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Improving Forest Productivity for Timber: A Key to Sustainability

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While our nation's population, including most natural resource professionals, has maintained an emphasis on non-timber elements of ecosystem science and policy, it is essential to recognize that producing the timber products we need on a smaller, more intensively managed land base is a critical element of sustainability. As a nation, we are the major per capita consumer of wood products, yet we also lead the call for preservation of forests, often at the expense of more environmentally sensitive forests in tropical, third-world countries. As market-based, consumer oriented economies develop in China, Russia, and other populous countries, demand for forest products will threaten our ability to justify even basic best-management practices.

One effective response is to renew and strengthen forest productivity research and implement forestry practices that increase timber productivity and maximize product utilization, while sustaining basic ecosystem components and processes. Sustainability can be a complex and elusive goal that requires a lot of specialized expertise to plan and achieve. However, there are some practices that are easy to understand and implement that will greatly increase productivity and profitability while improving forest health and other components of ecosystem stability. One such practice involves simply leaving the right trees when thinning or "selectively harvesting" a forest stand. A video that comprehensively covers the topic, entitled "*I want to log selectively – A Practical Guide to Partial Timber Harvesting"*, is available for purchase or loan from local Extension and Idaho Dept. of Lands offices. A companion publication is also available.

On a recent field trip we were looking at about 120 acres of forest industry land that had been secured in a land-swap 20 years earlier. Over 1 million board feet (MMBF) of timber had been harvested from the tract in three entries over the last 20 years, yet current timber volume exceeded the original volume. This is not an isolated situation, but neither is it the rule. This desirable circumstance was the result of adept cut/leave selections made by the field foresters responsible, and was also a function of normal tree growth patterns and of how we measure and manufacture logs. The chart on page 2 clearly shows the value of maintaining growth on 12"-14" diameter trees for about 10-12 years until they reach 18"-20" diameter. For example, a 14" ponderosa pine tree 80' tall contains 138 board feet (bdft) worth about $69 at today's delivered log prices (less average logging/hauling costs, the owner would net about $48). If this same tree grows another 10 years to 18" diameter and 100' tall it would contain 339 bdft worth about $170 delivered, with a net after logging/hauling costs of about $120, based on today's values and costs. The diameter in this example increases 29%, but the delivered log value increases 146% and the net log value increases 150%. Some of this remarkable difference between diameter and volume is real (remember the area of a circle formula $a=pr^2$) because each inch of diameter growth occurs around an everlarger circumference. The difference is also attributable to the way the Scribner log scale used in our region estimates the number and size of boards that can be cut from each log.

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This information should encourage landowners to retain the larger, healthier trees for sustainable income and ecosystem health.

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Figure 1. Scribner Board Foot Volumne Table for Ponderosa Pine

	40	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**
Dbh (in)													
10	1	10	22	34	46	58	70	82	94				
12	19	36	53	71	88	105	123	140	157	174			
14	44	67	91	114	138	162	185	209	232	256	279		
16	73	103	134	165	196	226	257	288	319	349	380	411	
18	105	144	183	222	261	300	339	378	417	456	494	533	572
20	142	190	238	286	334	382	430	478	526	574	622	670	718
22					319	396	473	550	628	705	782	859	936
24					436	528	620	712	804	896	987	1079	1171
26					564	672	779	887	995	1103	1211	1319	1426
28					702	827	952	1077	1202	1327	1452	1577	1702
32					1008	1171	1334	1498	1661	1824	1988	2151	2314
34					1176	1361	1545	1729	1914	2098	2283	2467	2651
36					1355	1562	1768	1975	2182	2388	2595	2802	3009