: undetermined</p> | <p>Kahūkū O'ahu</p> <p>30 MW 12 wind turbines Area: 578 acres</p> | <p>Kawailoa O'ahu – proposed</p> <p>70 MW 43 wind turbines Area: 550–650 acres</p> |

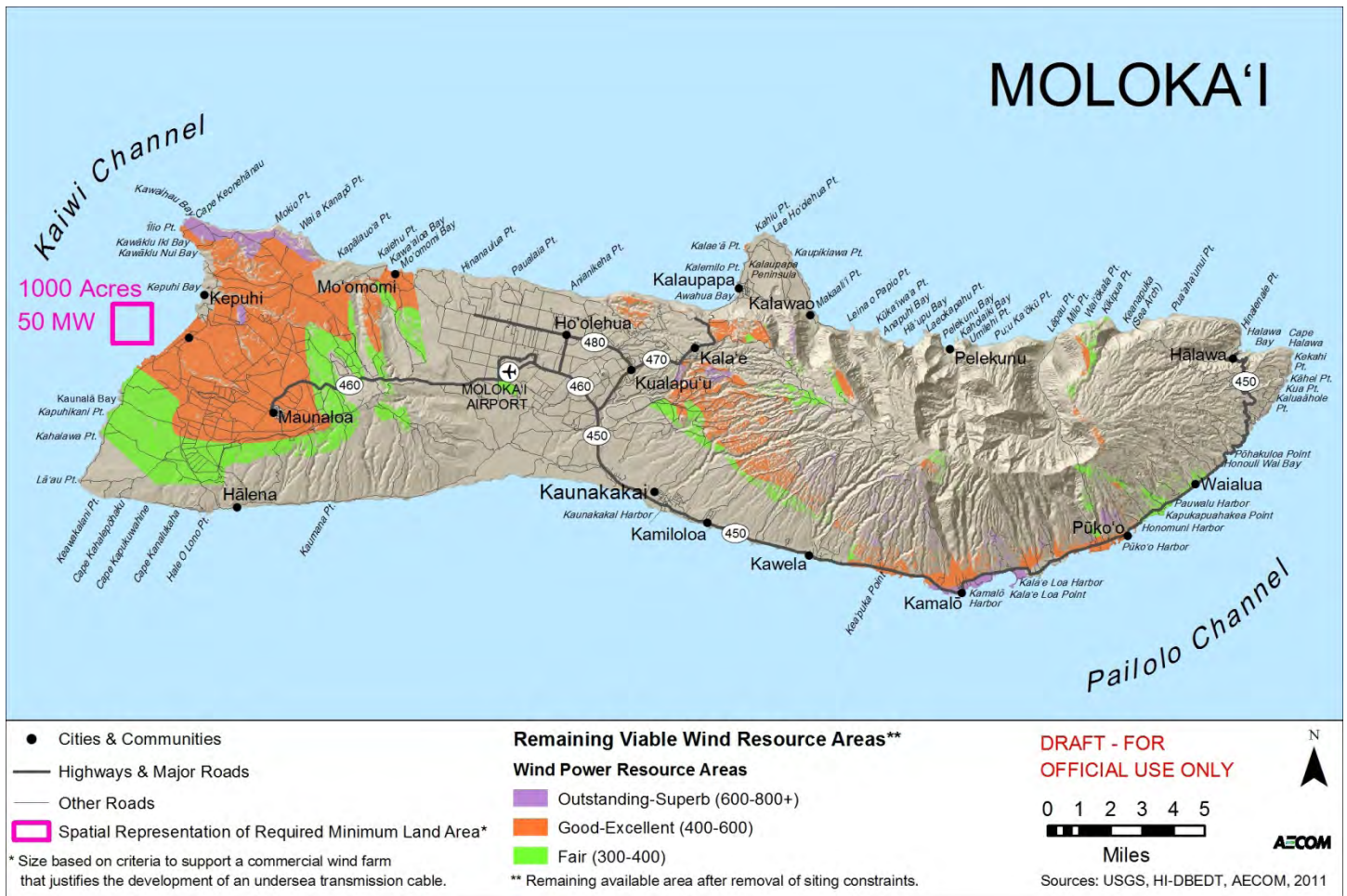


FIGURE 17

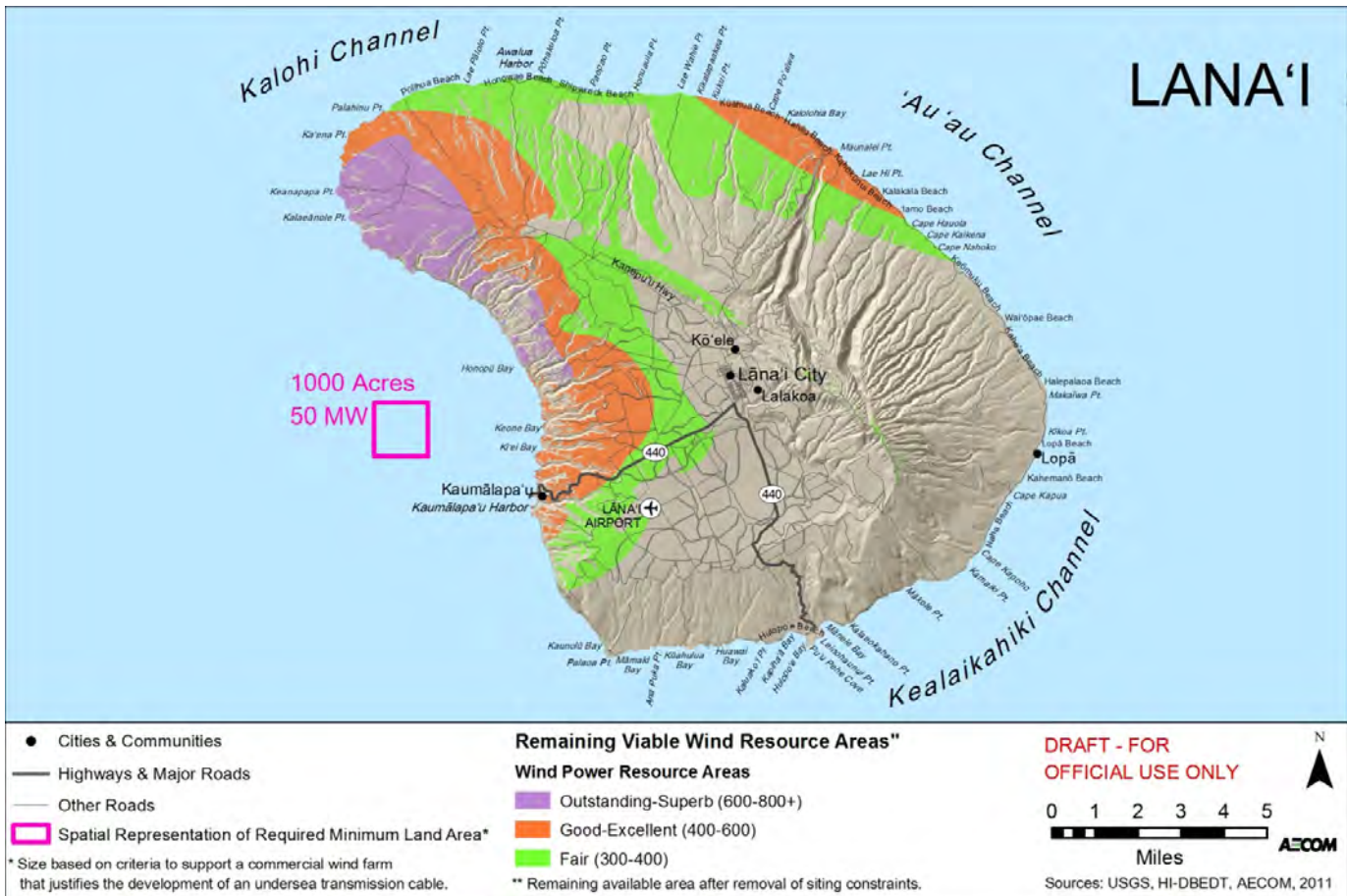


FIGURE 18

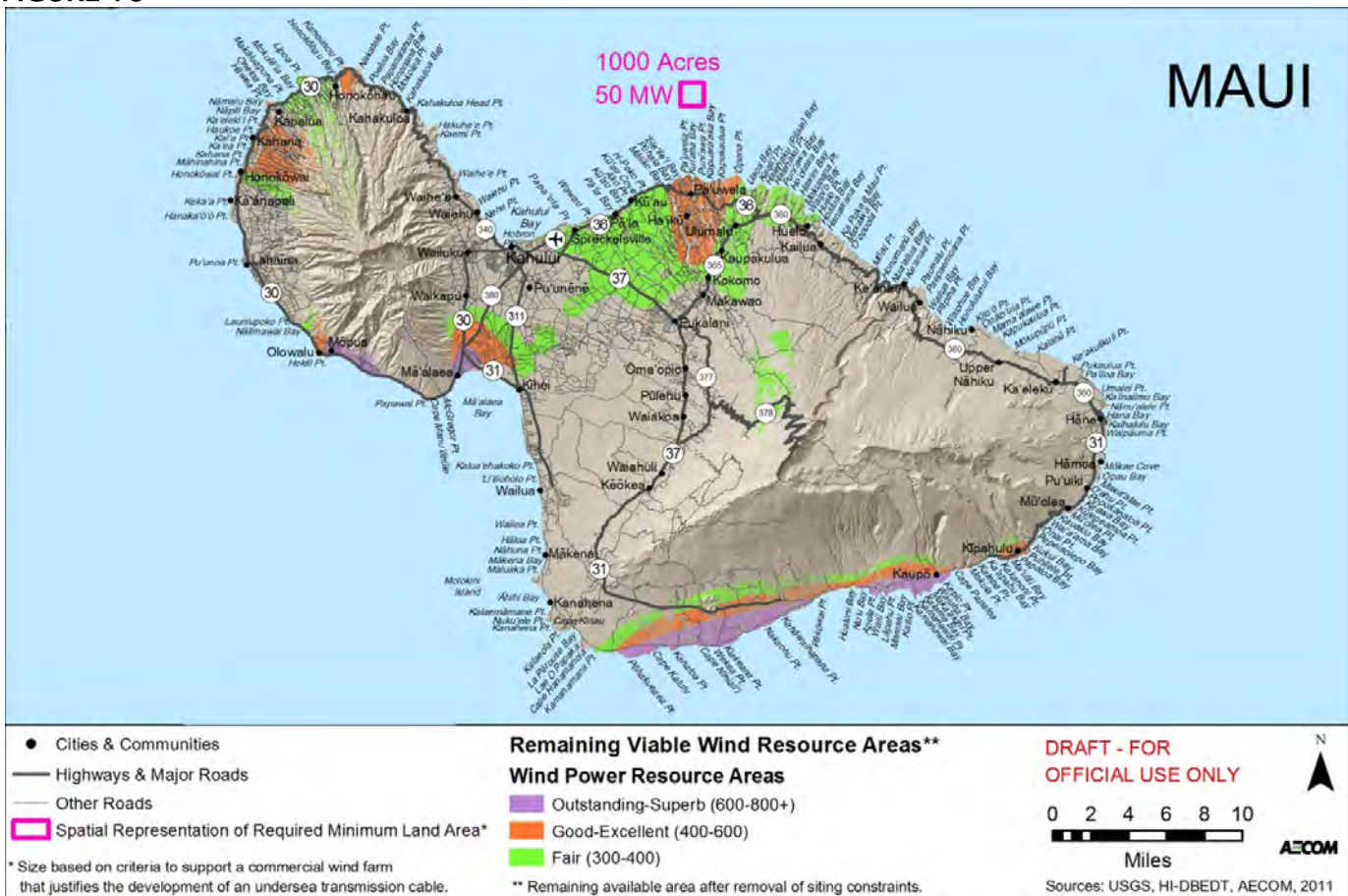


FIGURE 19

2.8. HIREP Programmatic EIS Wind Resource Study Areas

The HIREP Wind Resource Study areas were determined by a GIS overlay process that removed the previously covered constraints (slope, reserves, land area requirements, etc.), which resulted in a map showing the remaining viable wind resources areas (see Figures 17, 18, and 19). As mentioned in the slope discussion, the study areas were slightly generalized to avoid splintered areas and to facilitate a more generalized approach taken with a programmatic EIS. These areas may still contain small areas where the slopes exceed 20% or small urban in-holdings that will ultimately need evaluation at the site-specific EIS level. Figures 20, 21, and 22 show the HIREP Wind Resource Study Areas defined by this criteria-based study area selection process.

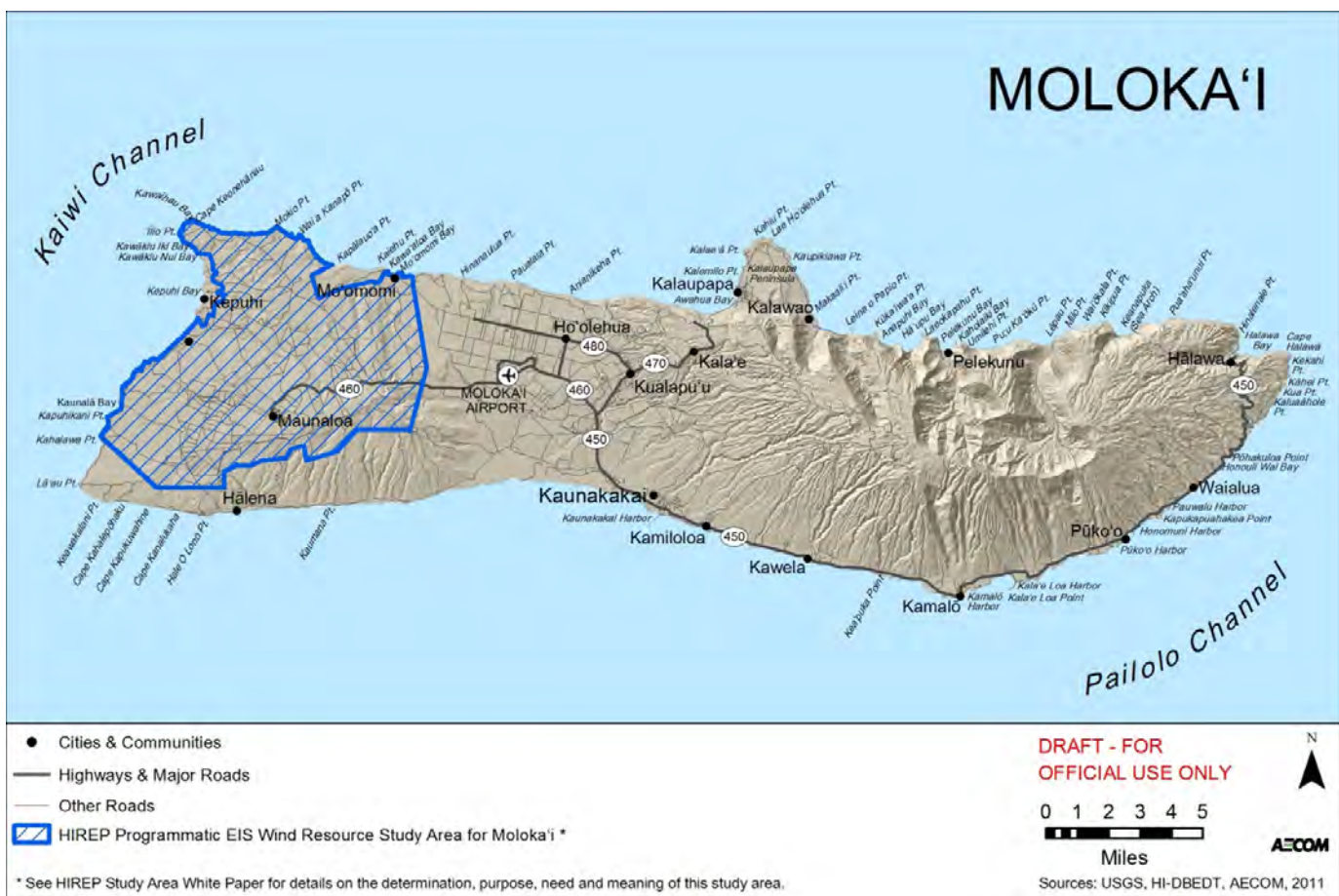


FIGURE 20

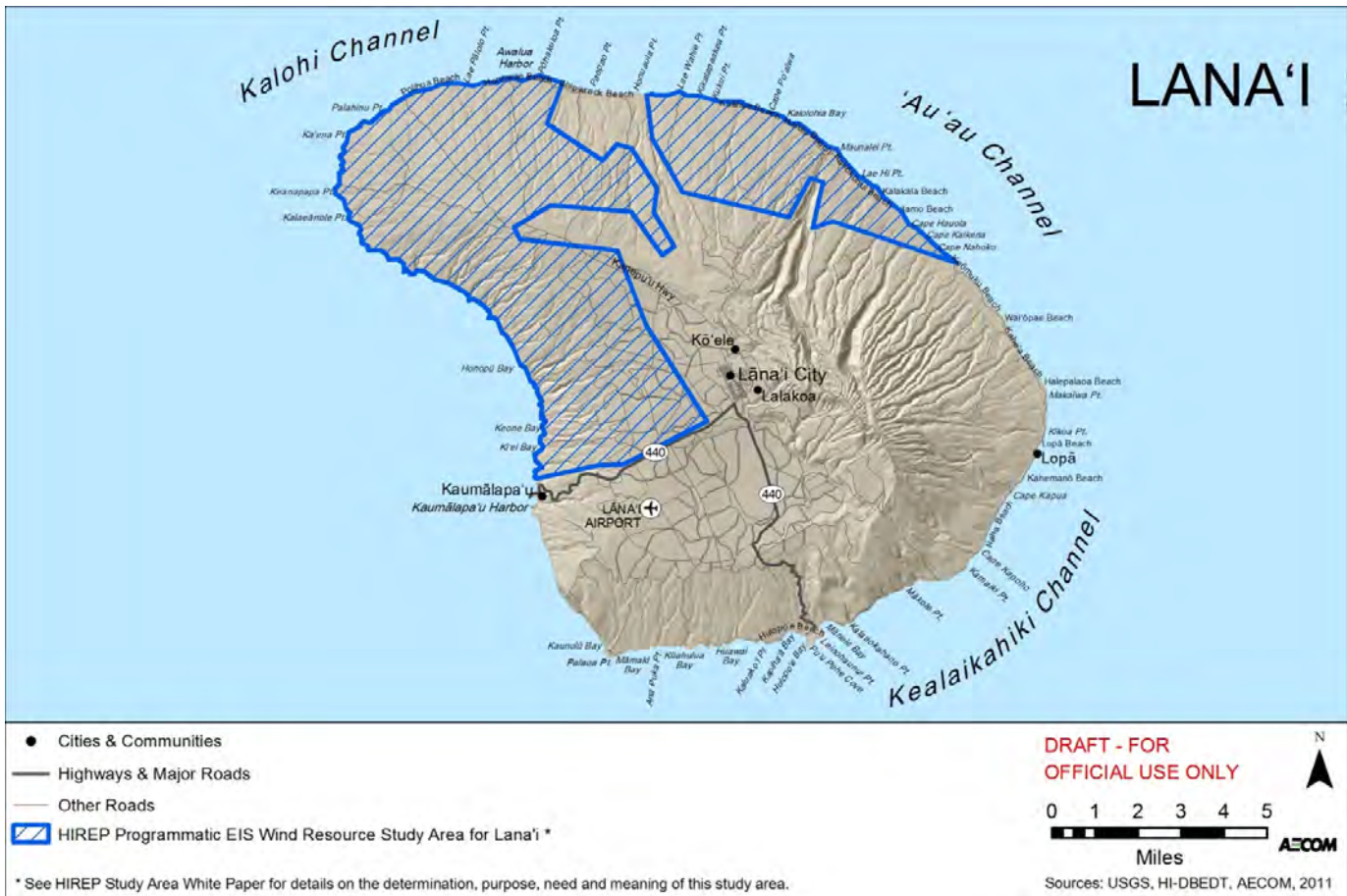


FIGURE 21

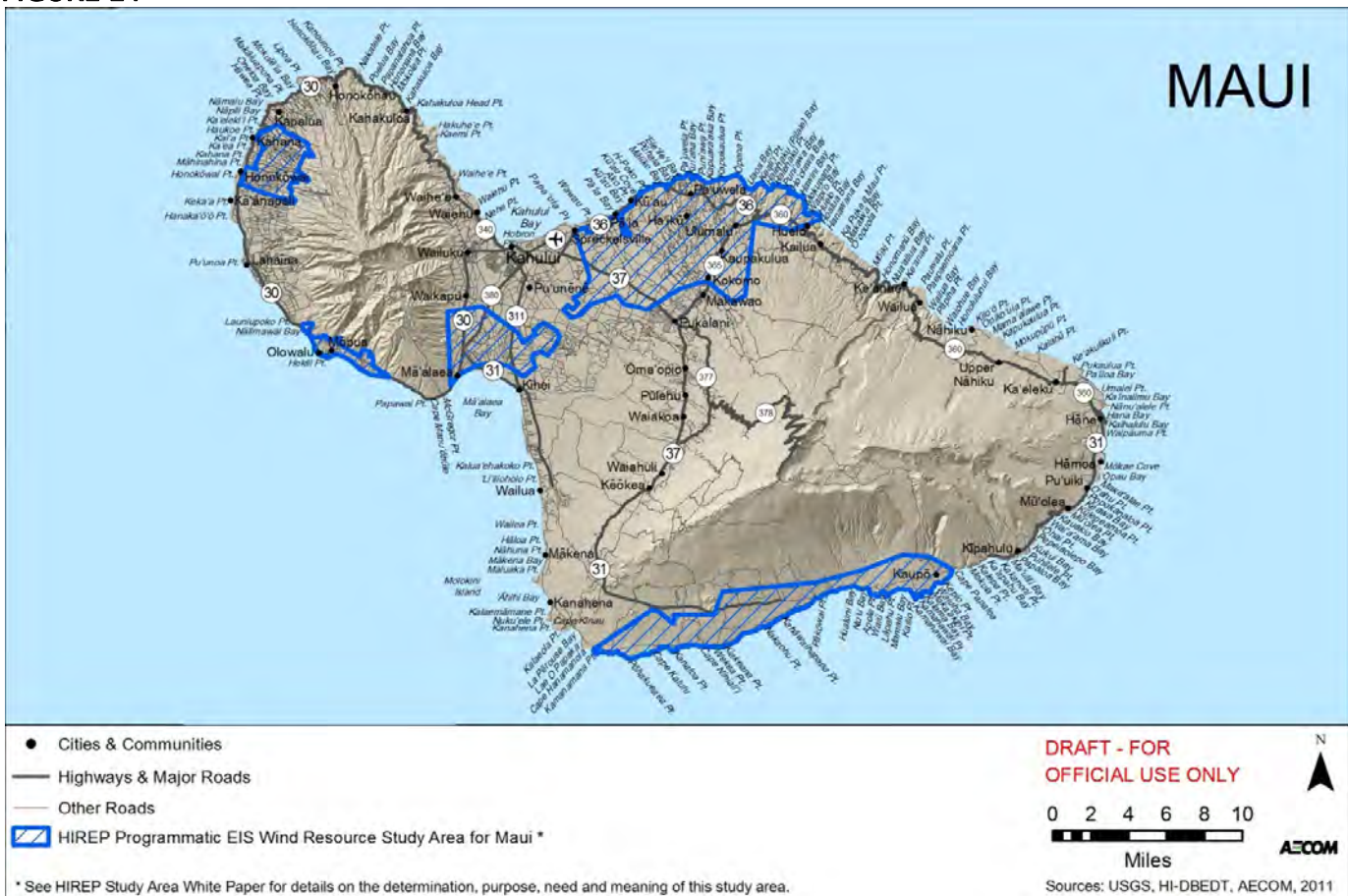


FIGURE 22

3. Commercial Solar Development Study Area Criteria

3.1. Solar Data

As part of this effort and evaluation, existing solar data from both NREL and State data sources were reviewed. Due to the lack of appropriately scaled data and because of questions related to the quality of the data for the purposes of this EIS effort, use of these data was rejected. It was decided that the following siting criteria would be adequate to determine reasonable solar study areas for the HIREP Programmatic EIS.

3.2. Average Slopes

For solar installations, the industry average generally assumes that functionally optimum installations require slopes less than 3%. While NREL suggests this 3% slope, application of a 3% threshold to the project islands resulted in severely restricted potential project areas. It was determined that 5% would be acceptable as it allows flexibility and a more realistic project study area, while accounting for Hawai'i's challenging island topography (Figures 23, 24, and 25). While baseline slopes were established for solar areas for planning purposes for the EIS, it is understood that slope acceptability is incremental and not absolute.

NOTE: In some areas of the HIREP study area boundaries, slope may exceed 5%. These areas were left in the study area to maintain cohesion between larger surrounding areas that were below 5%. In some cases, a commercial solar farm may be viable built on terraces along sloped areas. Due to this consideration, some areas fragmented by this terracing slope effect were left in the study area as viable solar development areas. It is assumed that follow-on project-specific EIS efforts will consider and address any slope constraints at the site level.

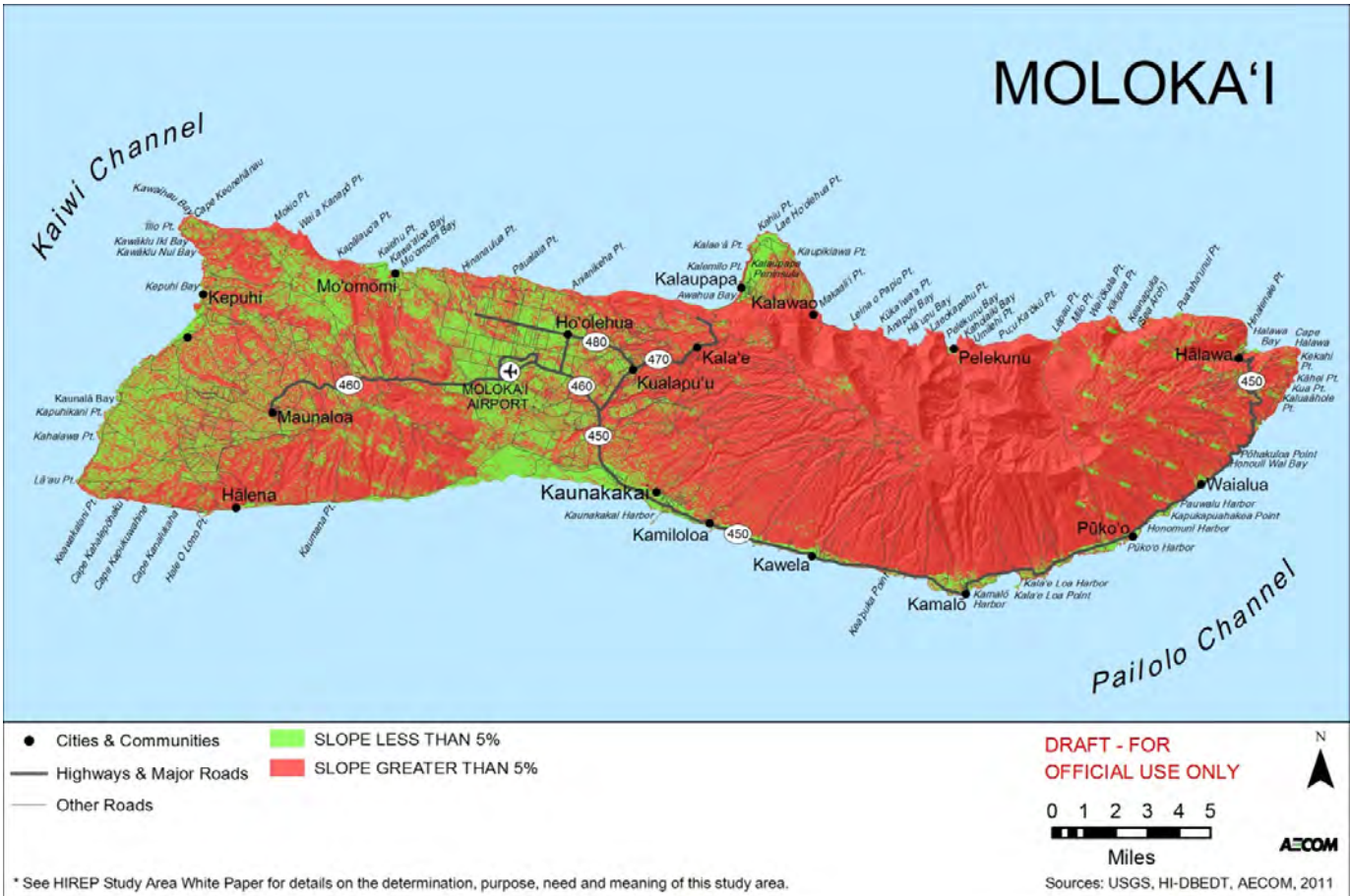


FIGURE 23

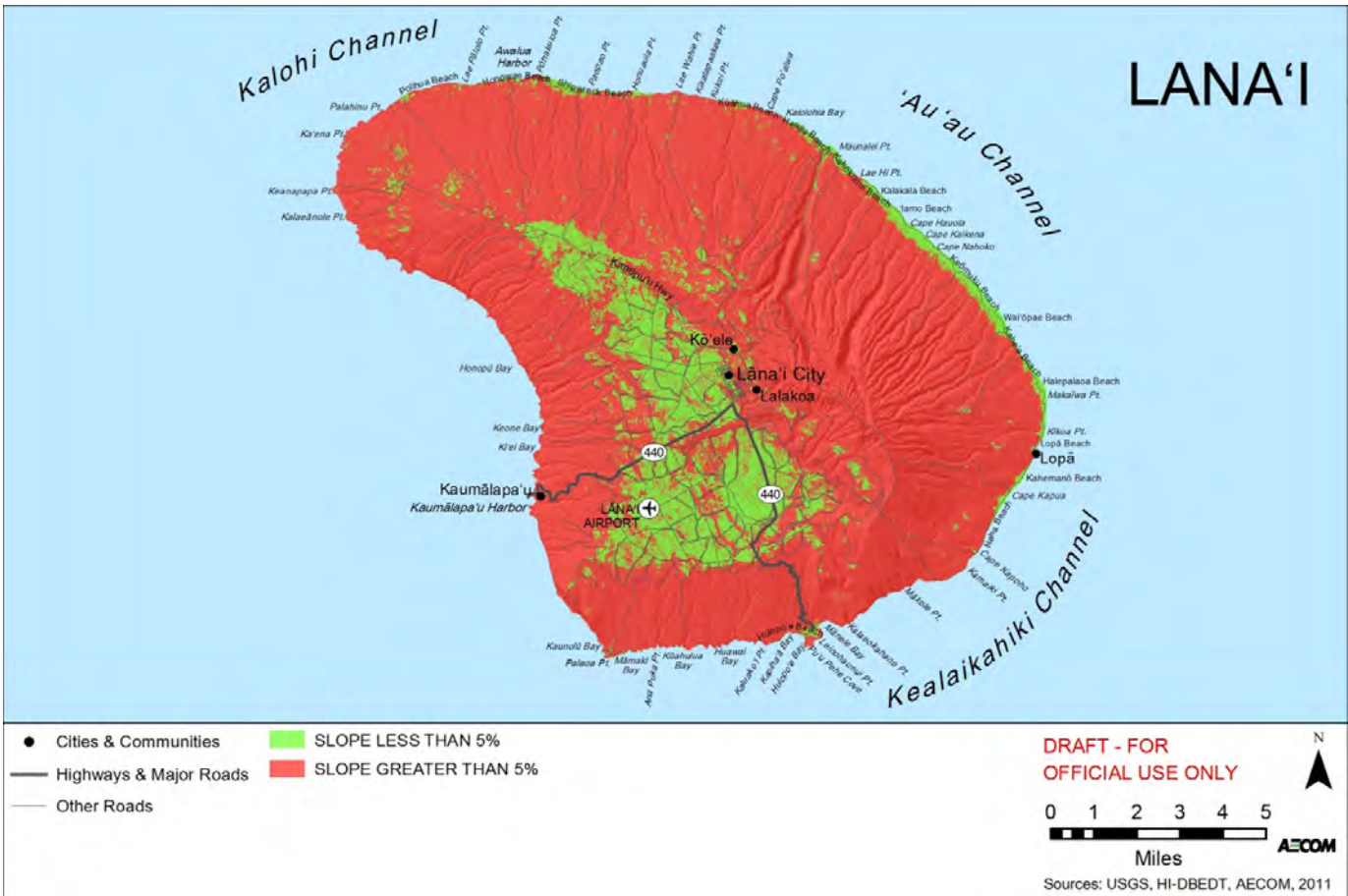


FIGURE 24

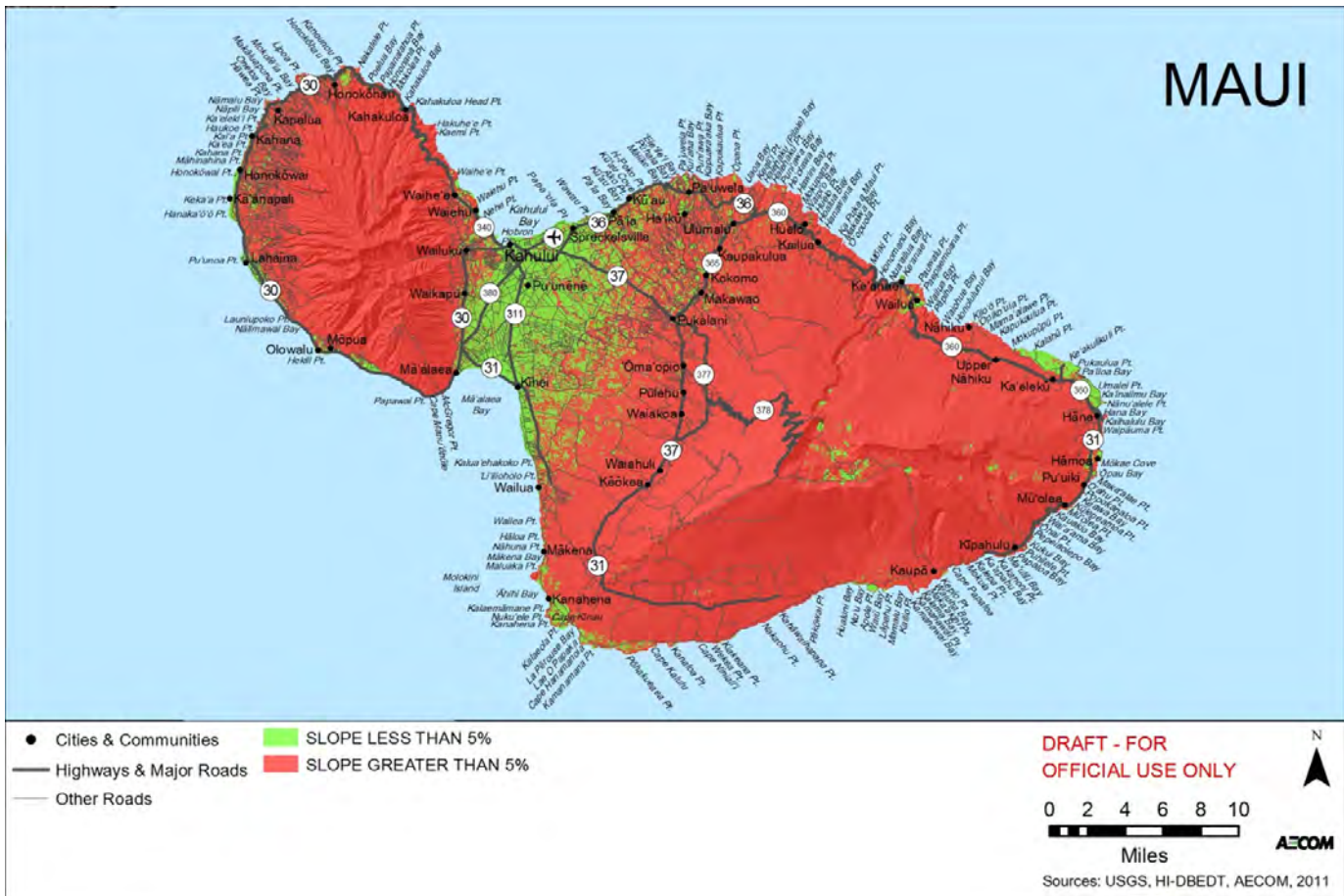


Figure 25

3.3. Officially Designated Reserves, National Parks, State Preserves, Sanctuaries, and other Protected Lands

As discussed previously in Section 2.3, the criteria used for excluding reserves for wind resources areas were also applied for solar resource areas (see Figures 7, 8, and 9).

3.4. Areas with a State Land Use Designation of “Urban”

As discussed previously in Section 2.4, the criteria used for excluding State Land Use Urban Designations for wind resources areas were also applied for solar resource areas (see Figures 10, 11, and 12).

3.5. Formal “Census Designated Places”

As discussed previously in Section 2.5, the criteria used for excluding CDPs for wind resources areas were also applied for solar resource areas (see Figures 13, 14, and 15).

3.6. Certain Hawaiian Homelands (DHHL)

As discussed previously in Section 2.6, the criteria used for excluding CDPs for wind resources areas were also applied for solar resource areas (see Figure 16).

3.7. Commercial Solar Farm Size

In support of the project needs for the undersea cable, the programmatic EIS covers solar farms capable of generating 100 MW or greater. Absent industry or NREL information concerning solar installations in Hawai'i, it was determined that the study area for solar installations would be a minimum 500-acre site to support a 100-MW installation (Figures 26, 27, and 28). For the EIS study, this was determined to be the minimum commercially viable project contributing to, and justifying, a proposed undersea cable as part of HIREP. This does not prevent projects of smaller size being proposed and analyzed under a nontiered EIS.

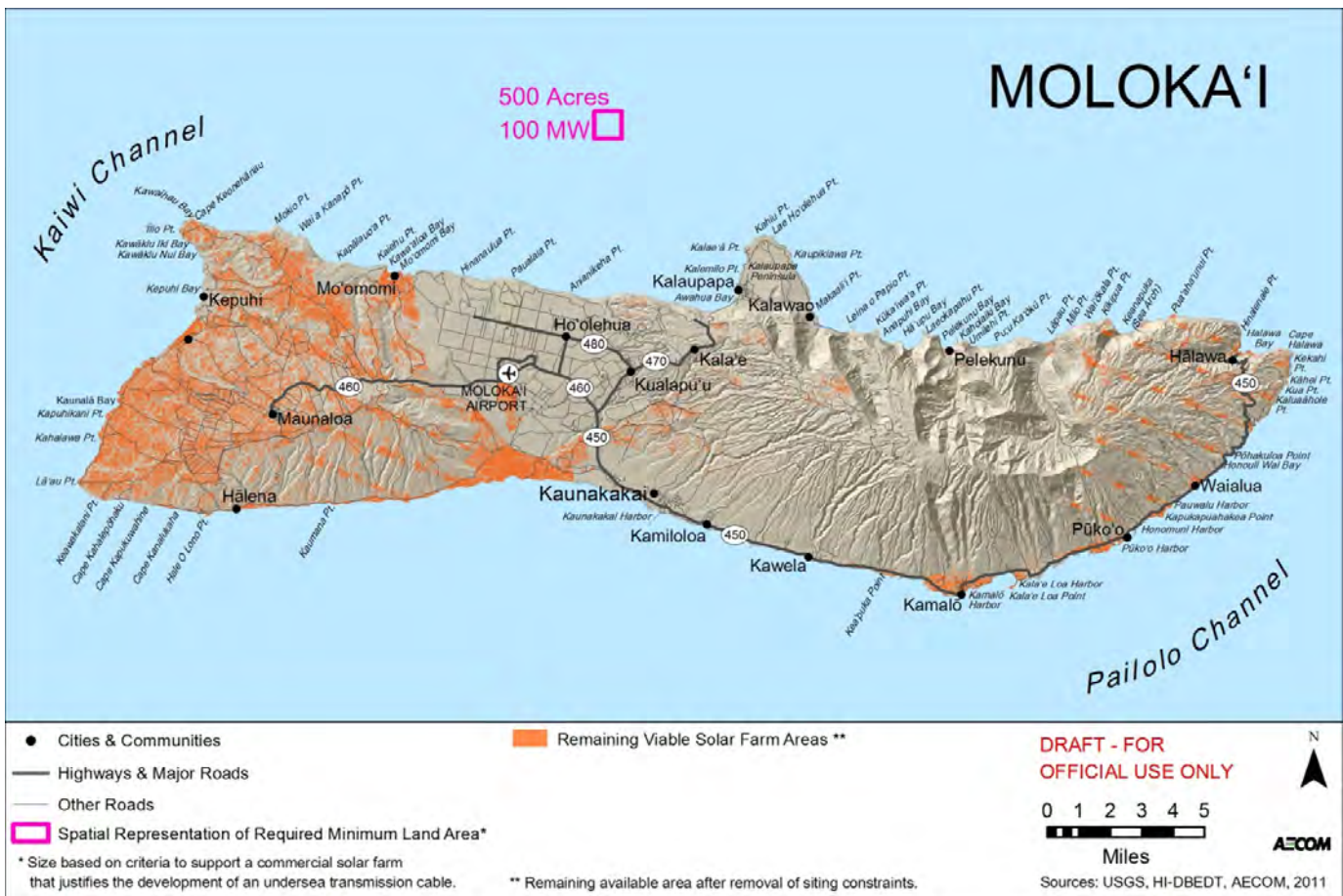


FIGURE 26

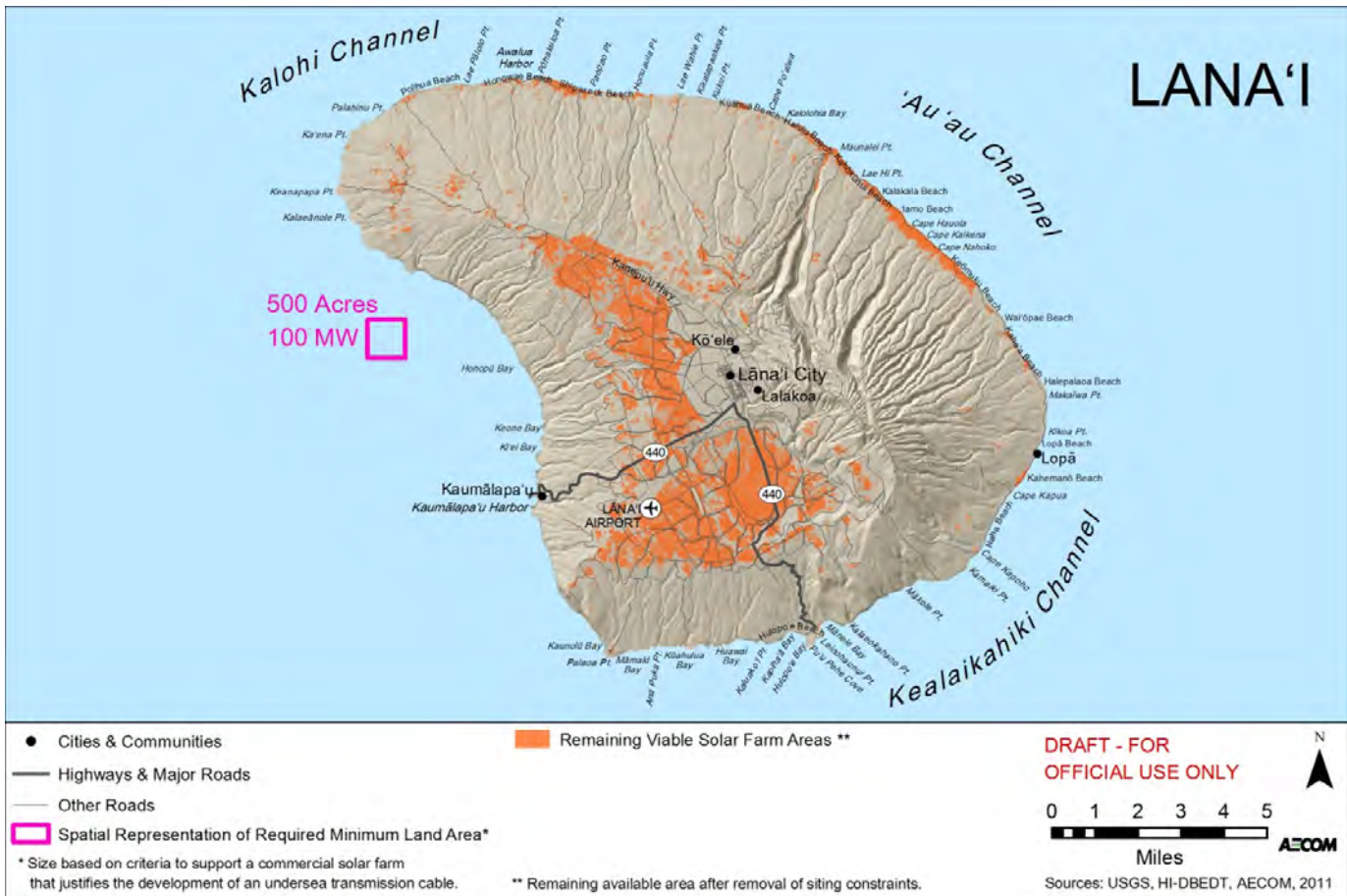


FIGURE 27

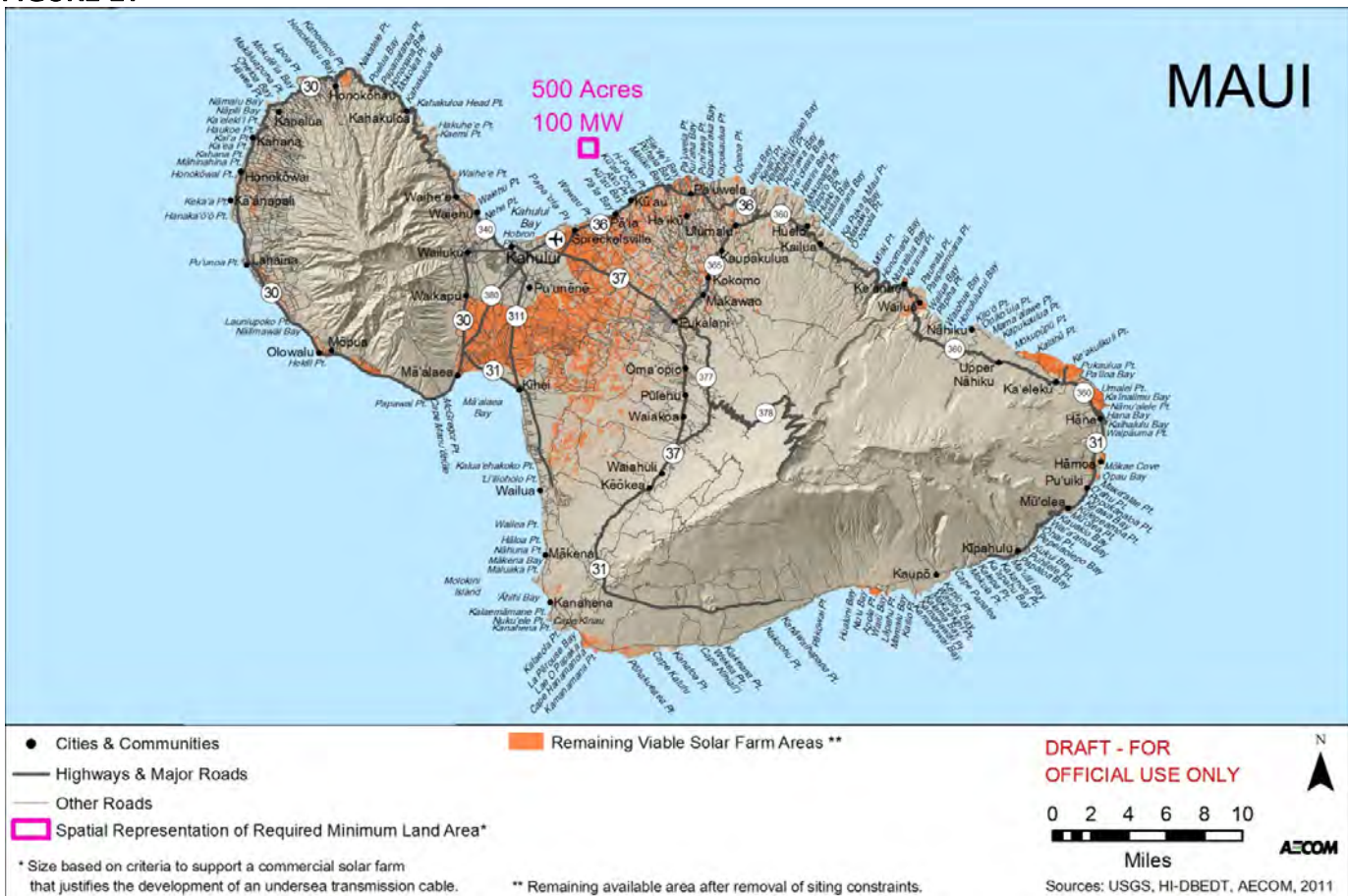


FIGURE 28

3.8. HIREP Programmatic EIS Solar Resource Study Areas

The HIREP Solar Resource Study areas were determined by a GIS overlay process that removed the previously covered constraints (slope, reserves, land area requirements, etc.), which resulted in a map showing the remaining viable wind resources areas (see Figures 26, 27, and 28). As mentioned in the slope discussion, the study areas were slightly generalized to avoid splintered areas and to facilitate a more generalized approach taken with a programmatic EIS. These areas may still contain small areas where the slopes exceed 5% or other constraints that will ultimately need evaluation at the site-specific EIS level. It should be noted that the Hana town region in Maui was removed from consideration as it is the current site of the Hana airport and accessibility to this site would be extremely difficult. Figures 29, 30, and 31 show the HIREP Solar Resource Study Areas defined by this criteria-based study area selection process.

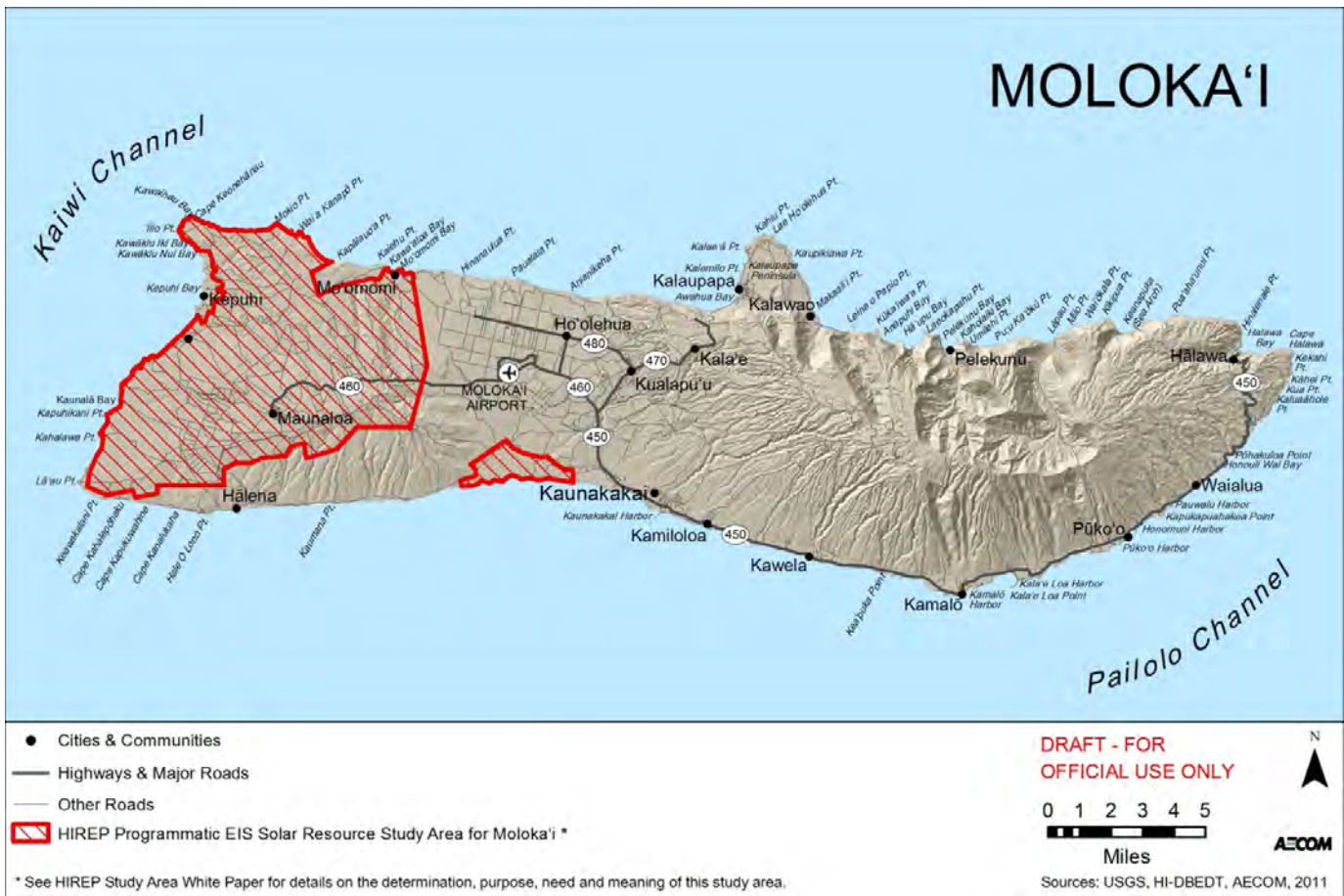


FIGURE 29

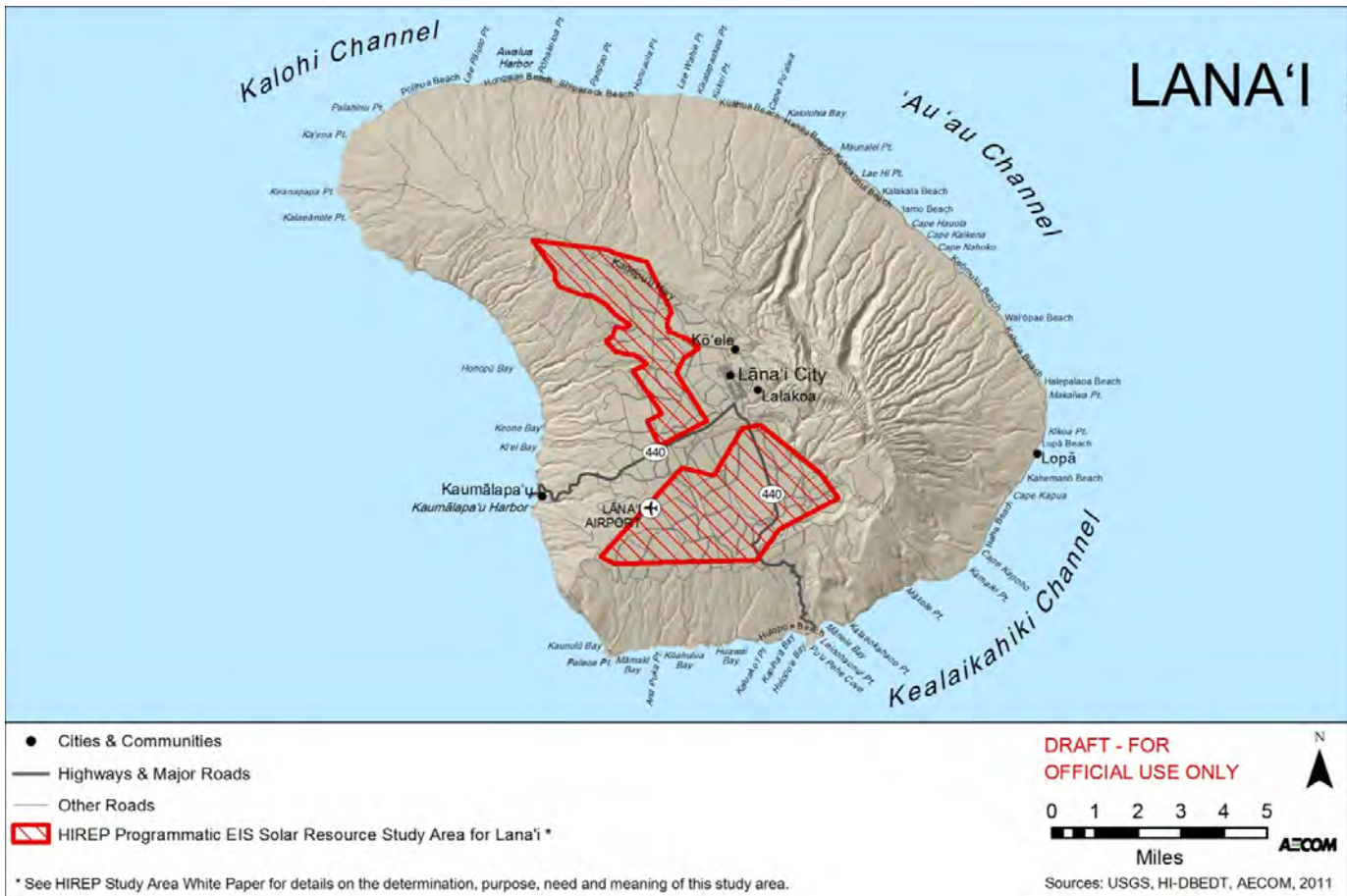


FIGURE 30

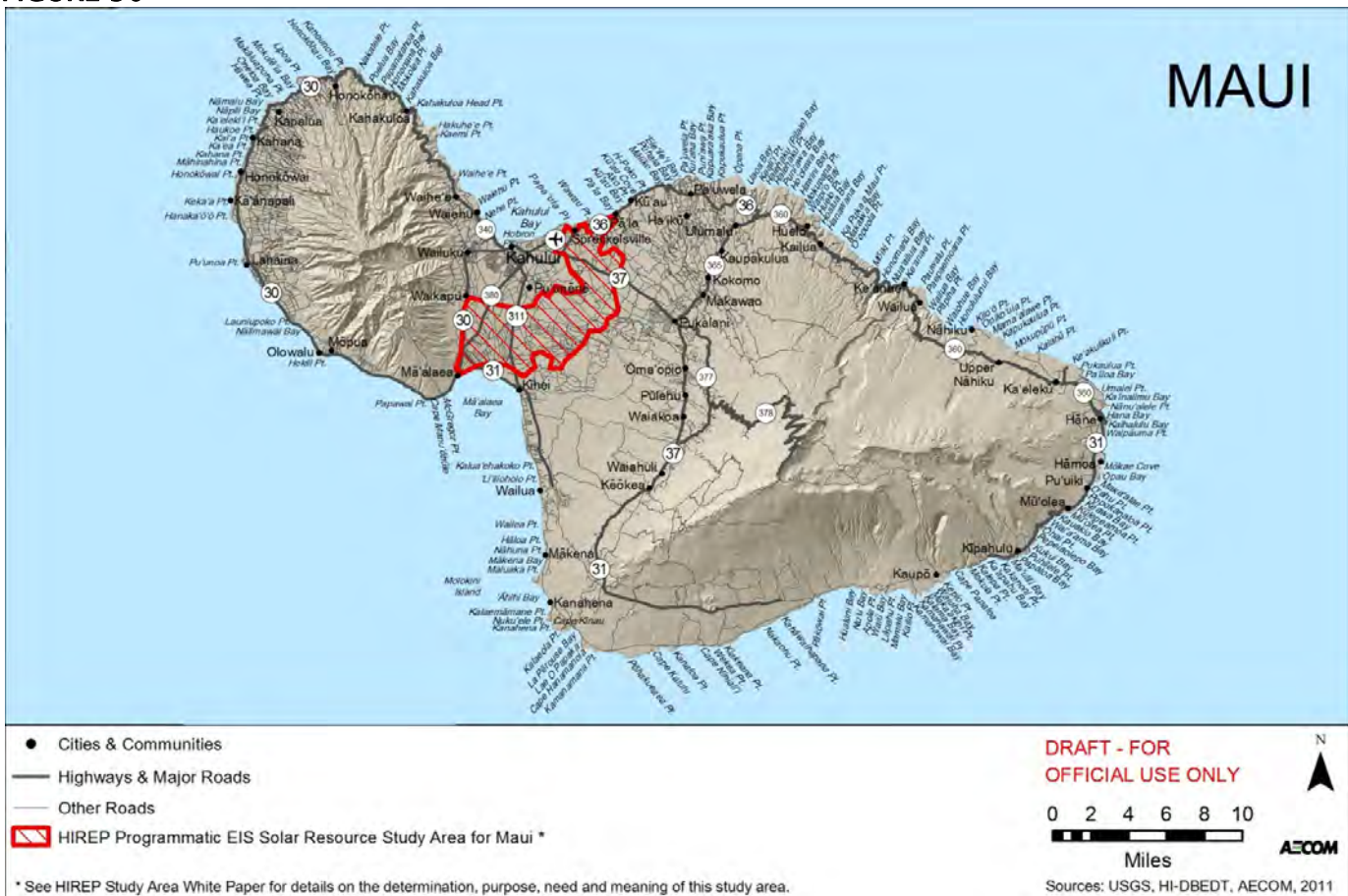


FIGURE 31

4. Commercial Geothermal Development Study Area Criteria

In 1961, Act 187 vested the Department of Land and Natural Resources with jurisdiction over the Conservation District, the ability to formulate subzones within the Conservation District, and the ability to regulate land uses and activities therein. Under Hawai'i state law (HRS, Section 205-5.2), the State Board of Land and Natural Resources reviews and designates potential geothermal resource subzones, based on a range of factors. Among the islands associated with the HIREP EIS, there is only one designated geothermal resource subzone. It is located on the south side of the island of Maui east of Wailea and extends from near the shoreline mauka toward Hale'akala National Park (Figure 34). The designation of the area as a geothermal resources subzone by the State of Hawai'i was the only filtering criterion that impacted selection of the geothermal zone. The filtering criteria utilized for wind and solar, when applied to the geothermal designation, did not impact the site selection. This area is not constrained by slope conditions and other criteria used for wind and solar did not affect the geothermal energy resource area.

5. HIREP Programmatic EIS Renewable Energy Resource Study Areas

The HIREP Programmatic EIS will evaluate several renewable energy options, including wind, solar, and geothermal resources on the islands of Moloka'i, Lana'i, and Maui. Ultimately, all resource areas and landing sites will be incorporated into a consolidated HIREP Programmatic EIS Resource Study Area that will contain all areas eligible for tiered-off, site-specific EIS processes. Figures 32, 33, and 34 show a composite of the resources areas, with the landing site areas TBD.

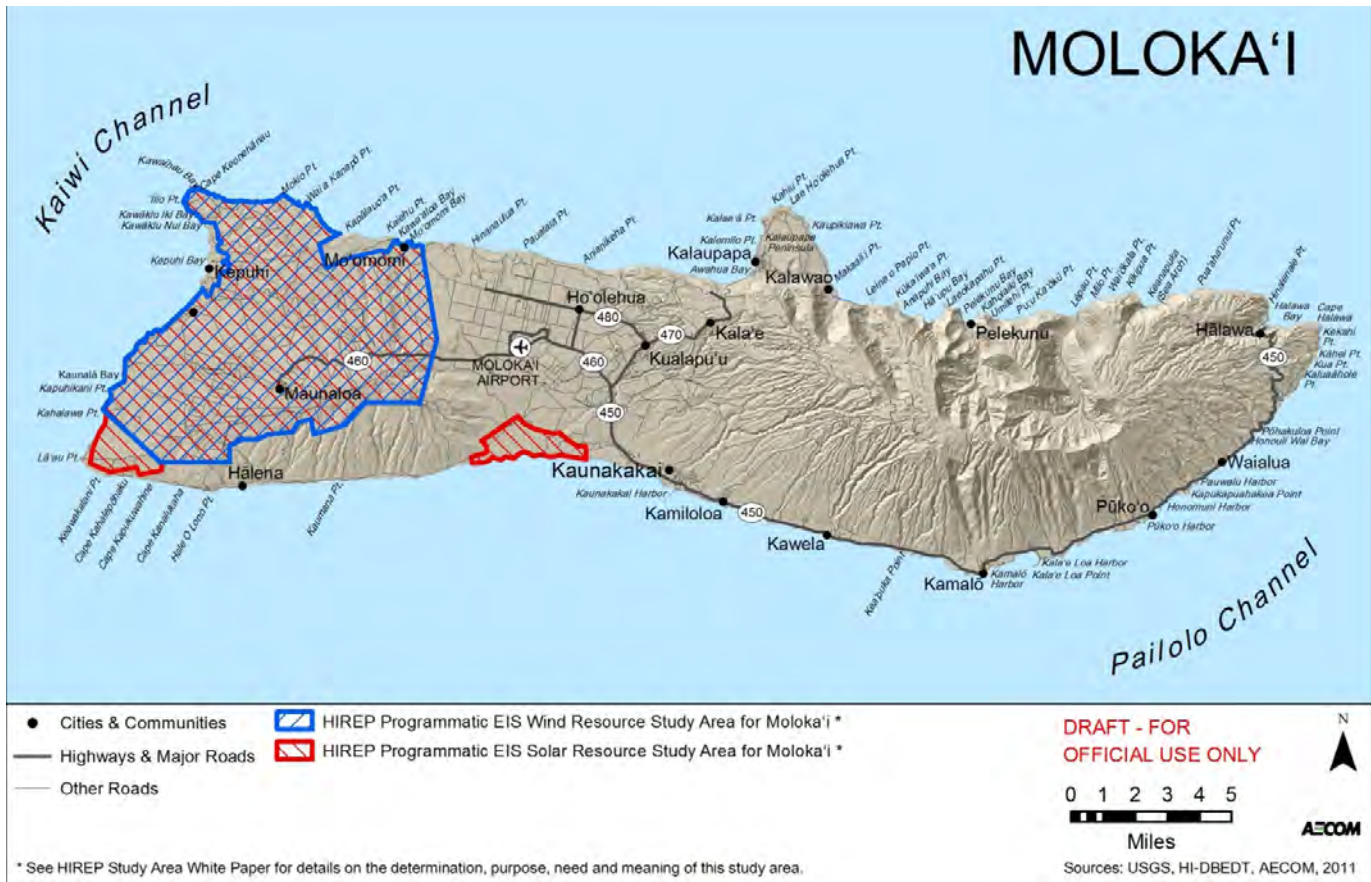


FIGURE 32

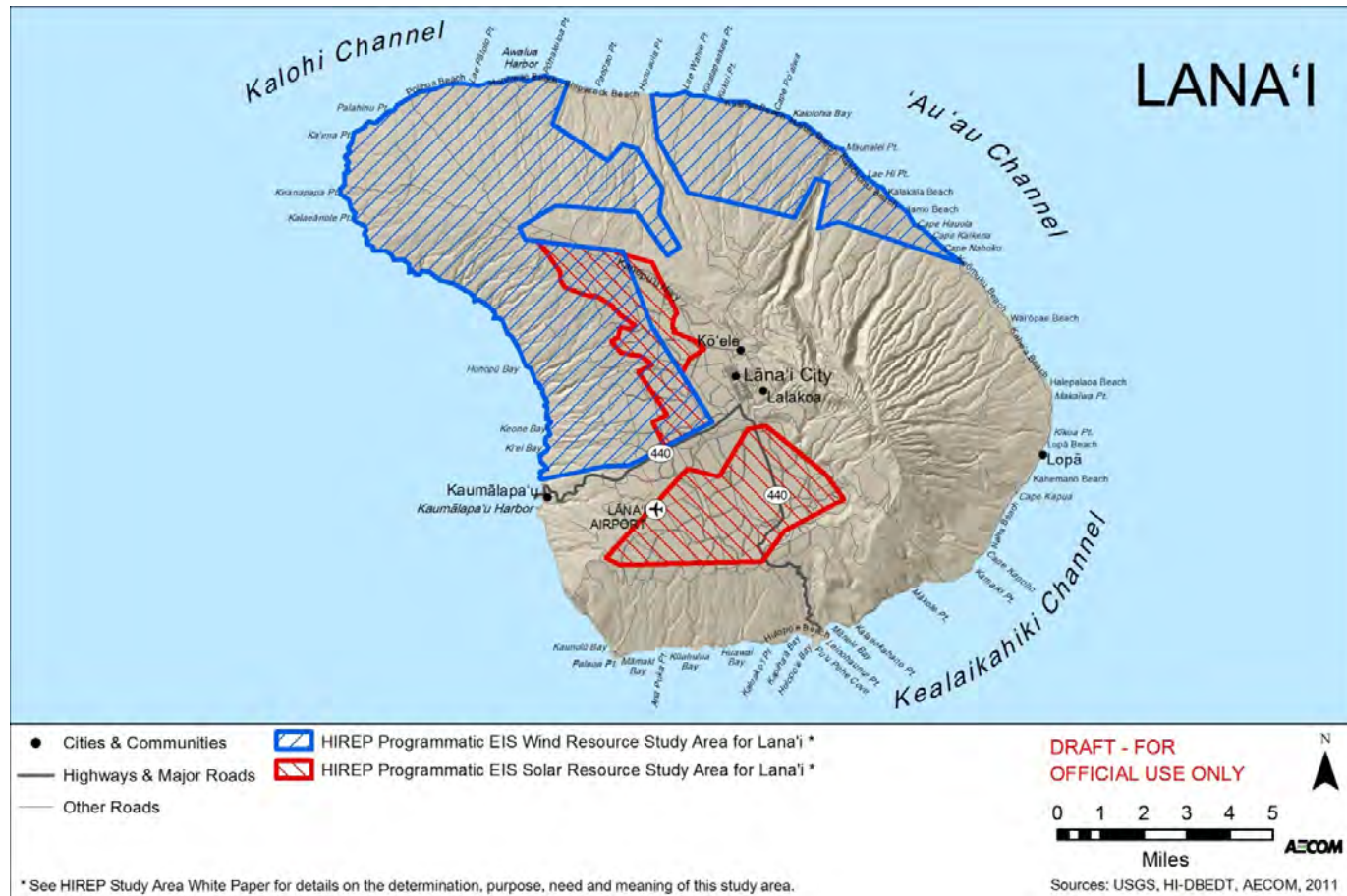


FIGURE 33

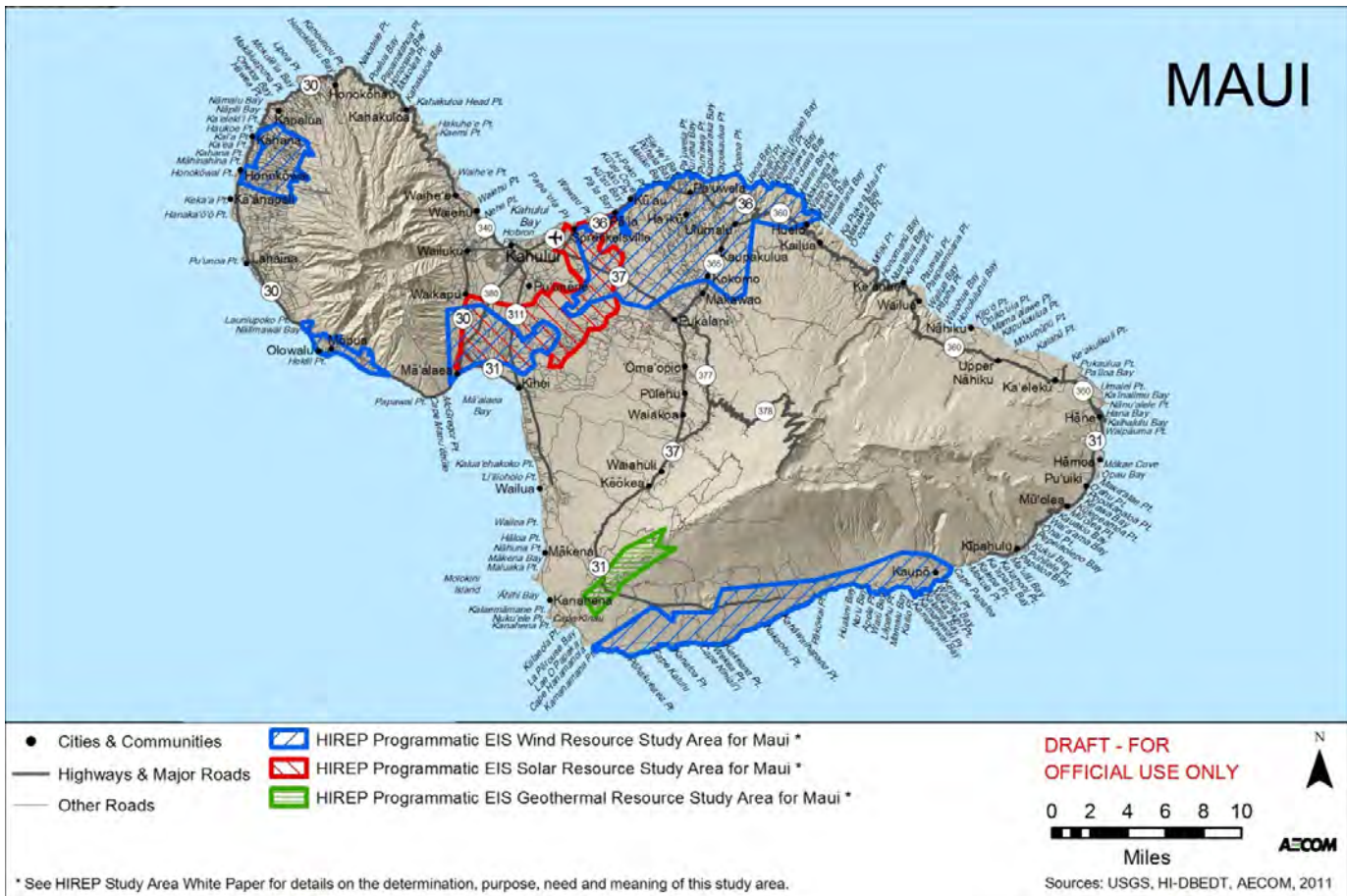


FIGURE 34

6. Cable Landing Sites Study Areas – SECTION TBD

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