Spatial Analysis Based Assessment of the Current & Future Needs of the Aging Population in Humboldt County

HSU Environmental Planning Senior Practicum

Final Report Presented May 15, 2014
To Stakeholders & Community Members,
Humboldt County Board of Supervisor's
Chambers, Eureka CA

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Acknowledgments:

We would like to thank Yvonne Everett for her guidance and support, Maren Rose and the Area 1 on Aging for this opportunity, and Brian Huggett for help and guidance with ArcGIS.

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Executive Summary:

Along with the rest of the country, Humboldt County, California's population is getting older. As the baby boomers age, their demographic will need to figure more prominently as a focus of community planning. Our purpose is to map where older adults live now and what services are available to them, and to assess which communities are likely to see a growing number of seniors and increased demand for housing and services in the future. This spatially informed analysis will assist planners and service providers to better adapt Humboldt County to these changing demographics and assist older adults living in Humboldt County to age in place with dignity.

To understand how Humboldt County could better adapt to changing demographics, we first took a pulse of Humboldt County's communities as they were in 2010. Using the 2010 Census we mapped where people aged 50 years and older live by communities as designated by the Census Bureau. This way, planners using our analysis could interpret the current distribution of seniors, defined as people over 60 years of age, as well as where concentrations of people live who are slightly younger today, but who will need to be served by 2020. Through the 2014-15 Senior Information Guide produced by the Area 1 Agency on Aging, and independent research, we located and mapped senior services such as food banks, residential care facilities and senior centers (see Appendix 3). This information can be used to identify which areas with higher concentrations of seniors are currently more or less well served and which ones will likely need more services in the future.

This analysis was carried out in the Environmental Management & Protection Senior Planning Practicum class 475 by two students from the Department of Environmental Science and Management at Humboldt State University. The project was produced for the Area 1 Agency on Aging whose primary purpose is to plan, coordinate services, and advocate for the needs of seniors in Humboldt & Del Norte Counties in Northern California.

Age-Friendly: An age-friendly community is accessible to and supportive of people of all ages.

Age-in-place: Aging in place refers to people growing old in their own homes or communities of their choosing, as opposed to aging in institutional living facilities.

Baby-Boomer: The baby-boomer generation is the large age-cohort born after WWII. It includes those born from 1946 to 1964.

Census Designated Place (CDP): A census designated place is a community which can be defined geographically and by name by locals, but has no legal delineation[1].

City: An incorporated city or municipality is an official government unit with a mayor, city council, and planning commission.

Community Service District (CSD): A community service district is a legally and spatially defined area within which specified public services such as sewer, water or fire are provided.

Geographic Information System (GIS): GIS is a computerized system for capturing, analyzing and mapping spatial information.

Senior: The Older American's Act[2] defines those 60 and over as seniors.

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[1] U.S. Census Bureau. Geographic Terms and Concepts – Place. Available from: http://www.census.gov/geo/reference/gtc/gtc_place.html

[2] Administration on Aging. *Unofficial Compilation of The Older American's Act.. As Amended In 2006 (Public Law 109-365).* Available from: http://www.aoa.gov/AOA_programs/OAA/oaa_full.asp

Introduction & Challenges:

America is getting older. The baby boomers are reaching retirement, and many of our communities are poorly prepared to serve their emerging needs. The baby boomers are the large generation of people born after World War II, and they are causing unprecedented growth in the number and proportion of people over the age of 60. Many of these older adults wish to age in place, remaining in the communities in which they spent their working years. However, they often find that there are few alternatives to traditional retirement homes. Thankfully, many communities have sensed this demographic shift, and are planning for more complete, age-friendly communities. Now it is time for the North Coast to follow suit.

Creating equitable environments for all ages depends upon three aspects of community planning: housing, access, and safety. The sprawling suburbs and single family homes many baby boomers grew up in no longer accommodate these seniors as they become less mobile and seek more appropriate housing within their own community. Affordable housing is an essential piece of the puzzle. In Humboldt County, 35.6% of seniors are "economically unstable" and 7.1% live below the federal poverty line[3]. Smaller lots, mixed use zoning, and housing options for those on fixed incomes, are needed.

The location of these housing options in relation to other important senior services, such as health care providers, is of equal importance to appropriate housing. Seniors should be able to access doctors, nutritional services and recreation opportunities by means other than a personal vehicle, as many older adults lose the ability to drive or maintain a car. If seniors are able to reach services by bus or on foot, they can operate independently for many more years. This is of special concern in Del Norte and Humboldt Counties (Area 1 Agency on Aging), because over half of the senior population lives outside incorporated areas[4]. While incorporated areas tend to host the majority of senior services, bringing additional services into these unincorporated rural areas is, in most cases, cost prohibitive, so solutions need to emphasize and integrate with the existing community networks, local values, and sense of place often found in rural communities[5]. Planning for changing demographics should retain the integrity and vision of the community and its context.

Senior safety in emergencies is a third key challenge. Hazard planning is of special concern on the North Coast. Our tectonically active coastal and forested environment presents a constant risk of earthquakes and tsunami and a seasonal risk of

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[3] Area 1 Agency on Aging (A1AA). Area Plan. pg. 14.

[4] Area 1 Agency on Aging (A1AA). Area Plan. pg. 16.

[5] Walsh, K. et al. (2014). Exploring the Impact of Informal Practices on Social Exclusion and Age-Friendliness for Older People in Rural Communities. Journal of Community & Applied Social Psychology, pg. 46

wildfire. With the population, and seniors in particular, living in broadly distributed remote locations, Humboldt County communities are especially vulnerable to natural hazards. Evacuation plans, shelters, special districts, and ambulance response times all need to be assessed for their ability to serve senior populations. In a hazard event, rural communities spread out across the extensive landscape may quickly be cut off in isolated islands that will need to serve their populations, including seniors, independently.

Seniors are an important and growing demographic. They are valued and often very active members of our communities. It is critical to plan our housing, services and hazard response infrastructure so that this growing number of seniors can choose to safely age in place.

Communities:

The communities represented in our analyses are either incorporated cities or census designated places (Figure 1). Cities are governmental units with their own plans, services, and employees. Census designated places are locally recognized unincorporated small towns and communities. These places often have some centralized infrastructure and identity, but do not have their own police force, and final planning authority is delegated to the Humboldt County Board of Supervisors. Cities in Humboldt tend to have more suburban and compact design, while unincorporated areas tend to be more rural. Rural communities may be underserved, as service provision in these areas may not meet necessary economies of scale and may therefore be cost prohibitive.

The Humboldt County General Plan Update has been in contention for many years; therefore, plans for many areas are uncertain. Final zoning designations and other planning parameters are currently outdated and under review in many areas, making it more difficult for other planning agencies, such as A1AA, to understand where housing developments and adaptation measures should be geographically focused

Figure 1- Places in Humboldt County and total population in 2010. Cities in bold.

Northern Humboldt:		Southern Humboldt:	
Arcata	17,231	Alderpoint	186
Blue Lake	1,253	Benbow	321
Big Lagoon	93	**Ferndale**	1,371
Eureka	27,191	**Fortuna**	11,926
Feildbrook	859	Garberville	913
Fields Landing	276	Hydesville	1237
McKinleyville	15,177	Miranda	520
Orick	357	Myers Flat	146
Trinidad	367	Phillipsville	140
Westhaven-Moonstone	1,205	Redcrest	89
Willow Creek	1,710	Redway	1,225
		Rio Dell	3,368
		Scotia	850
		Shelter Cove	693
		Weott	288

Age Distribution in Humboldt County Communities:

The following graphs represent 10 year age cohorts by community. The x-axis represents each individual place, and they y-axis is the number of persons. Due to the large variation in population cohorts, the graphs are set to independent scales. The purpose of these graphs is to compare populations of a certain age group between communities, but not compare different age groups within one community. Data are to be interpreted within a graph, not between.

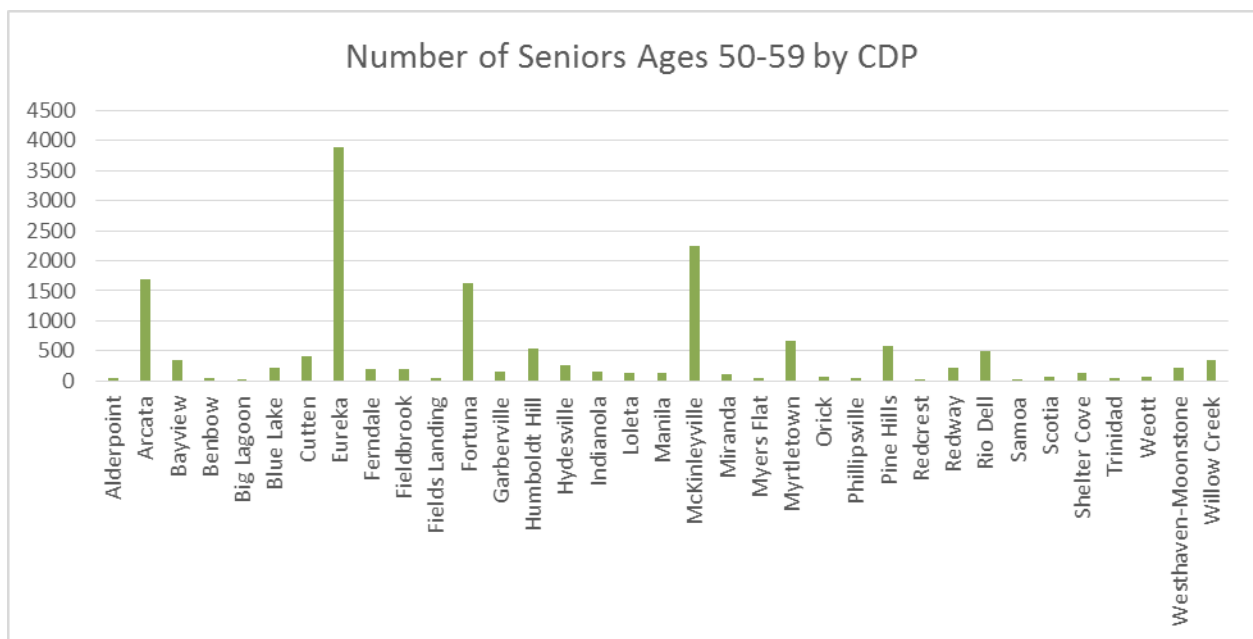Figure 2.1: Seniors Age 50 to 59 years old in each CDP by number of people

Figure 2.2: Seniors Age 60 to 69 years old in each CDP by number of people

Number of Seniors Ages 60-69 by CDP
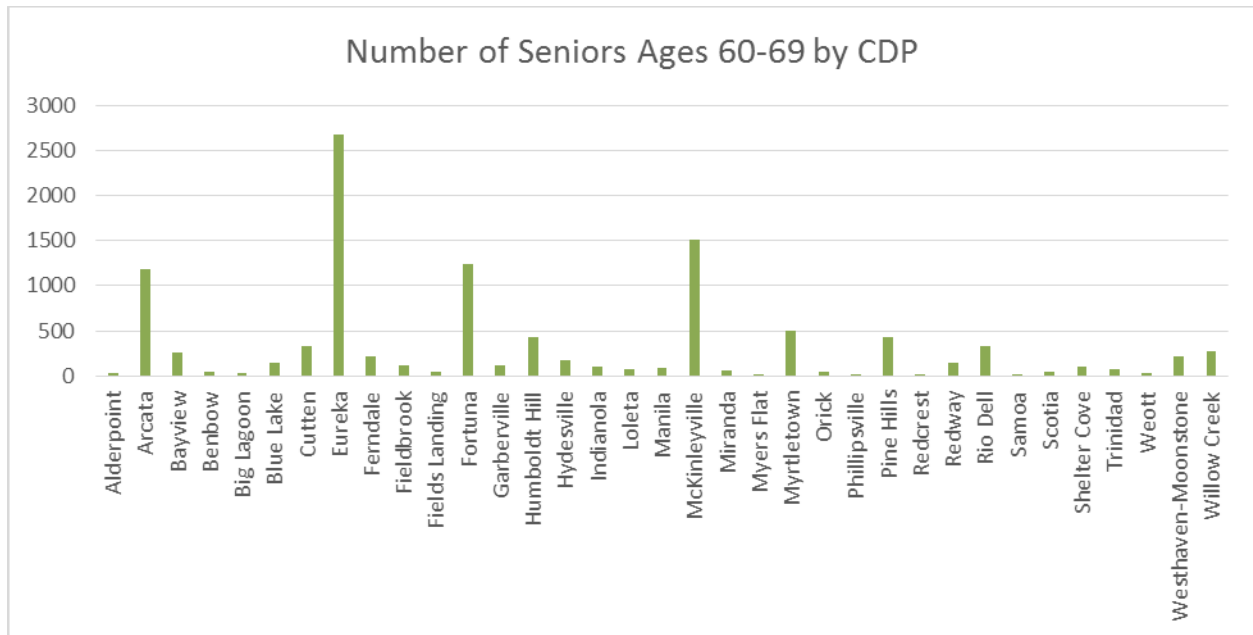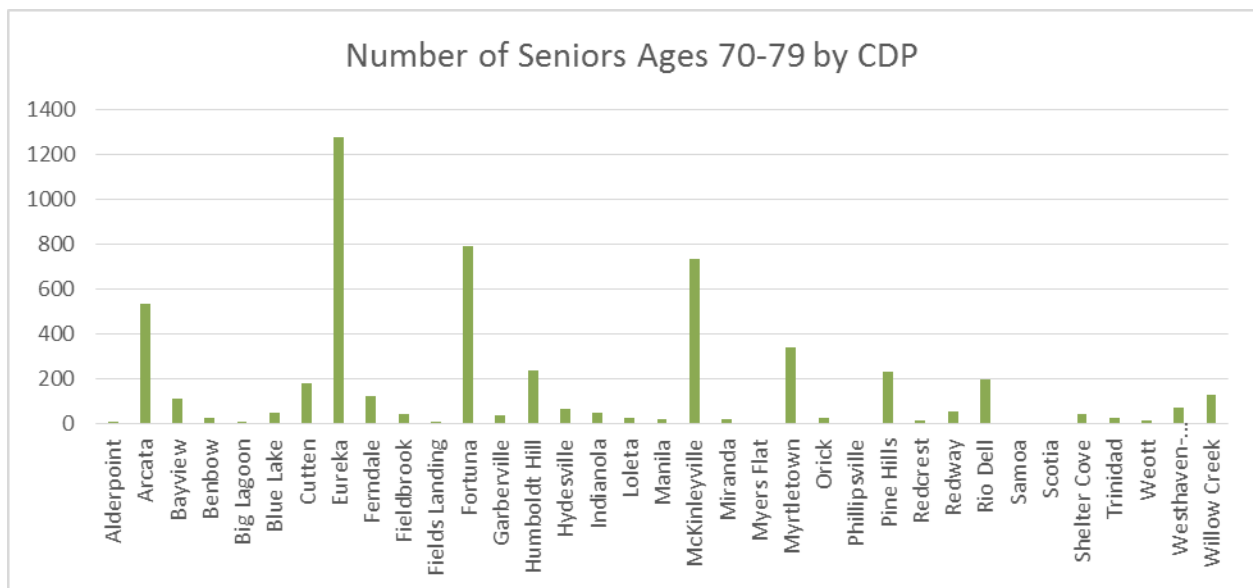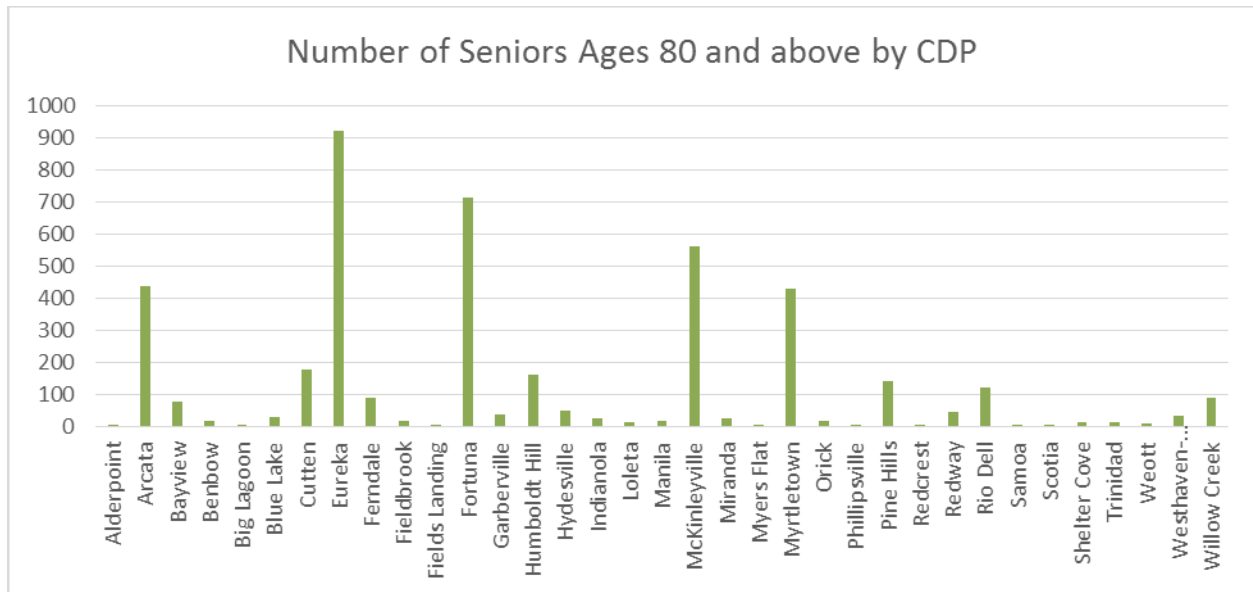
Figure 2.3: Seniors Age 70 to 79 years old in each CDP by number of people

Number of Seniors Ages 70-79 by CDP

Figure 2.4: Seniors Age 80 years old and up in each CDP by number of people

Number of Seniors Ages 80 and above by CDP

Methods:

The main approaches we used in developing this report were discussions with the Area 1 Agency on Aging, literature review and geographic information systems (GIS) based analysis. GIS is used to represent or map any kind of geographically referenced data. GIS specialists use computer hardware and software to capture, manage, analyze and display spatial data. It allows users to overlay different types of data on the earth's surface and to view, question, interpret, and visualize data in many different ways that reveal relationships, patterns, and trends. GIS is an important planning tool that can be used to analyze and interpret the needs of a community[6]. This spatial analysis focused on the demographic shift in Humboldt County using ArcMap GIS software. Available data included roads, hazards, and other data files from Humboldt County Web GIS.

In addition, we acquired population data from the 2010 Census[7]. The U.S. Census Bureau changed methodology for the collection of population data in 2010. Previously population data were organized by zip codes. In the 2010 Census population data are organized by Census Designated Places (CDP). This limited the way the data could be interpreted, causing us to represent Population by CDP instead of through more traditional legal delineations. We chose to represent population data sets in five year increments ranging in age from 50 to 85 and over. This stratification provides information about the broad spectrum of the aging population, including baby boomers. Even though normal retirement age is considered 65[8], we chose to represent citizens 50 and over so that baby boomers could be included, because if communities can anticipate changing demographics, they can adapt proactively. Senior age classes were represented as number of individuals and as a percent of total population.

The number of adults in a cohort for a given place will help planners to identify population pockets in need of services and or planning. Representation of seniors as a percent of total population illustrates communities that are experiencing an over-representation of older adults that may have a greater need for services and caretakers. While places with greater numbers of seniors represented may need to address these issues more quickly, if these communities are small or geographically isolated, they may also fail to meet economies of scale to be served by traditional services, especially those located outside of the incorporated areas.

Maps representing population were divided into two regions: Northern Humboldt and Southern Humboldt. While there are many social and political delineations which describe these two regions, we decided to represent the Eureka and

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[6] ESRI. What is GIS?. Available from: http://www.esri.com/what-is-gis/overview
[7] Population data was acquired from the U.S. Census Bureau's American Fact Finder Web Interface. Aquired on 30 January, 2014.Avialble from: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
[8] United States Social Security. Available from: http://www.ssa.gov/pubs/ageincrease.htm

Humboldt Bay communities and north as Northern Humboldt, and the area from Lolita-Ferndale-Fortuna and south as Southern Humboldt. The geographic line was chosen for this analysis to fit the printed format of this document on 8.5 by 11 inch paper. Population is represented by the number of people in an age group or by the proportion of the population falling into an age group within a Census Designated Place (CDP). CDPs can be an incorporated city, or a community as defined by local people. Services are mapped within the CDPs in which they occur.

Clusters of services within walkable distance of each other, even if they are disconnected from residential areas are important. Such clusters can reduce the number of vehicle trips required by shuttle, taxi, or personal vehicle and the amount of time and money spent by care takers and or older adults while running errands. Walkable areas also increase the autonomy and sense of belonging to a community felt by older adults[9].

We mapped important places such as civic centers, food banks, senior centers, and residential care facilities as point locations on top of the shaded senior population distributions to show their relative accessibility. Our services data were supplied by A1AA from their Senior Information Guild 2014-2015. The services' addresses were then converted to latitude and longitude using Latlong.com.

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[9] Buffel, T. & Phillipson, C. (2012). Aging in urban environments: Developing 'age-friendly' cities. Critical Social Policy, pg. 600

Spatial Analysis of Population and Services

The following maps represent the demographic distributions by ten-year age cohorts of older adults. We first present figures 3.1 and 3.2: Census Designated Places Northern & Southern Humboldt County as reference to interpret and locate communities on figures 4.1-4.8. The amount of seniors by community are separated into four age cohorts 50-59, 60-69, 70-79, and 80 plus. Figures 4.1 -4.8 represent the number of people in each community to illustrate where there are large concentrations of people with similar care needs. Maps representing five-year age cohorts by number and percent of population can be found in Appendix 2.

Census Designated Places
Northern Humboldt County
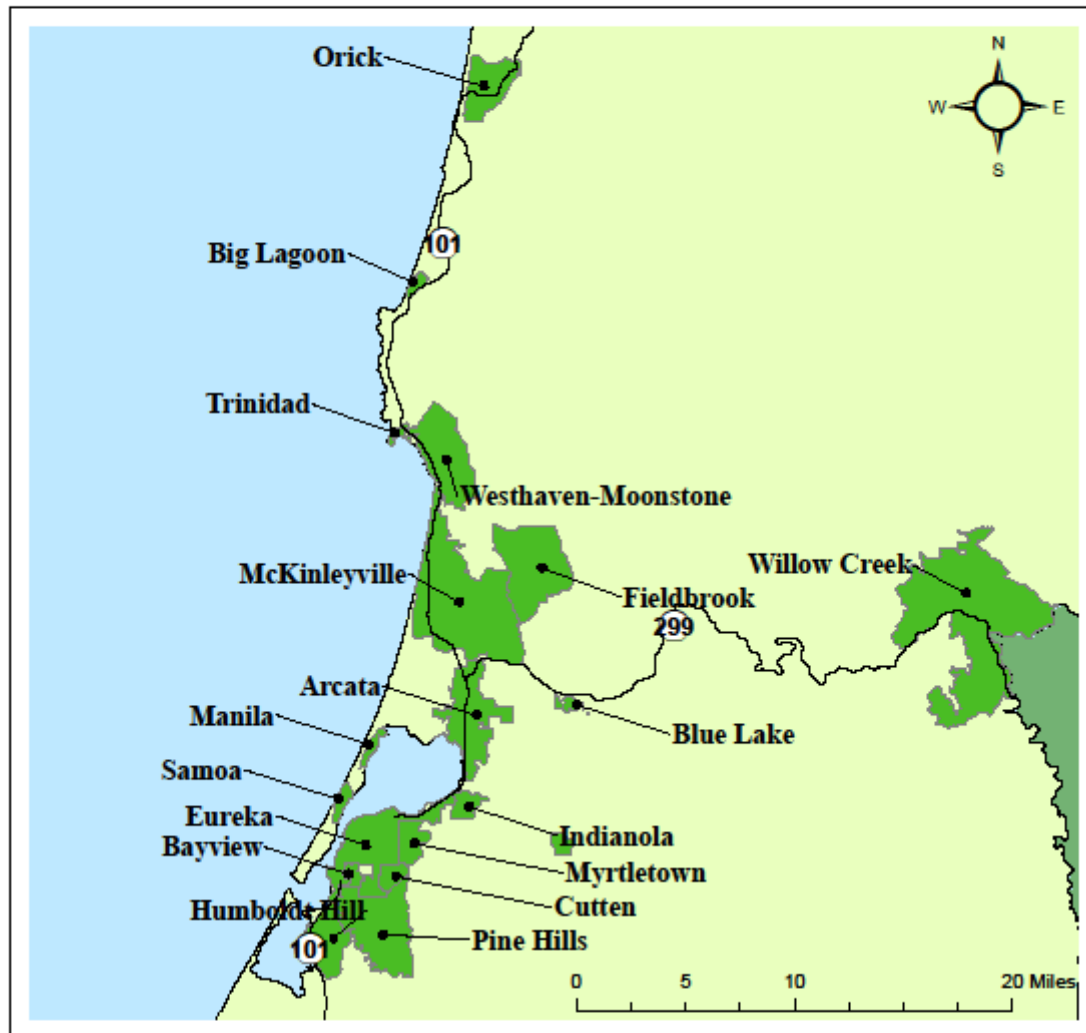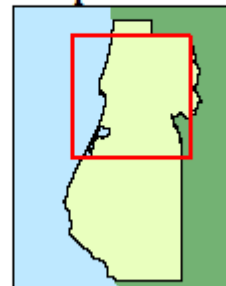
Figure 3.1

Census Designated Places
Southern Humboldt County

Map Information
Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/12/2014

Figure 3.2
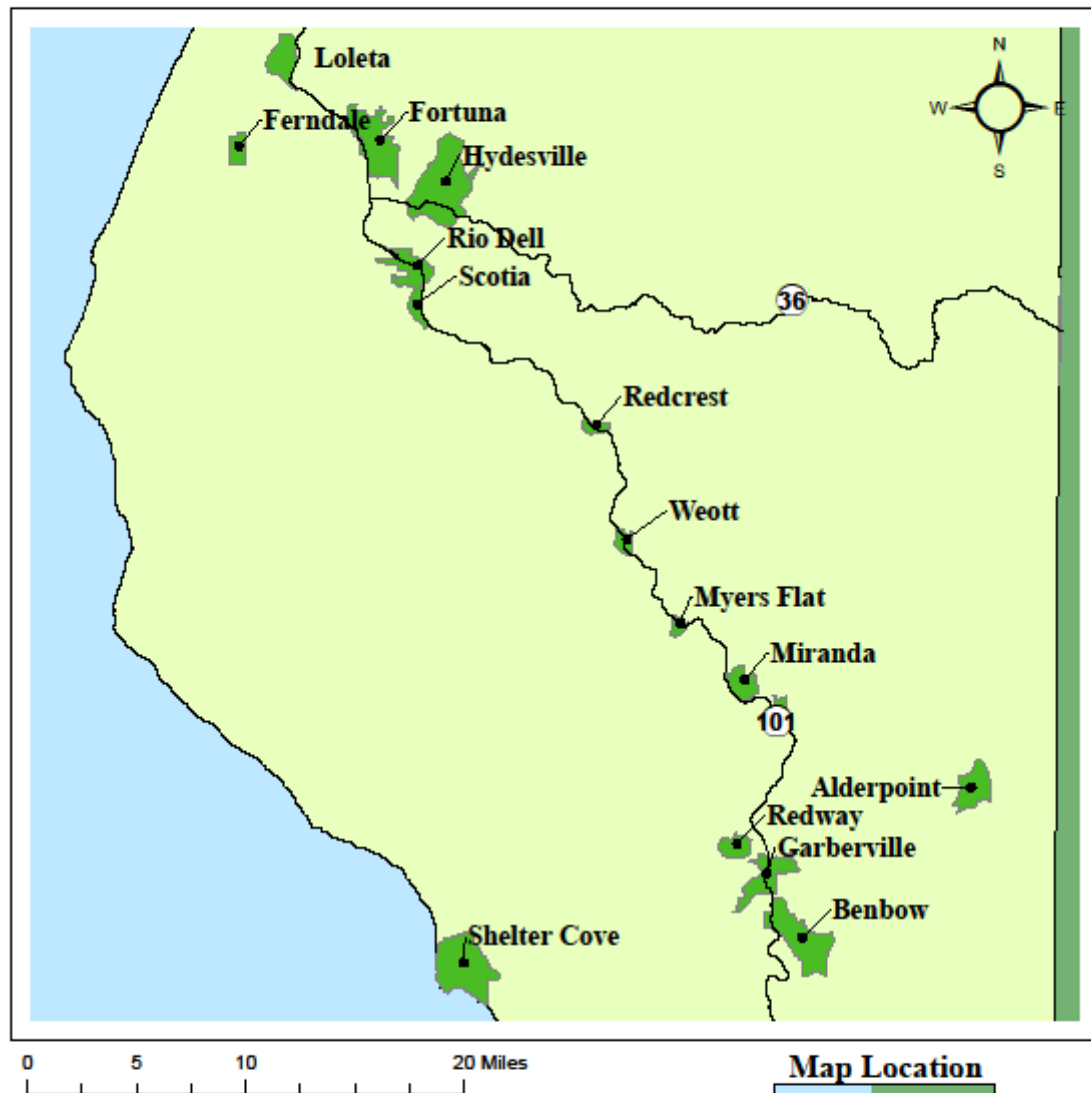
Aging in Humboldt County: People Aged 50-59 Years

The density of persons in their 50s was mapped to illustrate the differences in the spatial distribution of people who are generally still working, and those who have started to retire (Figure 4.1 and4.2).

The 50-59 age class is settled mostly in the tri-city area of Arcata, McKinleyville, and Eureka. Many of these people are still in their working years, and may choose to leave the area once they reach retirement. If they choose to age-in-place and stay in their homes and/or community, they will be well served by a myriad of services in the area. Outside of the tri-city area, this age class is settled primarily in Fortuna and surrounding communities near the mouth of the Eel River. Like the incorporated cities of the Humboldt Bay region, if these populations choose to age in place, they will be well served.
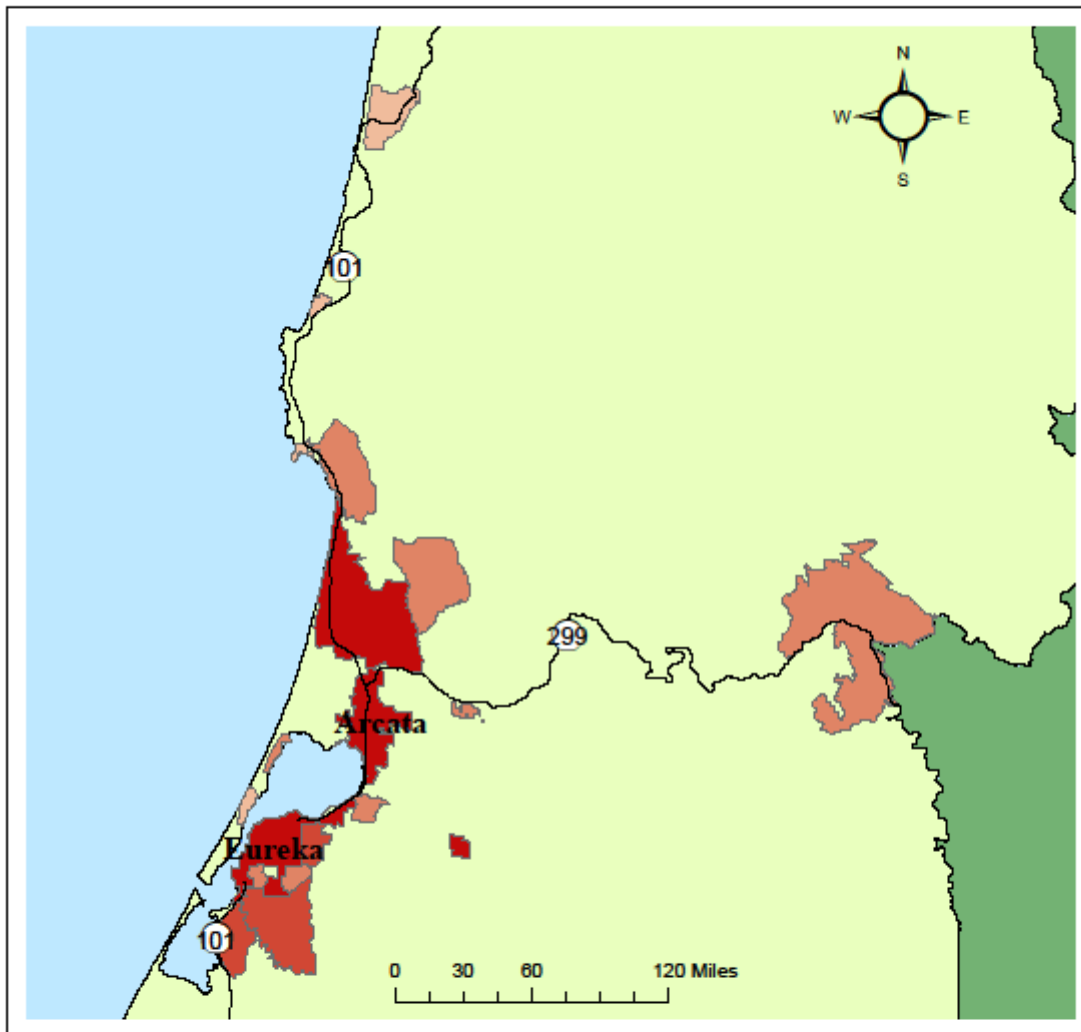
Redway is the only larger population pocket outside of the Humboldt Bay / mouth of Eel River region. With 222 people between the ages of 50-59 (18% of the total population) this is a sizeable group. Redway does not have a hospital, but does have other community services[10]. If transportation services, formal or informal, can help less mobile older adults travel from their private homes to community centers, Redway should be able to adapt well to its aging community, and serve as a hub for older adults in Southern Humboldt.

As a percent of population, outside of city centers in Northern Humboldt, this age class is most apparent in Orick and Fieldbrook (22% and 23% of total population). Orick lacks many services, and is not in close proximity to another community with appropriate services. With a total population of 357 people, Orick's population is not likely to meet a necessary economy of scale to initiate services. People who chose to age in place here will need to depend on family and community members.

In Southern Humboldt, many of the CPDs that line the 101 corridor between the Ferndale – Fortuna and Garberville areas have age classes of 50-59 making up almost a quarter or more of the population. Alderpoint (24%), Phillipsville (29%), Myers Flat (29%), and Weott (24%) all have small populations under 300 people total, and are small pockets far away from services. It is unlikely that these geographic islands will add services, and people who chose to stay in area will need to be supported by their community.

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[10] See "Services Located in Garberville, Benbow, and Redway CDPs" Appendix 3 pg. lxxiii.

Number of Seniors ages 50 to 59 in Northern Humboldt County, CA

Map Information
Coordinate System: NAD 1983 UTM
Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS
and US Census Bureau
Made For: Area 1 Agency on Aging,
EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Legend

Age 50 to 59 by number of population

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.1

Number of Seniors ages 50 to 59 in Southern Humboldt County, CA

Map Information
Coordinate System: NAD 1983 UTM
Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS
and US Census Bureau
Made For: Area 1 Agency on Aging,
EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Legend

Age 50 to 59 by number of population

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.2

Aging in Humboldt County: 60-69

The 60-69 age class represents the shift into retirement. This age class is well settled in the tri-city area and surrounding communities. As a proportion of population, people over 65 are concentrated on the periphery of Humboldt Bay communities[11]. The largest numbers of persons 60-69 outside incorporated cities live in Myrtletown, Pine Hills, Humboldt Hill, and Cutten – all communities on the periphery of Eureka. Since Eureka is the main urban center of Humboldt County, these areas will support people aging-in-place if they can be regularly transported into Eureka for groceries, doctors' appointments, and social events.

As a percent of population Big Lagoon (29%) and Trinidad (20%) are home to the most persons in their 60s. Seniors in Trinidad, and Fieldbrook should be able to be served by McKinleyville and Arcata, while Big Lagoon may be too far away from population centers for everyday services. Big Lagoon has a total population of 96 people – 27 of whom are in their 60s – so is unlikely to meet an economy of scale. There are two populations in Big Lagoon, indigenous people who are members of the Big Lagoon Rancheria and non-indigenous peoples. Those who are members of the Rancheria can access services through United Indian Health Services[12], and may find it easier to remain in place.

Phillipsville, Willow Creek, and Shelter Cove also all support elevated densities of persons between the ages of 60-69 but do not support an unprecedented number of seniors for the region. These are vastly different communities; where Shelter Cove is a remote, amenity retirement community, Philipsville is home to more people on fixed incomes, but all lack services. Due to their isolation, members of these communities will need to depend on services within the community for daily needs.

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[11] See "Seniors ages 65-69 in Northern Humboldt County, CA by percent population" Appendix 2
[12] Not mapped

Number of Seniors ages 60 to 69 in Northern Humboldt County, CA
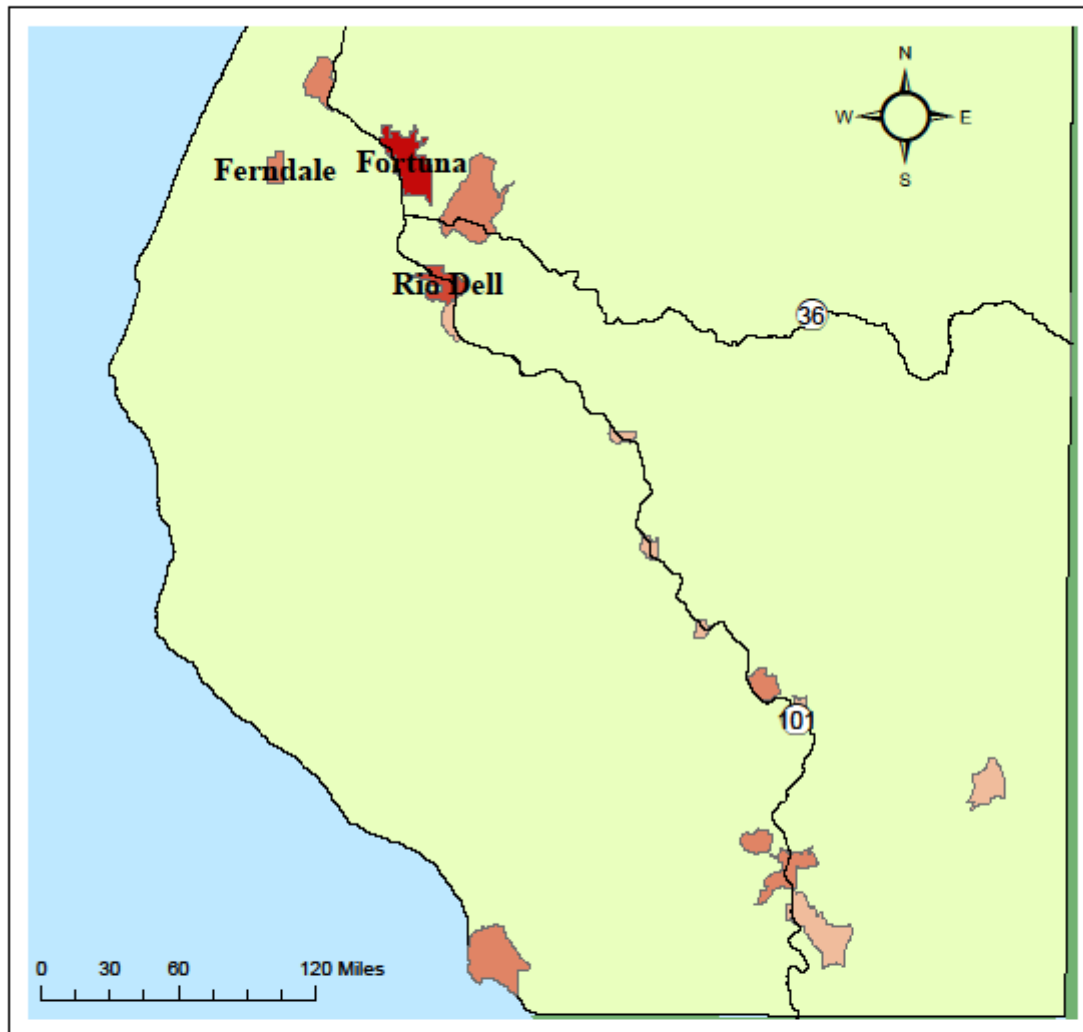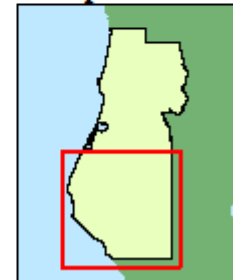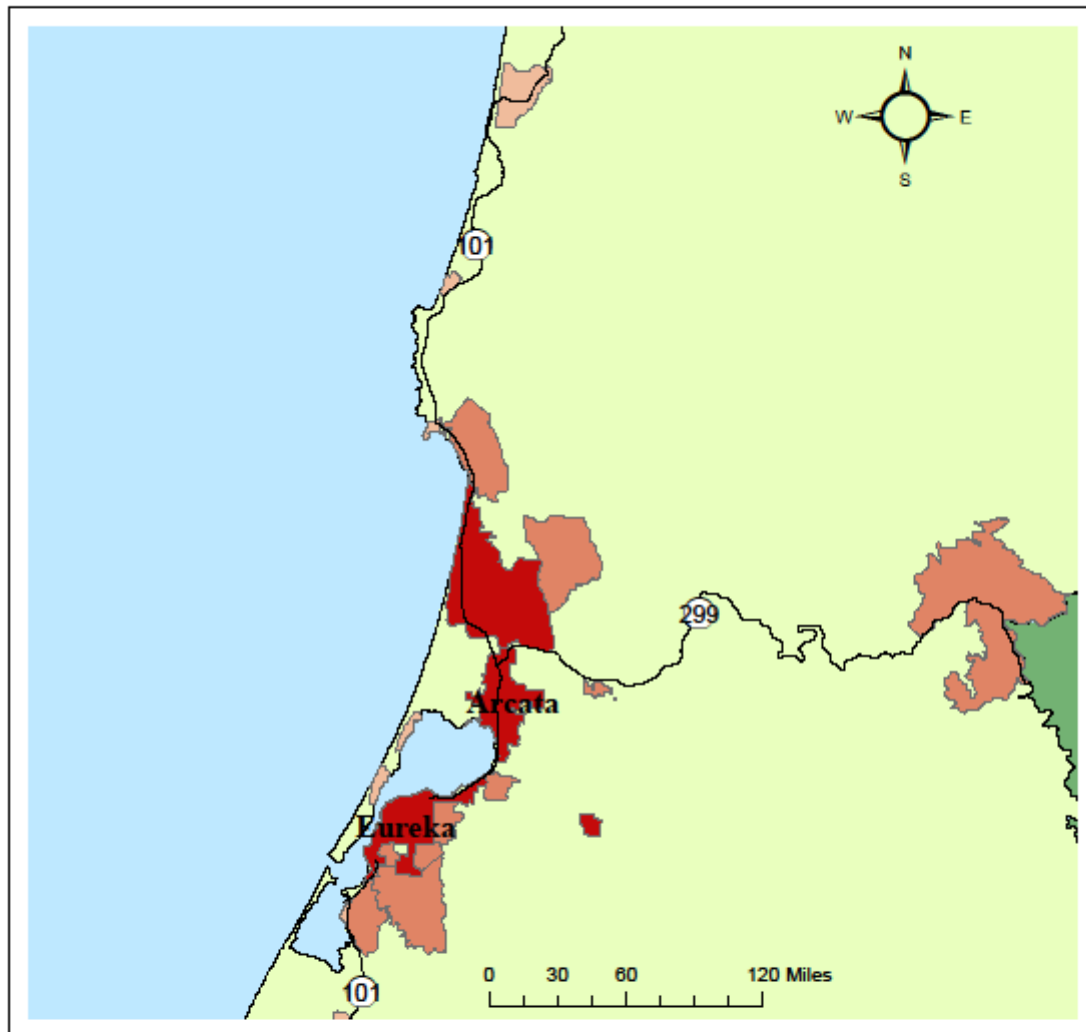

Map Information
Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from: Humboldt County Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Legend

Age 60 to 69 by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.3

Number of Seniors ages 60 to 69 in Southern Humboldt County, CA
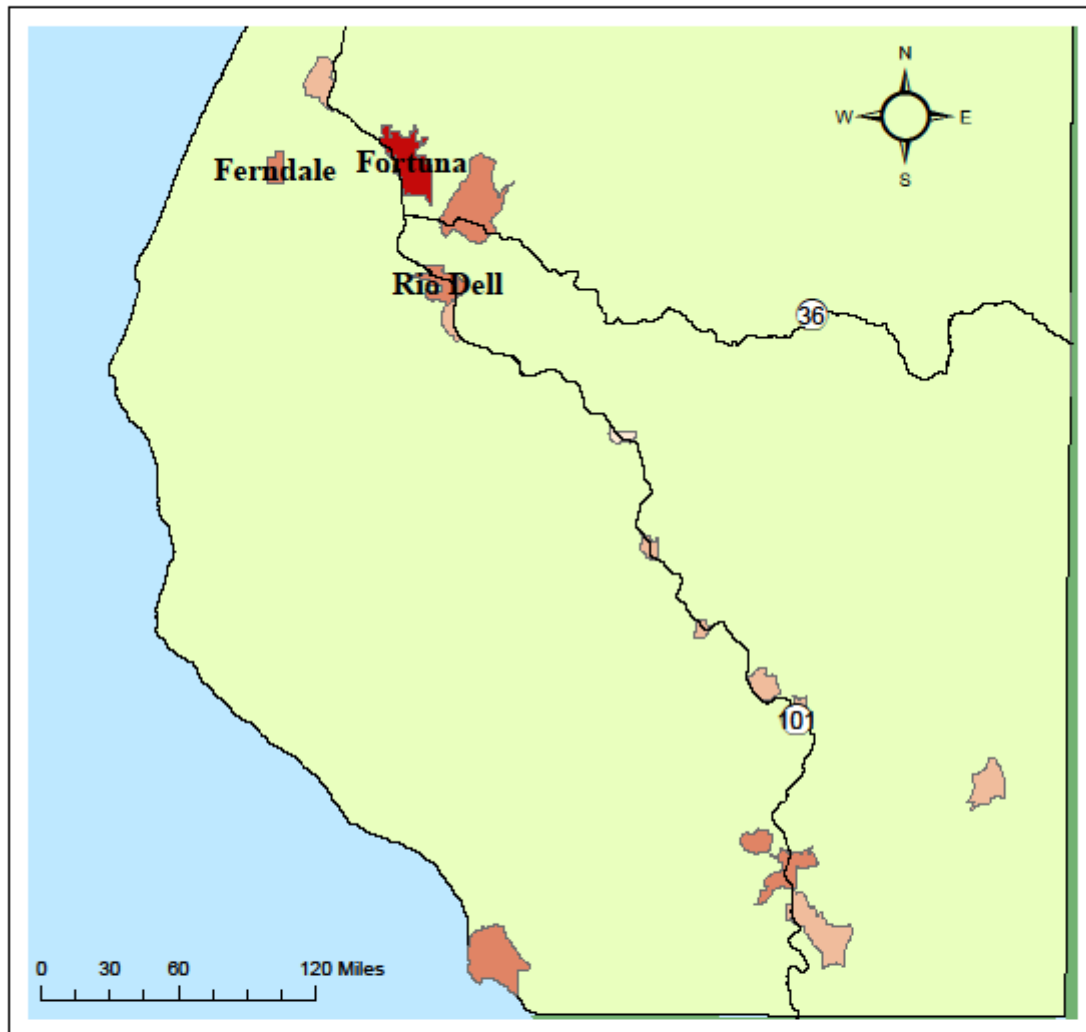
Map Information
Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from: Humboldt County Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Legend

Age 60 to 69 by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.4

Aging in Humboldt County: People Aged 70-79 Years

Persons in their 70s are settled mostly in Eureka, Fortuna, and McKinleyville. Each city has over 700 people between the ages of 70-79, with Eureka supporting over 1,200 persons in this age-class. Much like the 60-69 age class, communities surrounding Eureka also support elevated numbers of people in their 70s. This age class may need more specialized services, especially for transportation, as older people are less likely to drive. These areas should be relatively easy to adapt to a growing demographic of older adults. Dial-a-ride is available in the Humboldt Bay region as well as in Fortuna, which should be able to accommodate this need.

Outside of the population centers of incorporated cities, Redcrest, Big Lagoon, and Benbow support the highest proportion of people in their 70s. Redcrest and Benbow residents can have their daily needs meet by Garberville and Redway. Residents of Big Lagoon, which also supports an elevated population of people in their 60s, will need to be transported into McKinleyville or Arcata for major health needs, either by buses, shuttles, or community members. Shuttles for outlying areas already exist for some services and some segments of the population such as those serving Humboldt County clients of United Indian Health Services in Arcata.

Number of Seniors ages 70 to 79 in Northern Humboldt County, CA

Map Information
Coordinate System: NAD 1983 UTM
Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS
and US Census Bureau
Made For: Area 1 Agency on Aging,
EMP Senior Practicum Project, HSU
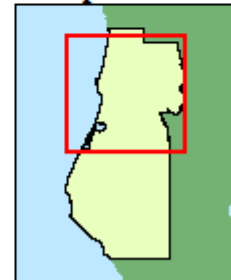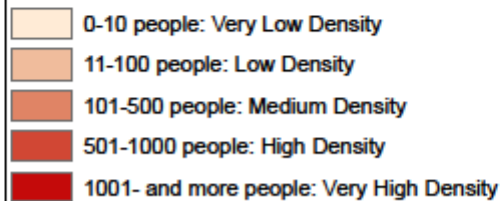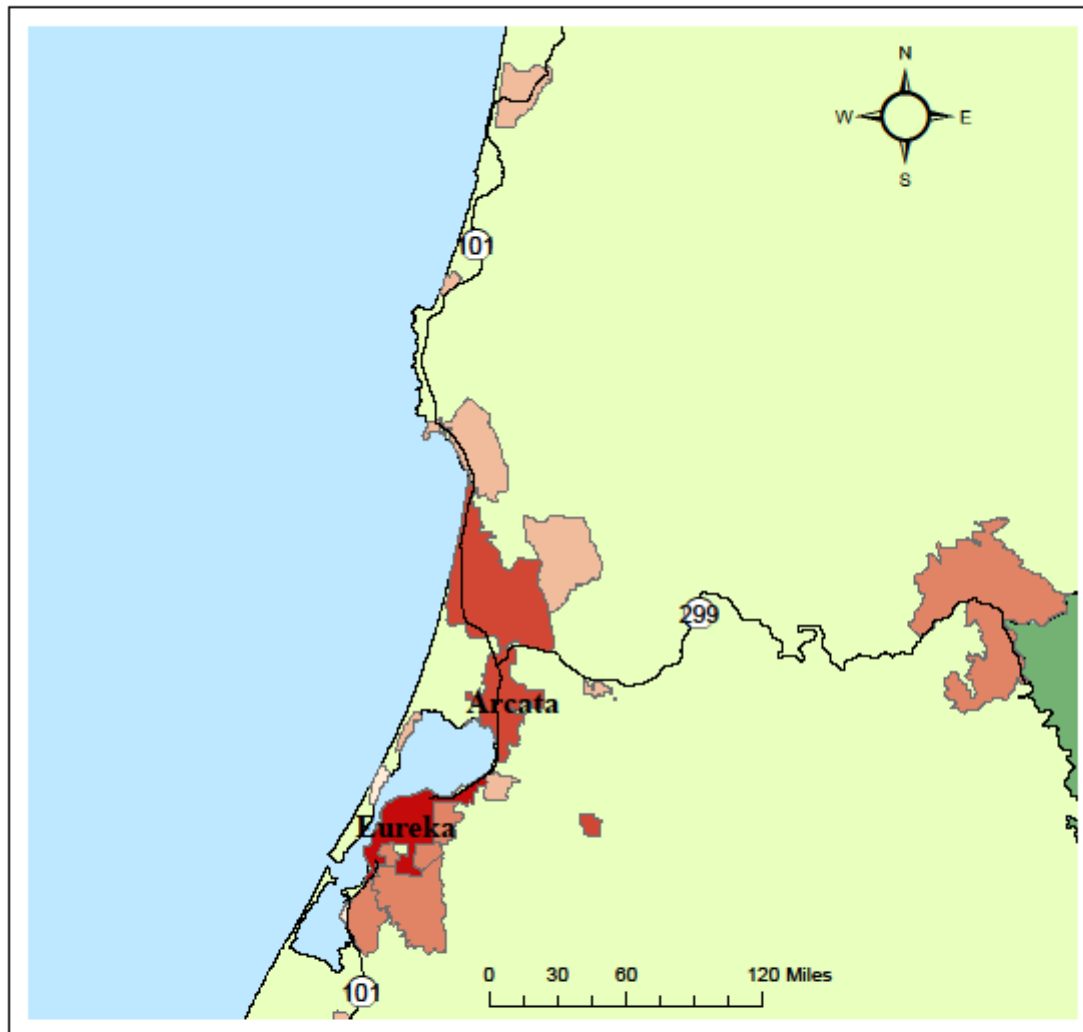Made By: Hannah Spittler
Date produced: 4/17/2014

Legend

Age 70 to 79 by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.5

Number of Seniors ages 70 to 79 in Southern Humboldt County, CA

Map Information
Coordinate System: NAD 1983 UTM
Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS
and US Census Bureau
Made For: Area 1 Agency on Aging,
EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
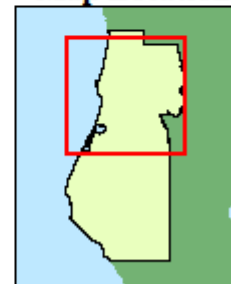Date produced: 4/17/2014

Legend

Age 70 to 79 by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Figure 4.6

Aging in Humboldt County: People Age 80 Years & Older

People over the age of 80 make up a smaller proportion of the senior population. About half of this group live within the Eureka-Fortuna incorporated areas, while a large number live in the unincorporated McKinleyville-north area. For those living in the incorporated area, a myriad of services are available for seniors, including the location of most of the institutional living facilities and hospitals. There is an overrepresentation of this demographic is Myrtletown, which is attributed to the formal senior living facilities in the area. Those seniors living outside the incorporated areas have less services available and increased challenges in accessing services. Trends such as the designation of this area for housing development by Humboldt County show that this will be an area of future growth.

Number of Seniors ages 80 & up in Northern Humboldt County, CA

Legend

Age 80 & up by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
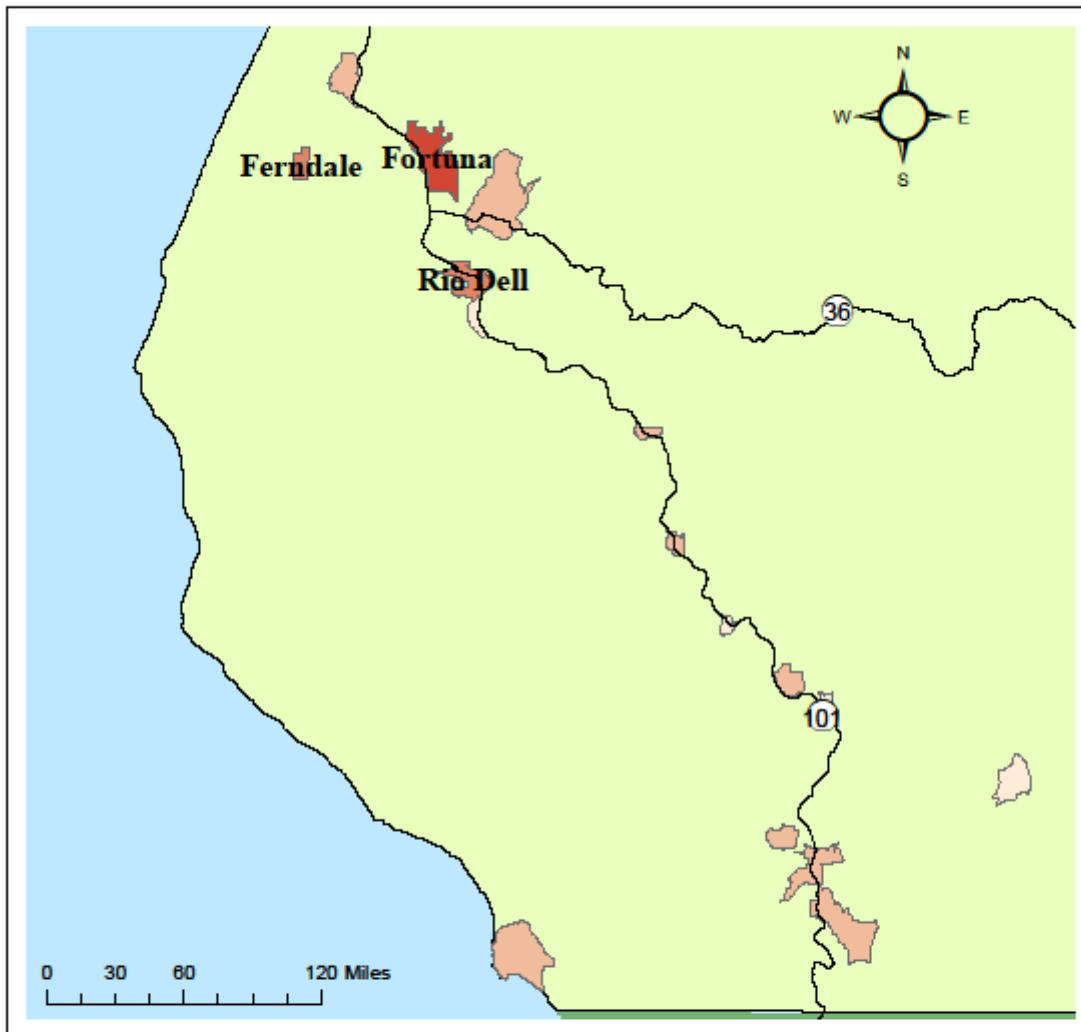- 501-1000 people: High Density
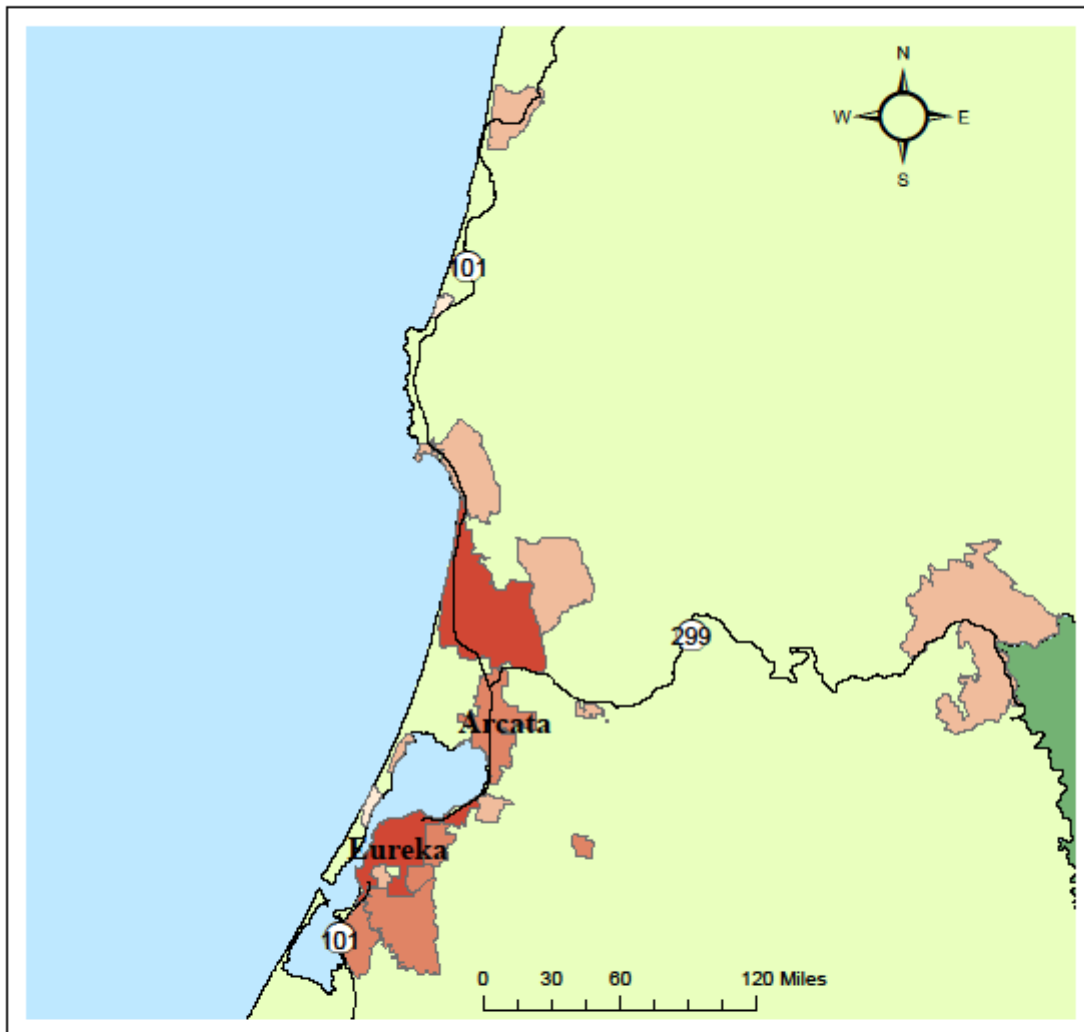- 1001- and more people: Very High Density

Map Information
Coordinate System: NAD 1983 UTM
Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS
and US Census Bureau
Made For: Area 1 Agency on Aging,
EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Map Location

Figure 4.7

Number of Seniors ages 80 & up in Southern Humboldt County, CA
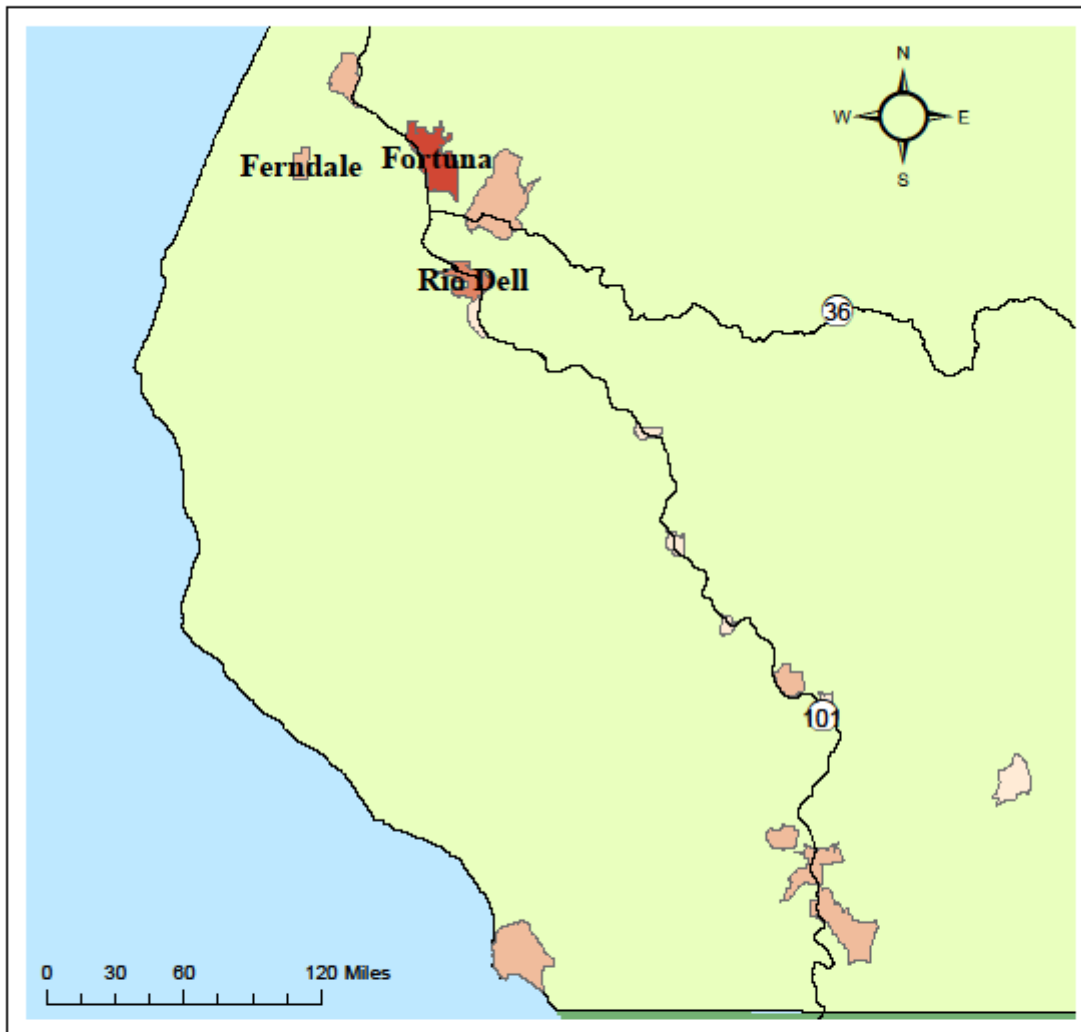
Legend

Age 80 & up by number of people

- 0-10 people: Very Low Density
- 11-100 people: Low Density
- 101-500 people: Medium Density
- 501-1000 people: High Density
- 1001- and more people: Very High Density

Map Location

Map Information
Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from:
Humboldt County Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
Made By: Hannah Spittler
Date produced: 4/17/2014

Figure 4.8

Housing Assessment:

Senior housing will have to be created though repurposing existing infrastructure and constructing new developments to serve the diverse needs of the baby boomer population[13]. In many places, where seniors wish to age in their own homes, the aging housing stock will need to be modified to accommodate the changing physical abilities associated with aging. Repurposed suburbs across the country have created "virtual retirement communities" which allow seniors to stay in their own homes, provide access to support services such as nursing, and have pioneered "a community-based alternative to nursing homes for the frail elderly"[14]. These communities can be created by local governments or non-governmental organizations (NGOs). In some places strict zoning ordinances can be changed to allow unrelated adults to share a single family residence[15] or add additional 'mother in law units' so that many older-adults can live together and share costs, or support an exchange of care giving services for rent. If these places can accommodate multiple adults, cities can avoid the cost of expanding infrastructure to new developments, and rents can match the fixed income of many retirees, making these choices more fiscally responsible for local governments, and more equitable for seniors[16].

Local government planning and zoning are tools that implement and shape the long term vision of a community and define its character. Zoning designates permitted and density of uses i.e. rural residential. Age-friendly zoning is identified in the literature as dense, multi-family housing and mixed use[17]. Decision makers in local government need to consider access to physical, social, cultural and economic factors. Appropriate housing, with a diversity of care level options, does not on its own constitute age-friendly living. For seniors to age independently and with dignity, appropriate housing means appropriate social context. Many Section 202 developments, which provide affordable housing to seniors, have been built without public space and services, and now need to be retrofitted to provide access to health care and other

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[13] Kennedy, C. (2010). The City of 2050 - An Age-Friendly, Vibrant, Intergenerational Community. *Generations,* 34(3), 70-75.

[14] City of San Mateo. (2009). *Aging Well San Mateo*. San Mateo, California. Pg. 14

[15] In 1974 the Supreme Court ruled in Village of Belle Terre v. Boraas that local goverments could limit the number of unrelated adults sharing a single family home. These ordnances do not exist in all residential zoning.

[16] Kelly, R. (2014). *Ageism and Ableism in Community Design: How to plan for changing and equitable societies*. Unpublished. Pg. 5

[17] Residential and commercial on the same site. Usually commercial on the ground floor, and residential on upper floors.

services.[18] Aging with dignity requires access to important services and social inclusion, which can manifest through accessible and user friendly urban design[19].

The role of planners in encouraging senior friendly housing lies more in creating inclusive community and public spaces than in building the housing units themselves. Local government officials can encourage age-friendly communities by zoning for pocket neighborhoods in which people can function without a car. If seniors can downsize into complexes where they can function totally or mostly independently – it will increase the dignity in which they live and decrease the cost of caregiving services.

In more diffuse communities, hard infrastructure such as special transit services, free lunch sites, or recreation facilities designated for seniors may be cost prohibitive. Social connectivity in rural places will need to help overcome the lack of traditional civic installations. "What is necessary for rural areas is a more nuanced reconstruction of age-friendliness and its meanings in such settings"[20]. Rural places with low-density residential zoning may consider home modifications and shuttle services towards community centers which "promote social engagement and building relationships between community members"[21].

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[18] Heumann, L. et al. (2001). The 1999 National Housing Survey of Section 202 Elderly Housing (#2001-02). Washington, DC: AARP.

[19] Kelly, R. (2014). *Ageism and Ableism in Community Design: How to plan for changing and equitable societies*. Unpublished. Pg. 6

[20] Walsh, K. et al. (2014). Exploring the Impact of Informal Practices on Social Exclusion and Age-Friendliness for Older People in Rural Communities. *Journal of Community & Applied Social Psychology*. Pg 47

[21] Kelly, R. (2014). *Ageism and Ableism in Community Design: How to plan for changing and equitable societies*. Unpublished. Pg. 11

Hazards:

Humboldt County is subject to a range of natural hazards including earthquakes and tsunamis, flooding and wildfire. In a major hazard event, the whole region and certainly many of the county's widely dispersed rural population pockets may be isolated for days, even weeks at a time (Humboldt County 2013)[22]

Such events may disproportionately affect senior citizens. Seniors are particularly vulnerable as citizens who may be physically less mobile, and economically less flexible than others. Four important hazards to be prepared for are earthquake/tsunami, fire, and flood. Earthquakes are unpredictable, and therefore do not lend themselves well to predictive mapping, however for those living along the coast, tsunami hazard areas have been defined. A tsunami is a large ocean wave caused by an off-shore ocean wave, which can forcefully inundate low-lying areas. If there is a tsunami warning in effect, all residents in evacuation areas are instructed to move to higher ground.

To analyze different hazards in the County we chose to illustrate two case studies that can be spatially understood, fire and flood risk. . We used Willow Creek, as our fire model, and the Myers Flat, Miranda, and Philipsville area as our flood model. We did not produce new tsunami maps, because the best available data were not available in manipulative form, but in map outputs produced by the Redwood Coast Tsunami Working Group. We have included, and will discuss bellow, the King Salmon & Fields Landing Evacuation Map. A collection of evacuation maps for all communities in Humboldt County can be found on their website[23].

In Willow Creek there is a discontinuity between the community boundaries, and fire protection. Areas in the south boarder forest lands with high fire severity but lack complete protection coverage from a local fire district Therefore, people in this area face a higher risk of loss of life and property. Unlike other places, the community is not fully encompassed in a fire district, and faces unequal risk from flames encroaching from the adjacent hinterlands.

Much of Myers Flat and Philipsville are classified as "flood hazard" areas. These areas are designated by FEMA, and represent both 100 and 500-year floods. A 100-year flood has a 1% probably of occurring any given year, and a 500 year flood has a .2% probability in any given year. These probabilities are calculated off the previous flood record, but the true probability is likely to be effected by land use and climate change.

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[22] Humboldt County Department of Public Works 2014. Humboldt Operational Area Hazard Mitigation Plan 2013 Update Accessed May 2, 2014: https://co.humboldt.ca.us/natural-resources/hazardmitigation/docs/2014-3-19_update/a-humboldthmpupdate_vol1_2014-02_toc.pdf

[23] http://www.humboldt.edu/rctwg/

The King Salmon & Fields Landing area is home to a population of seniors on a fixed income. The topography of the area and physical ability of these seniors do not lend themselves well to an on-foot evacuation. If the epicenter of a tsunami is just off our coastline, there may not be much time between the warning sirens and the wave reaching the shore. This is especially dangerous if the population in a vulnerable area does not have access to or the ability to drive a car. In communities with increased vulnerability, personal or family plans will not be sufficient. Community plans, where neighbors check in on and aid each other, will need to be implemented if older adults, especially those living alone, are unlikely to be able to care for themselves in the event of an emergency.

Fire Districts Willow Creek

Hoopa VFC Response Area

Willow Creek Fire Response Area

Willow Creek VFD Response Area

Willow Creek

Willow Creek VFD

Willow Creek Fire Response Area

Willow Creek Fire Response Area

Willow Creek Fire Response Area

Willow Creek Fire Response Area

Map Location

0   1.25   2.5   5 Miles

Legend

N
W — E
S

Fire Districts

Census Designated Places

Map Information: Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from: Humboldt County
Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
Made By: Hannah Spittler Date produced: 5/1/2014

Figure 5.1

Flooding Hazards

Map Information: Coordinate System: NAD 1983 UTM Zone 10N
Layers and Data Collected from: Humboldt County
Planning Web GIS and US Census Bureau
Made For: Area 1 Agency on Aging, EMP Senior Practicum Project, HSU
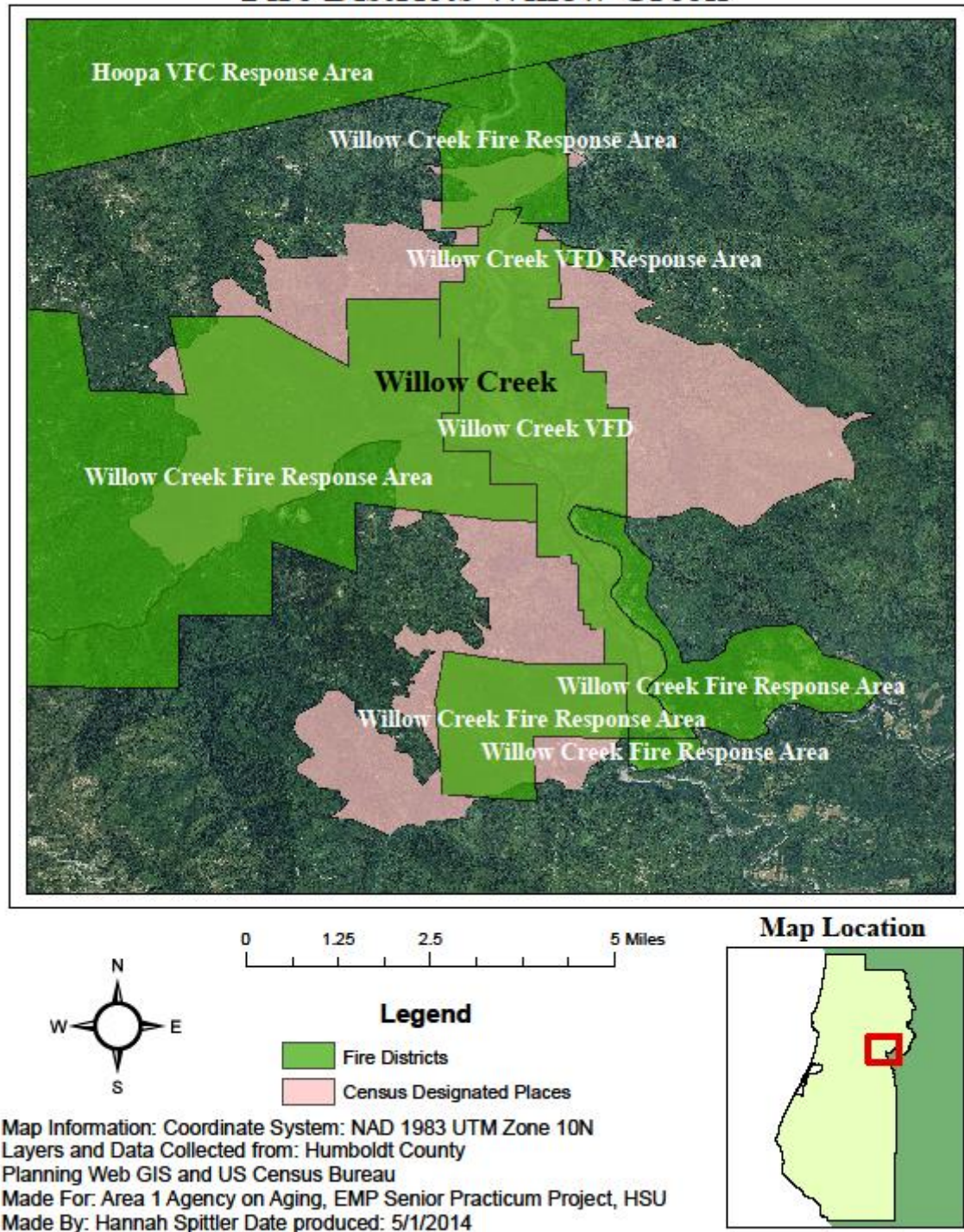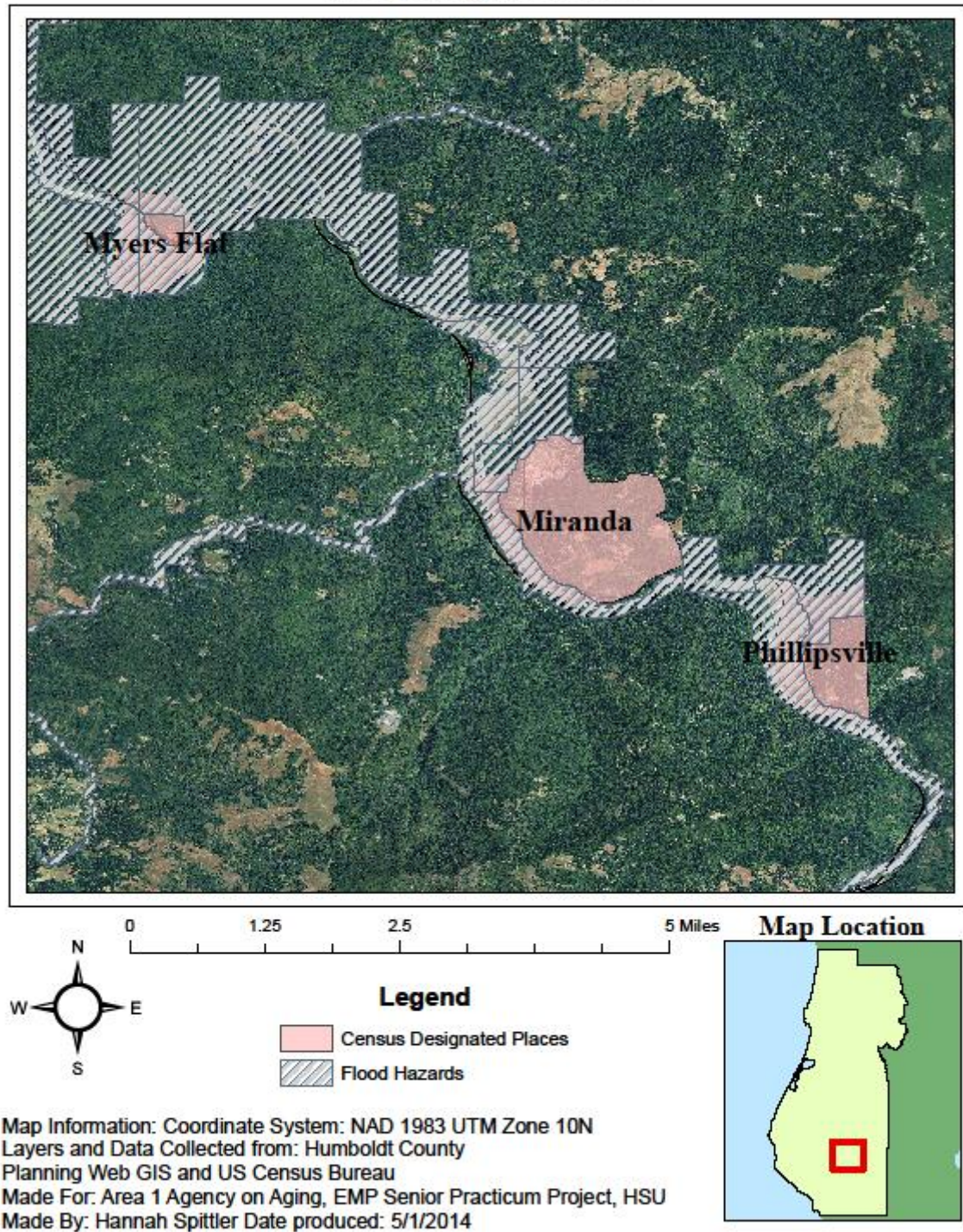Made By: Hannah Spittler Date produced: 5/1/2014

Figure 5.2

Figure 5.3. Produced by Redwood Coast Tsunami Working Group

Planning Conclusions:

Communities will need to respond and plan for changing demographics and aging populations if they want to be prepared to address the needs of the aging demographic. This does not mean simply adapting infrastructures to a citizenry's changing physical abilities and needs, but creating places where people can thrive. This requires a community which provides housing and transportation that allows people to live independently as long as possible. This can be achieved with a mix of zoning policy, private development, shuttles, and universal design principles.

People should have access to food, medical and social services, as well as feel welcome and safe in the places they call home. How communities address these issues will depend greatly on their specific demographics and the spatial distribution of local populations. Certain urban areas already have a myriad of services and transportation lines, while others may choose a neighborhood alliance approach. Shortages in housing can be ameliorated by zoning and hard infrastructure or by home modifications. Likewise, transportation needs can be met with public investment, or private social connections. Either way, the goals and objectives remain the same.

Regardless of the methods communities will need to retain a diverse age-structure to thrive economically, socially and culturally. Communities need to build for all peoples. Age-friendly places encourage equal access over convenience by supporting walkable and inclusive places, and allow people to adjust their lifestyles to their physical needs as they age in the place of their choosing.