

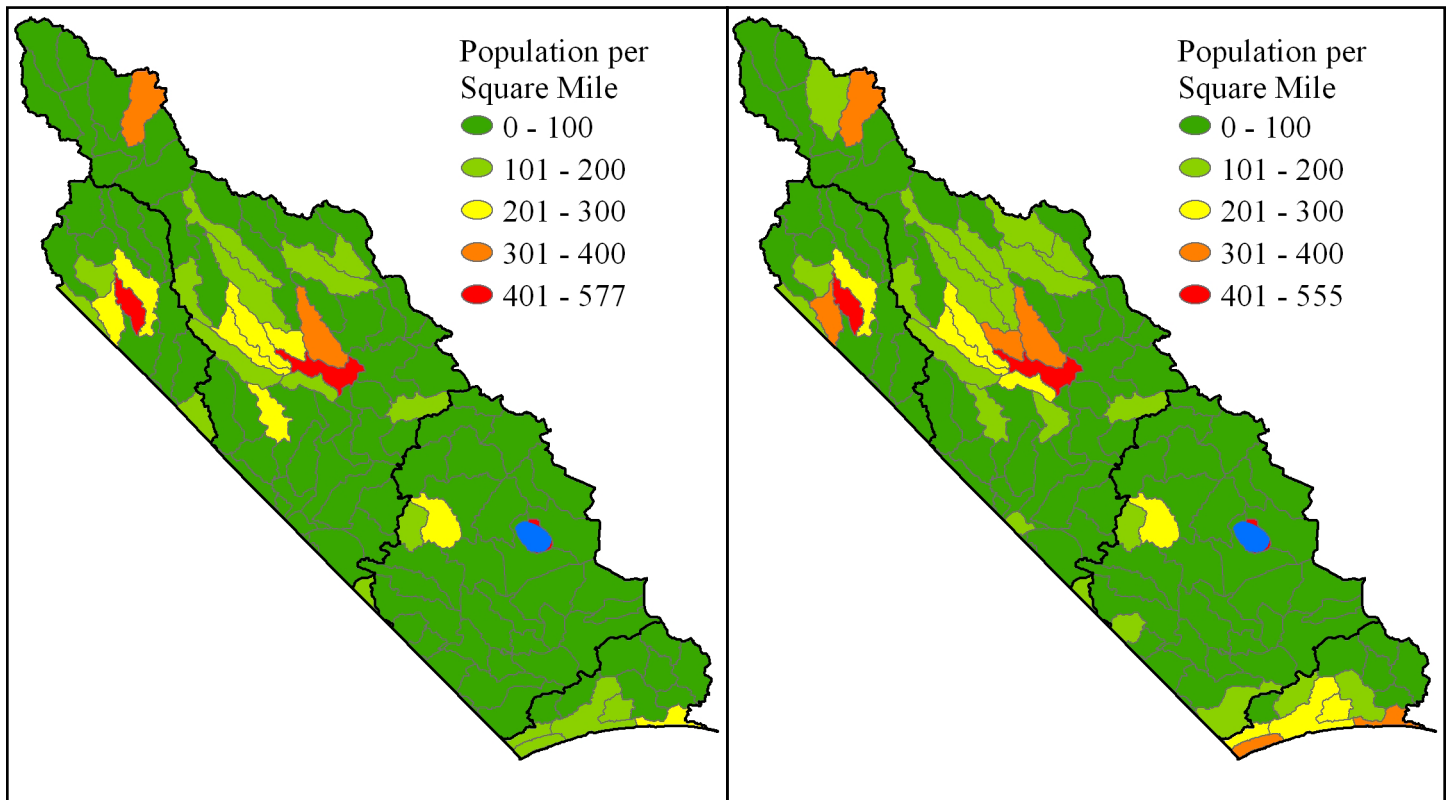
Chapter 6

Population and Land Cover

Population in the Lumber Basin

The population of the entire basin for the year 2000 was estimated at about 300,000 or about 90 people for every square mile. Population trends are not consistent throughout the basin. Two areas in the basin have been experiencing very rapid growth, that is expected to continue. While other areas are undergoing very little growth. The fastest growth is taking place in Brunswick, Hoke, and Moore counties with the development of retirement communities and golf courses (Table 6-1). The most populous areas occur around Southern Pines, Laurinburg, Lumberton, Whiteville, and along the Atlantic Coast in Brunswick County (Table 6-2). In addition to the permanent population living along the Atlantic coast in Brunswick County, the population escalates greatly in the summer with seasonal residents. Figure 6-1 shows population density by subwatershed based on the 1990 and 2000 census. As population throughout the basin grows, it increases pressure on the natural environment.

FIGURE 6-1: POPULATION DENSITY BY SUBWATERSHED FOR 1990 (LEFT) AND 2000 (RIGHT)



Land Cover in the Lumber Basin

Agriculture, Forest, and Wetlands account for three quarters of the land cover in the Lumber basin with each one making up about one quarter of the total area. In the Lumber and Little Pee Dee subbasins, agricultural use is slightly higher, but in the Waccamaw and Long Bay subbasins, forest and wetlands make up a larger percent of land use. Table 6-3 contains estimates for land cover percentages by type. Land cover patterns in the Lumber Basin mirror those of population. As an area becomes more populated the amount of impervious surface increases. Impervious surface estimates, by subwatershed for 2001, can be found in Appendix F Population and Impervious Surface.

TABLE 6-1: COUNTY POPULATION ESTIMATES AND PROJECTIONS

COUNTY	% OF COUNTY IN BASIN	2000 POPULATION	2007 ESTIMATED POPULATION	PERCENT CHANGE 2000 -2007	2020 PROJECTED POPULATION	PERCENT CHANGE 2000 - 2020
Bladen	31.19	32,278	32,500	0.7	32,629	1.1
Brunswick	56.17	73,143	99,440	36.0	147,370	101.5
Columbus	89.58	54,749	54,460	-0.5	58,968	7.7
Cumberland	1.98	302,963	313,616	3.5	345,007	13.9
Hoke	43.26	33,646	42,932	27.6	58,368	73.5
Montgomery	5.37	26,822	27,588	2.8	29,105	8.5
Moore	21.36	74,769	83,932	12.3	103,877	38.9
Richmond	19.00	46,564	46,662	0.2	47,460	1.9
Robeson	99.53	123,339	129,425	5.0	145,575	18.0
Scotland	99.87	35,998	36,830	2.3	41,420	15.1
Total	N/A	804,271	867,385	7.8	1,009,779	25.6

Source: Office of State Budget and Management, 2009.

Note: The numbers reported reflect county populations; however, these counties may not entirely be within the basin.

The intent is to demonstrate growth for counties located wholly or partially within the basin.

TABLE 6-2: MUNICIPAL POPULATION PROJECTIONS AND ESTIMATES

MUNICIPALITIES	COUNTY	2000 POPULATION	2007 ESTIMATED POPULATION	PERCENT CHANGE 2000-2007
Aberdeen	Moore	3,400	4,579	34.68
Bladenboro	Bladen	1,718	1,653	-3.78
Boardman	Coulmbus	202	195	-0.53
Boiling Springs Lakes*	Brunswick	2,972	4,115	38.46
Bolivia	Brunswick	148	171	15.54
Bolton*	Columbus	494	482	-2.43
Brunswick	Columbus	360	1,044	190.00
Calabash	Brunswick	711	1,435	101.83
Candor*	Montgomery	825	845	2.42
Carolina Shores	Brunswick	1,482	2,873	93.86
Cerro Gordo	Columbus	244	242	-0.82
Chadbourn	Columbus	2,129	2,113	-0.75
Clarkton	Bladen	705	765	8.51
Dublin*	Bladen	250	250	0.00
East Laurinburg	Scotland	295	289	-2.03
Fair Bluff	Columbus	1,181	1,214	2.79
Fairmont	Robeson	2,604	2,744	5.38
Foxfire Village	Moore	474	547	15.40
Gibson	Scotland	584	579	-0.86
Hoffman	Richmond	624	677	8.49
Holden Beach	Brunswick	787	931	18.30
Lake Waccamaw	Columbus	1,411	1,312	-7.02
Laurinburg	Scotland	15,874	15,875	0.13
Lumber Bridge	Robeson	118	120	1.69

MUNICIPALITIES	COUNTY	2000 POPULATION	2007 ESTIMATED POPULATION	PERCENT CHANGE 2000-2007
Lumberton	Robeson	20,795	22,929	10.26
Marietta	Robeson	164	159	-3.05
Maxton	Robeson/Scotland	2,551	2,539	-0.47
McDonald	Robeson	119	127	6.72
Norman*	Richmond	72	73	1.39
Oak Island*	Brunswick	6,571	8,261	25.72
Ocean Isle Beach	Brunswick	426	508	19.25
Orrum	Robeson	79	77	-2.53
Parkton	Robeson	429	545	27.04
Pembroke	Robeson	2,681	2,732	1.90
Pinebluff	Moore	1,109	1,360	22.63
Pinehurst*	Moore	9,729	11,632	19.56
Proctorville	Robeson	133	129	-3.01
Raeford*	Hoke	3,386	3,837	13.32
Raynham	Robeson	72	88	22.22
Red Springs	Robeson	3,493	3,509	0.46
Rennet	Robeson	283	348	22.97
Rowland	Robeson	1,146	1,167	1.83
Saint James*	Brunswick	804	2,445	204.10
Saint Pauls	Robeson	2,247	2,351	4.64
Shallotte	Brunswick	1,381	1,908	38.16
Southern Pines*	Moore	10,918	12,210	11.83
Sunset Beach	Brunswick	1,824	3,090	69.41
Tabor City	Columbus	2,509	2,544	1.39
Tar Heel*	Bladen	70	95	35.71
Varnamtown	Brunswick	481	583	21.21
Wagram	Scotland	801	775	-3.25
Whiteville	Columbus	5,148	5,091	-1.11

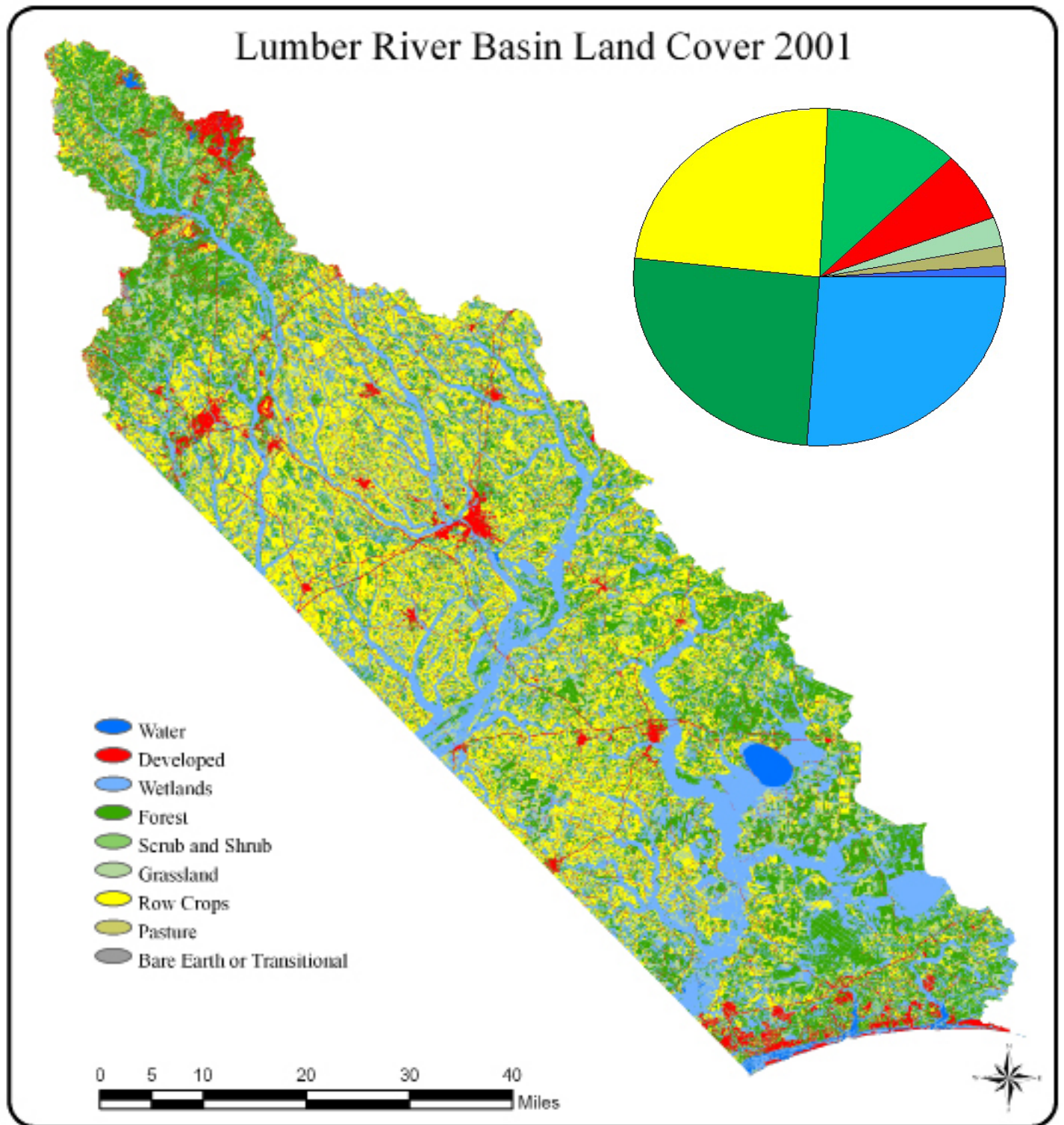
Source: Office of State Budget and Management, 2008.

*Denotes that the municipalities is only partial located in the basin.

Explanation of the Land Cover Data and Categories

The national land cover database (2001) is a geographic information systems raster file that was developed by the Multi-Resolution Land Characterization Consortium, which is made up of several federal government agencies. These agencies include the US Geological Survey, the Environmental Protection Agency, National Oceanic and Atmospheric Administration, US Forest Service, Bureau of Land Management, National Aeronautics and Space Administration, National Park Service, and Natural Resources Conservation Service. It was developed using multiple datasets including, three sets of infrared landsat imagery that were collected during the spring, summer, and fall seasons. This data was then improved upon using ancillary data files such as a 30 meter digital elevation model, population density, buffered roads, and city lights. The percent impervious cover and the percent tree canopy were created to show the intensity at which land was either developed or forested. For more information on this land cover data visit: Multi-Resolution Land Characteristics Consortium <http://www.mrlc.gov/>.

FIGURE 6-2: 2001 LAND COVER



Open Water - All areas of open water, generally with less than 25 percent cover of vegetation or soil.

Developed, Open Space - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

Developed, Low Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.

Developed, Medium Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.

TABLE 6-3: 2001 LAND COVER PERCENT BY TYPE

TYPE	ENTIRE BASIN	03040203	03040204	03040206	03040208
Developed, Open Space	4.8	5.2	5.4	3.5	6.7
Developed, Low Intensity	1.5	1.4	1.9	0.8	4.9
Developed, Medium Intensity	0.3	0.4	0.5	0.1	0.7
Developed, High Intensity	0.1	0.1	0.1	0.0	0.1
Developed	6.7	7.1	7.9	4.5	12.3
Forest, Deciduous	3.2	4.5	4.8	1.3	0.6
Forest, Evergreen	20.3	16.7	19.3	23.6	32.7
Forest, Mixed	2.2	2.3	1.8	2.4	1.5
Forest	25.7	23.5	26.0	27.3	34.8
Pasture/Hay	1.9	2.8	3.3	0.4	0.9
Cultivated Crops	23.9	27.6	27.6	20.3	8.9
Agriculture	25.9	30.7	30.9	20.7	9.8
Wetlands, Wooded	25.3	23.9	20.2	30.8	21.1
Wetlands, Emergent Herbaceous	0.8	0.4	0.2	0.7	5.2
Wetlands	26.1	24.3	20.4	31.5	26.2
Scrub/Shrub	2.8	2.4	2.4	3.6	4.4
Grasslands/Herbaceous	11.8	12.2	12.1	11.4	11.6
Bare Earth, Rock, Sand, Clay	0.1	0.0	0.3	0.0	0.9

Developed, High Intensity - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover.

Barren Land (Rock/Sand/Clay) - Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover.

Deciduous Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.

Evergreen Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage.

Mixed Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.

Shrub/Scrub - Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.

Grassland/Herbaceous - Areas dominated by graminoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

Cultivated Crops - Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.

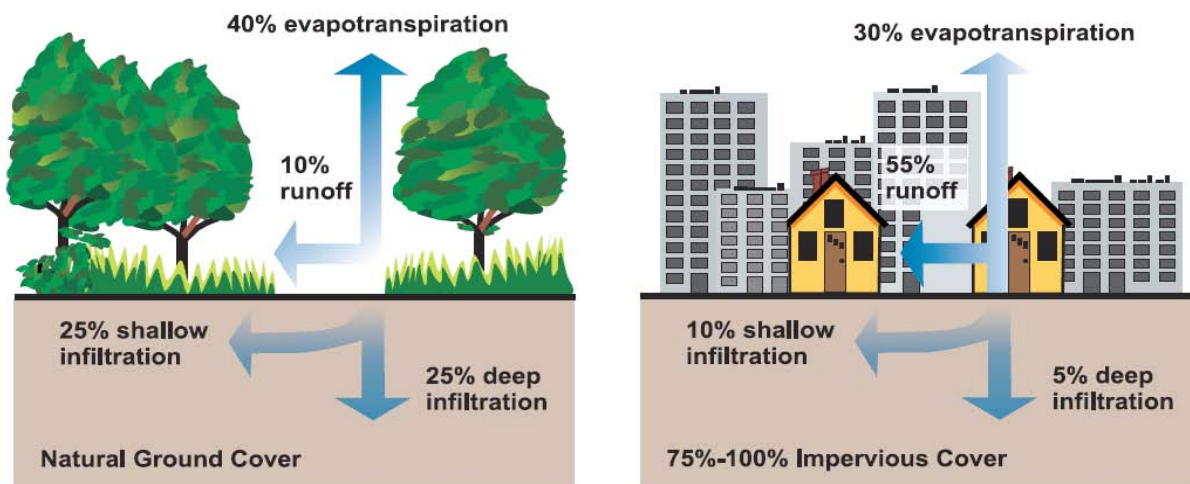
Woody Wetlands - Areas where forest or shrub land vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Population, Land Cover, and Stormwater

As population increases, so does the amount of land covered by impervious surfaces such as parking lots, roads, and roof tops. As impervious surface increases, the amount of precipitation that enters surface waters as runoff increases and the amount of precipitation infiltrating into the ground decreases (Figure 6-3). Increased stormwater runoff contributes to flooding during rainfall events and decreases the amount of groundwater available during droughts. Runoff harms aquatic life by physically and chemically altering the habitat. Increased flow creates greater erosion of stream channels and banks, as well as, the pollution load to water. In order to allow growth to occur but to maintain water quality a comprehensive stormwater program is necessary. Many areas throughout the basin have such programs in place but some areas are still lacking adequate protection from stormwater (Figure 6-4). For more information on stormwater and how to manage it refer to Chapter 5 of the Supplemental Guide to Basinwide Planning or visit DWQ's Stormwater Branch at <http://h2o.enr.state.nc.us/ws/>.

FIGURE 6-3: IMPERVIOUS SURFACE AND RUNOFF (EPA, 2003)



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

FIGURE 6-4: AREAS REQUIRING A STORMWATER PERMIT AND THE TYPE OF PERMIT REQUIRED IN THE LUMBER BASIN

