



## **Forest Management Public Summary**

**for**

### **Sino-Forest Corporation/Gaoyao City Jaiyao Forestry Development Company, Limited**

Certification Code: SW-FM/COC-1146  
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No part of the report should be published separately.**

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## **ACRONYMS**

AAC	Annual Allowable Cut
ALP	Annual Logging Plan
CITES	Convention on Trade in Endangered Species
DBH	Diameter at Breast Height
DOC	Department of Conservation
FMO	Forest Management Organization
FSC	Forest Stewardship Council
GY	Gao Yao
HCVF	High Conservation Value Forest
ILO	International Labor Organization
JFDC	Jia Yao Forestry Development Company
OSH	Occupation Safety and Health
P&C	Principles and Criteria of the FSC
SFM	Sustainable Forest Management
SFMP	Sustainable Forest Management Plan

## **INTRODUCTION**

To earn SmartWood certification, a forest management operation must undergo an on-site field assessment. This Public Summary Report summarizes information contained in the initial assessment report, which is produced based on information collected during the field assessment. Annual audits are conducted to monitor the forest management operation's activities, to review the operation's progress toward meeting their certification conditions, and to verify compliance with the SmartWood standards. Addenda providing the updated information obtained during these annual audits are included as attachments to the Public Summary Report.

This report presents the findings of an independent certification assessment conducted by a team of specialists representing the SmartWood Program of the Rainforest alliance and. The purpose of the assessment was to evaluate the ecological, economic and social sustainability of Jia Yao Forestry Development Company's forest management.

The purpose of the SmartWood program is to recognize conscientious land stewardship through independent evaluation and certification of forestry practices. Forestry operations that attain SmartWood certification may use the SmartWood label for public marketing and advertising.

## 1. GENERAL SUMMARY

### 1.1. Name and Contact Information

**Source Name: Sino-Wood Partners, Limited**

**Contact Person: Miranda Lin and Run-Peng Wei**

**Address: 3129-40, 31/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong.**

**Tel: (852) 2893 9880**

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The Jia Yao Forestry Trade and Development Company is a joint venture between the Sino-Wood Partners Company, Hong Kong and the Gao Yao Forestry Department's Gay Yao Forestry Trade and Development Company (see section 1.3 D Administration). The above contacts are the overall contacts for the certification process. However, because the Jia Yao Forestry Development Company (JFDC), located in Gao Yao Municipality in Guangdong, is responsible for the management planning and implementation in the area assessed, the below contact has also been designated.

**Source Name: Jia Yao Forestry Development Company**

**Contact Person: Lu Qi Ding**

**Address: Jindu Town, Chengdong Industrial Zone, Gaoyoa City, Guangdong Province  
526100**

**Telp: 0758 8512824**

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**E-mail: [Jia YaoF@263.com](mailto:Jia YaoF@263.com)**

### 1.2. General Background

#### A. Type of operation

JFDC mainly deals with the establishment and management of forest plantations, aiming to provide raw materials for Gao Yao Wood Development Ltd. (GY Wood) and a paper pulp mill in Guangxi (for which there is a business relationship with Sino Wood Partners, Ltd., but now ownership.) See 1.3-D (Administration) for an explanation of GY Wood's relationship to JFDC.

JFDC primarily manages lands for which land-use rights have been transferred (by villages) to JFDC. JFDC also manages and does harvesting of forests established by the World Bank and subsequently bought by GY Wood.

In 2002 in Gao Yao, about 14,500 hectares of plantation was managed by JFDC, including eucalyptus, acacia and a small quantity of paulownia planted and distributed in 14 towns within Gao Yao municipality. Holdings of two of these towns, some 5337 ha, were included in this assessment.

Sino-Wood Partners, Limited has a nursery located in Gao Yao Municipality, which provides seedlings for JFDC.

**B. Years in operation**

JFDC was formed in 1995. The company began establishing plantations in 1997. Since that time every year has seen an expansion in operations through the acquisition of more village (collectively-controlled) land.

**C. Date first certified**

January 15, 2004

**D. Latitude and longitude of certified operation**

Huilong Township:

East E112-45-45 N22-59-00

West E112-36-30 N22-54-45

South E112-39-00 N22-53-35

North E112-44-50 N23-00-30

Baizhu Township:

East E112-22-20 N22-57-30

West E112-15-10 N22-55-00

South E112-18-45 N22-52-30

North E112-21-55 N23-01-15

**1.3. Forest and Management System**

**A. Forest type and land use history**

Jia Yao Forestry Development Co. Ltd. (JFDC) lands in Baizhu and Huilong Towns

Natural forests in the area were converted for other uses or degraded over the past thousand years, and there are no original natural forests remaining. The forest cover was only 0.2% in 1935 in Gao Yao. Natural forest cover in this area would be classified as subtropical seasonal rain forests, which are very diverse and highly productive.

Current forest cover was established by planted or natural regeneration, consisting mostly of Masson pine plantations established by aerial seeding and planting during the late 1970s and into the 1980s and 1990s. Slash pine plantations were also established in the late 1980s and 1990s. Eucalyptus was introduced to the area in the early 1930s.

Most of the current existing eucalyptus plantations were established under a World Bank loan project in 1992-1995 and by JFDC in 1997-2002. These eucalyptus plantations were established on the harvested areas of Masson pine and Slash pine plantations. Small portions of acacia plantation have been established since 1990s.

About 60% of the total land territory is low mountains and hills in Gao Yao Municipality. Land-use patterns are generally determined by topography – low-lying areas are used for reservoirs and fish ponds, hills are covered by plantations and economic trees, and areas in between are used for agriculture and human settlements.

Masson pine (*Pinus massoniana*) is the major managed native conifer species in Gao Yao Municipality. Eucalyptus (including *E. urophylla* S. T. Blakey and *E. grandis* Hill ex Maid ), Slash pine (*Pinus elliottii* Engelm.) and acacia are the major exotic species for timber production. JFDC Baizhu an Huilong Towns' plantations include 1,464 hectares of eucalyptus plantations

purchased from the World Bank loan project plantations established between 1997 and 2002, including over 3,000 hectares of eucalyptus and 600 hectares of acacia. The rotations range from only 6 years for eucalyptus to 8-10 years for acacia.

Native rare and endangered tree species in the area include Chinese cypress (*Glyptostrobus pensilis*) and Nanmu (*Phoebe zhennan*) etc., but which only could be found in a few places, such as Dinghushan National Nature Reserve in Zhaoqing City.

Managed plantation/forest types with the Latin names of major tree and understory species include:

**Coniferous species**

- Pinus massoniana*--- *Rhodomyrtus* --- *Dicranopteris* + *Blechnum* Ass.
- Pinus massoniana* --- *Dicranopteris* Ass.
- Pinus massoniana* --- *Baeckea* --- *Dicranopteris* Ass.
- Pinus elliotii*--- *Rhodomyrtus* --- *Dicranopteris* + *Blechnum* Ass.
- Pinus elliotii* --- *Dicranopteris* Ass.
- Pinus elliotii* --- *Baeckea* --- *Dicranopteris* Ass.

**Broadleaf species**

- Eucalyptus* --- *Rhodomyrtus* --- *Dicranopteris* + *Blechnum* Ass.
- Eucalyptus* --- *Dicranopteris* Ass.
- Eucalyptus* --- *Baeckea* --- *Dicranopteris* Ass.
- Acacia* --- *Rhodomyrtus* --- *Dicranopteris* + *Blechnum* Ass.
- Acacia* --- *Dicranopteris* Ass.
- Acacia* --- *Baeckea* --- *Dicranopteris* Ass.

**B. Size of forest management unit certified and forest use and area in production forest, conservation, and/or restoration**

**Table 1: Forest cover types for JFDC Huilong and Baizhu**

<b>Actual land use</b>	<b>Area (ha)</b>	<b>% total area</b>
Natural and semi natural forest	<b>0</b>	0
Forest plantations	<b>5,137</b>	98.1
Protected areas	<b>0</b>	0
Special management areas	<b>100</b>	1.9
Water (open water bodies > 1 ha)	<b>N/a</b>	n/a
Infrastructure	<b>0</b>	0
Other	<b>Not calculated</b>	
<i>Total Certified Area</i>	<b>5,237.10</b>	100%

**C. Annual allowable cut and/or annual harvest covered by management plan**

**Discussion based on original assessment:**

The annual harvest of GaoYai Jia Yao is influenced by internal and external controls. The AAC is not clearly defined. It was a precondition to certification to clearly set AAC in terms of area or volume control and explain how it is calculated.

### External Quota System

JFDC management is influenced by a national quota system. Each year a national quota for harvesting is set by the State Forestry Administration based on a five-year plan. On the basis of this figure, the quota for harvesting in Guangdong Province is approved by the Guangdong Forestry Bureau, which then establishes quotas for local Forestry Bureaus.

Table 2 below shows quotas set by the Gao Yao Forestry Bureau for the Municipality and for JFDC for 2000-2002. Note that the 2002 harvest approved for JFDC was 2.8 times the level of the centrally-approved quota for the region as a whole.

**Table 2: 2000-2002 Harvesting Quotas for Gao Yao Municipality and JFDC m<sup>3</sup>**

Year	Quota for Gao Yao Municipality	Quota for Gao Yao Jia Yao	Total Quota for Year
2000	30,000 m <sup>3</sup>	N/A (no harvest)	
2001	40,000 m <sup>3</sup>	15,000 m <sup>3</sup>	40,000 m <sup>3</sup>
2002	35,000 m <sup>3</sup>	98,000 m <sup>3</sup>	133,000 m <sup>3</sup>

Gao Yao Forestry Bureau officials state that although the harvest amount should not exceed the total growth in the entire municipality, JFDC is able to apply for an exception to the official quota for a nominal fee. The exception must be approved by the Gao Yao and Guangdong Forestry Bureaus. It is the understanding of the assessment team that an increase in the approved cut for JFDC certified forest areas must be supported by appropriate area and volume calculations for a sustained yield.

### Internal determination of annual harvest

**Area control.** Decisions on annual harvest levels are based on the desire of managers to harvest trees that have reached or passed the rotation age of 6 years. Because many new lands are being added to the company's management each year, managers do not use strict area control in determining harvest levels.

**Volume control.** JFDC foresters currently rely on estimates of standing volume and harvest volume in their projections of current and future growth and yield. JFDC staff indicated that the company is working to develop local yield tables and volume equations based on data from harvested trees, but at the time of assessment that work is still in progress.

**Growth.** Estimated target levels of 6 m<sup>3</sup> per mu for Eucalyptus, or 90 m<sup>3</sup> per hectare, are based on yields achieved by others and the estimates of Eucalyptus experts outside the company (e.g., staff of the Chinese Academy of Forestry and the Guangdong Provincial Forestry Bureau).

**Yield.** Actual yields for 2002 and 2003 will be calculated from actual field measurements of trees to be harvested. At present, yield projections for years 2004 and beyond are based on area and estimated growth per unit area, based on a harvested volume of 70 m<sup>3</sup>/ha for both eucalyptus and acacia. Actual yield, or harvest volume, is assumed to be 70% of the standing volume. Therefore a

target standing volume of 90 m<sup>3</sup>/ha (6 m<sup>3</sup>/mu) means a target harvest volume of about 70 m<sup>3</sup>/ha. Estimates of volume in Table 3 below are taken from the JFDC 2002-2021 Management Plan,

**Table 3\*: Estimates of volume (m3, ha)**

Town	Species	Standing Volume	Area
Baizhu	Eucalyptus (0-6 years)	23,869	1,880
Huilong	Eucalyptus (0-6 years)	18,670	1,086
World Bank project area			
Baizhu	Eucalyptus	none	none
Huilong	Eucalyptus (all 6+ yrs old)	93,845	1365
<b>Total Eucalyptus</b>		136,384	4,331
Baizhu	Acacia (0-6 years)	1939	356
Huilong	Acacia (0-6 years)	2084	233
<b>Total Acacia</b>		<b>4023</b>	<b>589</b>

\* Includes area for plantations 1-6+ years old but only includes volume information for plantations 6 or more years old. Therefore standing volume is not equal to area \* 90 m<sup>3</sup>.

Harvesting operations began in 2001. The 2001 harvest volume was 0 for Baizhu and 15,000 m<sup>3</sup> for Huilong. Projected harvests for 2002-2010 are provided in Table 2, below.

**Table 4: Actual and projected harvest levels for Huilong and Baizhu, 2002-2010 (m3)**

	Eucalyptus	Acacia	Total
2001 (actual*)			15,000
2002 (projected**)	33,555	0	33,555
2003 (projected)	51,302	0	51,302
2004 (projected)	33,744	7070	40,814
2005 (projected)	21,293	11,402	32,695
2006 (projected)	68,961	14,651	83,612
2007 (projected)	54,451	3,952	58,403
2008 (projected)	17,955	0	17,955
2009 (projected)	58,688	0	58,688
2010 (projected)	80,173	0	80,173

\* Data from e-mail from Miranda Lin, July 9, 2002.

\*\* Data for 2002-2010 from the “2002-2001 Nian Jihua Kan Caifa Tongji Biao”.

The assessment team requested data on the total projected volume for the holdings only in Huilong and Baizhu. This data was not available at the time of the assessment.

Information provided to the assessment team for Huilong and Baizhu was aggregated with data for surrounding communities that are part of the larger JFDC operations. This information below does not represent the assessment area with complete accuracy. This information is given only to provide a general understanding of the company’s scope of operations, current management style, and intentions.

A precondition to certification would be for the company to provide information specifically for the area to be certified.

**Discussion regarding findings from auditing of AAC related precondition in October 2003:**

Precondition 5 stated that:

*‘Prior to certification, JFDC shall revise the current management plan (or add supplementary information) to provide clear data for the areas under assessment for certification, i.e., Baizhu and Huilong.’*

In compliance with this pre-condition JFDC added section 14 to the management plan. This section states that the JFDC’s plantations under FSC certification assessment in Huilong and Baizhu are in total 5,237.1 ha (2,886.48ha in Huilong and 2,350.62ha in Baizhu).

The area accounts for 38.03% of the total area of the plantation up until the end of 2002, and 15.71% of the total area by the end of 2006 (33,333.33ha, a fixed area since then). There is not any expansion planned for these two towns after 2002. Sustainable harvest projection was separately made for Huilong and Baizhu. In Huilong, harvest area will be close to the ideal value (481.8ha/yr, the total area divided by 6), but uniform age distribution will not be achieved before 2011. In Baizhu, harvest area can exactly be equal to the ideal value (391.77ha/yr), but uniform age distribution will not be achieved before 2009.

JFDC’s total planned plantation area is 33,333.33ha. By the end of 2002, the realized area was 13,772.1ha. It is planned that the newly expanded area by the end of 2006 will be 19,561.25ha.

**Original Assessment Report Continues**

For the larger management area, the total land area is 13,772 ha. At the time of the assessment, the company planned to add an additional 33,300 ha by 2006 and a further 20,000 ha by 2021, bringing the future total to just under 98,000 hectares.

**Table 5: Planned land acquisition and management base for Gao Yao (Management Plan, Section 2.3.2 and 3.1) Unit: ha**

Time period	Beginning land base	Planned acquisition	Ending land base
2001			13,772
2002-2006	13,772	33,300	47,072
2007-2021	47,072	20,000	67,072

Of the 13,772 ha currently established, current volume is about 400,000 m<sup>3</sup>, of which about 131,000 m<sup>3</sup> is in plantations 3-6 years old, with the remaining 269,000 m<sup>3</sup> in plantations 7+ years old. Most of the area (92%) is in eucalyptus, with the remaining 8% in acacia. All plantations established by the World Bank were eucalyptus.

**Table 6: Planned timber volume and production for the GaoYao area (Management Plan, Section 2.3)**

Time period	Timber volume	Planned average annual production
2001	400,000 m <sup>3</sup>	15,000 m <sup>3</sup>
2002-2006	not specified	122,000 m <sup>3</sup>
2007-2021	1,900,000 m <sup>3</sup> by 2021	290,000 m <sup>3</sup>

## **D. General description of details and objectives of the management plan/system**

### ***Overview***

The management approach of JFDC is one of rapid expansion and maximization of production. The Management Plan calls for an increase in the area of land managed by JFDC over the next twenty years from 13,772 to 97,733 hectares and an increase in average annual production from 15,000 m<sup>3</sup> in 2001 to 122,000 m<sup>3</sup> in 2002-2006 and 290,000 m<sup>3</sup> in 2007-2021.

Goals stated in the Management Plan (see below) and by the forest managers indicate a clear emphasis on maximizing timber production. JFDC staff indicate that non-timber objectives are also important, but the company and its managers do not appear to have clearly defined which non-timber goals are important, what specific non-production goals should be, or how to achieve those goals.

### ***Management Plan***

In 2001, JFDC drafted a long-term Management Plan which appears to be based largely on the FSC's P&C. The Plan mentions many areas of concern to JFDC but, apart from well-defined goals for timber production and land acquisition for plantation establishment, does not yet provide clear guidance for defining or meeting specific objectives.

JFDC staff indicates the Management Plan is to be revised every year. Since the plan was only written in 2001, there have not yet been any revisions. The Management Plan covers two stages. The first, 2002-2021, is divided into two periods, 2001-2006 and 2007-2021. The second stage, 2022-2051, is referred to in the document title, but no information is provided on management for 2022-2051 except in certain appendices. Future volumes are based on general yield estimates not specific to Gao Yao operations.

### ***Administration***

The internal and external organizational structure of JFDC is extremely complicated.

#### *External administration.*

JFDC is the "child" of two "parents", formed in 1995 by the Gao Yao Forestry Trade and Development Company and Sino-Wood Partners/Sino-Forest Corporation.

Parent #1: The Gao Yao Forestry Bureau is not able to do business because it is a government agency. It therefore created the Gao Yao Forestry Trade and Development Company so that it could legally conduct business operations.

Parent #2: There is one company known as the Sino-Forest Corporation in Canada and Sino-Wood Partners in Hong Kong. Sino-Wood Partners operates 5 companies that manage over 100,000 hectares of land.

The Forestry Trade and Development Company and Sino-Wood Partners together created two companies – the Jia Yao Forestry Development Company (JFDC) and Gao Yao Wood (GY Wood). GY Wood is a separate company and therefore was not included in this certification assessment.

GY Wood is responsible for paying fees and taxes related to the World Bank-funded forestland. There will be a sum of money, not yet determined, paid by GY Wood to JFDC for managing and harvesting the World Bank-funded forestland.

At present there are three vice general managers in charge of the routine work of JFDC: Mr. Lu Qiding, a representative of Sino-Wood Partners, Limited, Mr. Gan Wenyong, a representative of Gao Yao Forestry Trade and Development Company, and Mr. Wu, who is in charge of the financial work of JFDC. Much of the company's on-the-ground work is conducted by government employees at local Forestry Stations. These employees are paid by JFDC for the portion of their time that is spent doing work for JFDC, (which may be as much as 80% of their time).

#### *Internal administration*

Sino-Wood staff in Hong Kong provide the highest level of oversight for JFDC operations. There are 17 JFDC staff members in the office in Gao Yao City. The three main administrative units are Reforestation, Protection, and Harvesting (road construction, annual implementation, and regeneration).

#### *Management systems*

##### *Silviculture*

JFDC uses even-aged management exclusively, clearcutting eucalyptus and acacia plantations after 6 years.

##### *New Plantations and Planting*

Both Eucalyptus and Acacia were planted until 2000, and all plantings since that time have been Eucalyptus. Most Eucalyptus seedlings planted from 1997-2001 were grown from seed, but beginning in 2002, all seedlings planted are clones, grown from vegetative cuttings in the nursery. New plantations are planted by hand with Eucalyptus clones. In 2002, seedlings representing 3 clones were planted. Plantings are at a density of approximately 1665 stems/hectare. Site preparation for new plantations includes burning.

##### *Tending*

###### *Year 1*

For all plantations, manual release is done (1-m circle around the stem) in the first year of plantation establishment and is not repeated.

Fertilizer is applied at a rate of 39 kg/mu, or 585 kg/hectare. Fertilizer, bought from an outside source, is a mixture of chemical, organic fertilizer, and other materials. It is at least 30% by weight chemical (NPK – the exact mixture is proprietary information of the supplier) and 70% a mixture of organic fertilizer and other materials.

###### *Year 2*

Fertilizer is applied at a rate of 585 kg/hectare.

##### *Management of coppice stems*

Eucalyptus stems are allowed to coppice. (Acacia stems do not coppice). Stumps are allowed to coppice, and thinning of coppice stems occurs about 2 or more months after harvest, as needed. Some areas may be thinned more than once.

If seedlings regenerate at a rate of less than 1200/ha, the company will plant the subcompartment. Expected standing volume at harvest is 90 m<sup>3</sup>/ha, 6 years after establishment, for both species.

##### *Replanting*

After two rotations of eucalyptus, acacia will be planted in an effort to increase diversity.

### ***Forest inventory***

JFDC established a series of 20 permanent plots in 2001 for plantations. Plots are to be re-measured every year. Parameters measured include dbh, volume, survival, planting density, and information on understory vegetation. Data is sent to the Hong Kong office for analysis.

In addition, in 2001 sample plots were taken in 33% of the sub-compartments for plantations established in 1997-1999, with 3-8 plots per sub-compartment. Parameters measured included dbh, height-growth, and count per dbh class. Data is sent to the Hong Kong office for analysis.

Before harvesting, measurements are taken in every harvest unit to estimate volume as required by China's Forestry Law.

JFDC plans to develop local yield tables and volume equations.

### ***Biological inventory***

None, other than collection of data on understory vegetation on permanent growth plots.

### ***Harvesting and road systems***

Trees are harvested by contracted crews that use chainsaws to fell trees. Current harvesting methods result in a stand that is completely cleared, with no remaining tree or shrub layer except for occasional bamboo. Trees are limbed and debarked on-site, then carried by hand to the road. Logs are placed in small piles along the road and inspected by a JFDC forester, who may require additional debarking. Logs are loaded on to trucks and transported directly to the buyer.

Forest maps show a system of roads that include Main roads, Simple roads, and footpaths. Main roads are made of cement. "Simple Roads" are dirt roads, usually on relatively flat land, that connect villages and are used on a daily basis by villagers. Some footpaths are accessible by motorcycle. Roads to the interior of harvest units are constructed with heavy machinery and after use are planted with trees. Roadwork is often done with villagers providing labor and JFDC providing materials such as rock.

Harvesting and road-building operations are done year-round. Approximately 1/3 of the logs are harvested in the rainy period, April – September.

The basic management unit is the sub-compartment, generally 12-20 hectares in size and bounded by natural boundaries such as ridges, roads, watercourses, and well-established footpaths. Boundaries are not marked in the field.

### ***Interaction with the local community***

All lands managed by JFDC belong to local villages. Village representatives, the local Forestry Bureau, and JFDC enter into a legal agreement to transfer use rights to the company. Villagers are to receive 30% of the timber at harvest and so have a vested interest in the success of the plantations.

## **1.4. Environmental and Socioeconomic Context**

### **Environmental Context**

Through the afforestation and greening program in the past, especially in the last 20 years, forest cover in Gao Yao Municipality has increased by about 56%, and soil and water erosion has been

reduced. Government statistics indicate that about 95% of the total forestry land in Gao Yao Municipality is now forested. (This estimate seemed too high to the original assessment team.)

A national forest zoning policy classifies forests as “ecological services forest” or “commercial production forest”. “Ecological services forests” are off limits to timber harvesting and provide public services, such as soil erosion control, water resources conservation etc. These forests are in the early stages of recovery. Basic information on ecological services forests in Gao Yao was not available to the assessment team.

In areas zoned for commercial forest, the conversion of the Masson pine plantations into eucalyptus plantation may affect the process of restoration. Development of plantations of exotic fast-growing tree species will increase timber yields in the short term but may have long-term impacts on the restoration of native species and the sustainable productivity of the forestlands.

Use of the chemical fertilizers may negatively impact water quality of ponds and reservoirs. Also water resources conservation may be affected if the expansion of the high water demanding eucalyptus plantations is too fast.

The annual harvesting of commercial timber in Gao Yao Municipality was 30,000 m<sup>3</sup> in 2000 and 40,000 m<sup>3</sup> in 2001, including 15,000 m<sup>3</sup> for JFDC’s timber harvesting. The annual harvesting in 2002 is 35,000 m<sup>3</sup> for Gao Yao Municipality, plus 98,000m<sup>3</sup> just for JFDC. There is a significant increasing of the total harvesting amount of commercial timber in 2002. This increase comes from the final harvesting of the eucalyptus plantations purchased by JFDC and the Masson pine plantations for JFDC’s expansion to establish new eucalyptus plantations.

There is no clear list of rare and endangered species of wild flora and fauna in the local government agencies or in JFDC’s office. No Natural Reserves have been established in the assessment area. Ten forest parks have been proposed but only one of them has been approved by Guangdong Province so far.

### **Socioeconomic context**

Gao Yao Municipality, population 800,000, falls in the category of mountainous region. The hilly land of Gao Yao covers an area of 120,000 hectares, or 79.13% of the total area. Gao Yao is a municipality under Zhaoqing City. It’s located about 100 km west of Guangzhou City, capital of Guangdong Province. Gao Yao has 19 towns, including Huilong and Baizhu. Throughout the province of Guangdong on the whole, Gao Yao is at the medium level in terms of economic development. Huilong and Baizhu are at the mid-upper level in terms of economic level.

In China, land is state-owned and use-rights are collectively owned. Before a land-use contract between a company and landowners is signed, farmers’ representatives, who are elected by farmers themselves, are organized to have village meetings (often in “economic cooperatives). In these meetings they decide whether or not to transfer use rights and to come up with acceptable terms. In general, the maximum time period for the transfer of land-use rights is 50 years.

Baizhu has 19 administrative villages (an administrative village consists of several geographically separated natural villages) and 8240 households, with a population of 31903. The main income sources for farmers are rice, vegetables, fruit, animal husbandry (pigs, chickens and ducks) and aquaculture (fish). In addition, farmers have some income from bamboo, pine trees, and bees. The resin collected from Masson pine is sold at 3 yuan/kg, and that from slash pine at 2.4 yuan/kg. For a long time (60 yrs.) the income from pine trees has been about 5 yuan/mu/yr. (One mu = 1/15 hectare.) It’s believed that the income from eucalyptus plantation is at least 10 times as much as

that from pine trees. On the average, the annual income of the farmers in Baizhu ranges from 4300 yuan/person in the village of Jinpingchang to more than 5000 yuan/person in the villages of Dajitou and Oucun.

Huilong has 11 administrative villages and 4412 households, with a population of 17445. The main income sources there are rice, vegetables, fruit, animal husbandry (pigs, chickens and ducks) and aquaculture (fish) and export of labor force. Additional income comes from pine resin, which is about 8 – 10 yuan/mu/yr, and sparsely grown bamboo. It's believed that the income from eucalyptus plantation is more than 3 times as much as that from pine trees. The annual income in this town ranges from 4500/person in Liucun Village to 5000 yuan/person in Chenghu Village.

## 1.5. Products Produced and Chain of Custody

### A. Chain of custody certificate

The “forest gate” (the final point at which the operation guarantees that a product is sourced from the forest area evaluated) is logs that have been loaded directly onto trucks *without* first having gone to a landing (it is remotely possible that logs from non-certified operations could be mixed in at a landing location). All eucalyptus and acacia in the area is managed by JFDC, and as long as this is the case there is no risk of contamination from local sources.

Excellent tracking measures are already in place and would only have to be modified slightly to ensure identification of individual loads of logs as having originated from certified lands. By adding information regarding certification status on trip tickets currently used, the “forest gate” can be extended to the point of delivery of individual loads of logs.

A separate chain of custody system will need to be put in place at GY Wood's particleboard factory to separate certified from non-certified logs delivered and production.

### B. Species and volumes covered by the certificate

**Table 7: Certified Production**

Species	Scientific name	Volume (m <sup>3</sup> per yr)	Product
Eucalyptus	<i>E. urophylla</i>	All (see Table 4)	Particleboard, pulp, pallets
Acacia	<i>Acacia magium</i>		

JFDC aims to have all production in the Baizhu and Huilong areas certified. See Table 4: Actual and projected harvest levels, 2002-2010 (m3).

### C. Description of current and planned processing capacity covered by the certificate

The JFDC is currently involved in three areas of timber processing - particleboard, pulp and pallets. Of JFDC's total production, 20% goes for particleboard (this represents about a third of the mill's raw material input), 70% goes for pulp in Guangxi, and the remaining 10% is used by the local communities to produce pallets.

The annual potential capability of GY Wood's particleboard mill is 100,000 m3 of particleboard, but actual production is approximately 36,000 m3 per year. In total, 54,000 m3 of logs are processed every year, including 27,000 m3 (50%) of eucalyptus, 18,900m3 (35%) of Pine and 8,100

m3 of mixed wood. Approximately 10,800--16,200 m3 of eucalyptus are bought from JFDC for particleboard production.

To be certified, particleboard from the GY Wood factory will need to have a minimum of 30% certified content for particleboard; paper from the mill in Guangxi would need a minimum of 30% certified fiber (50% in 2005 and beyond).

## 2. CERTIFICATION ASSESSMENT PROCESS

### 2.1. Assessment Dates

#### 2002

June 25	Initial team planning
June 26-29	Field assessment at CFF
June 26-27	Public stakeholder meeting at local villages
June 29	Interviews with stakeholders; Begin report write-up
June 30	Report write-up; Review of general findings with client
July 1-2	Report write-up on-site; interview at Forestry Station
July 30	Draft report to SmartWood Task Manager (Regional Coordinator) & SWHQ
August 30	Draft report to JFDC for initial review & fact-checking/comment
October 10 & 17	Comments received from JFDC
October 30	Draft report to peer reviewers
November 11 & 22	Comment back from peer reviewers
December 18	Final Draft Report with Preconditions submitted to JFDC & SWHQ

#### 2003

October 13-17	Precondition Verification Audit
November 15	Precondition Verification Audit report to JFDC
December 18	Certification Decision Memo Issued, All preconditions closed
February 2004	Certification Contract signed and received by SmartWood

### 2.2. Assessment Team and Peer Reviewers

**Claralynn R. Nunamaker**, Team Leader, Private consulting forester. M.S. Natural Resources – Forestry and M.S. Environmental Systems Engineering, Humboldt State Univ., Arcata, CA. California Registered Professional Forester #2606. SmartWood certified resource manager under Forest Management Associates. Experience in conducting inventory cruises, writing harvesting and management plans, forest ecology and social forestry research. Research for masters thesis and masters project was conducted in Linan County in 1992. Previous certification involvement includes 10 assessments, scopings, or audits as well as SmartWood Team Leader training.

**Zhu Chunquan**, Forest Programme Officer, PhD, World Wild Fund for Nature China Programme Office. Member of the Working Group to develop certification standards for China.

**Yanru Zeng** Associate Professor of the Dept. of Life Science and Director, Research Center for Women and Natural Resources Management, PhD Candidate, Zhejiang Forestry College, China, with experience in biotechnology in the field of forest tree genetics and breeding, economic forestry (non-timber forestry) and women and natural resources management.

**Adam Grant**, Private consulting forester. Has five years project and research experience in social forestry and community based natural resource management. Since 1998, he has worked in Southwest China in the province of Sichuan and the autonomous region of Tibet. Additionally, he has three years experience working as a timber trader in the United Kingdom. Holds a Master of Science degree in Renewable Natural Resources and Development from the University of East Anglia, United Kingdom.

### **Pre-Condition Audit Team**

**Walter Smith, Team leader, Senior Technical Specialist, Rainforest Alliance/SmartWood.** Walter has 17 years experience in logging, training and forest resource management and 13 years experience in Forest Stewardship Council (FSC) forest management and chain of custody certification. He is a founding member of the FSC and was on the original FSC Principles and Criteria Working Group in the early 1990's. Walter began working with SmartWood in 1995. Since then he has been a team leader on over 100 forest management and chain of custody assessments and audits in Canada, China, India, Indonesia, Japan, Malaysia, Nepal, Philippines, Singapore, Vietnam and all regions of the United States. Additionally, is a principal instructor for the SmartWood Assessor Training Program and has participated in 18 training workshops in those countries. Walter is the co-author of a book on certification with Chris Maser.

**Adam Grant, Asia Pacific Forester, Rainforest Alliance/SmartWood.** Since the initial assessment in 2002 Adam has joined the Rainforest Alliance/SmartWood program as regional forester based at the Asia Pacific office in Jakarta, Indonesia.

Two independent peer reviewers with expertise in forest management in China were contracted to submit and independent evaluation of the quality of the original assessment report.

### **2.3. Assessment Process**

During the field phase of assessment process, the team conducted the following steps as part of the normal SmartWood certification process.

- 1) **Pre-Assessment Planning and Documentation review** – Prior to the assessment JFDC was asked to supply all relevant documentation to the team so that team members could consult the documents before arriving at the site. Major documents included a Roads Plan (2002 Niandu Linqu Daolu Weixiu Jihua), a Harvesting Plan (2002-2003 Niandu Rengong Lin Caifa Jihua), an Environmental Impact document (Huanjing Yingxian Baogao), and a Management Plan for 2002-2021. Unfortunately, of all these documents, only a 1-page summary of the management plan was available in English.
- 2) **Selection of Sites** – After the initial meetings with JFDC, the assessment team asked to visit sites representative of current, past and future logging activities, any timber processing sites, problem areas, areas of road construction, etc. On the social side, the team asked to visit villages that were poor, average and rich, contractors, workers, and villagers. This was done so that the team could develop a broad understanding of the operations of JFDC. The selection of sites was made based on review of the pre-assessment materials, interviews with staff, forest management practices and policies, and the indicators to be evaluated by members of the assessment team. The selection of sites was random, based primarily on accessibility to the type of stands, operations and villages the assessors requested to view. Sites visited included:
  - Recent harvesting sites

- Current harvest sites
- Future harvesting sites
- Protected areas
- Areas of new road construction
- Wetland and riparian areas
- Poor, average and rich villages

At the time of the precondition audit, additional sites were selected for inspection, these are shown in the following table:

### 3) Pre-Condition Audit Process

**Planning and Documentation review** – Prior to the audit JFDC were asked to supply all the relevant documentation to the team members for them to review before the start of the audit. In addition JFDC supplied a thorough progress report on the work that had been carried out over the last year to meet the requirements of the pre-condition set in the assessment in 2002.

**Selection of Sites** – After the initial meeting the assessment team asked to visit sites that would be able to demonstrate the work that had been carried out over the last year and outlined in the supplied Progress Report. The selection of sites was based on review of the pre-assessment materials and discussion with the staff of JFDC, forest management practices and policies and the particular requirements of each pre-conditions. Sites visited included:

- Over mature harvest sites – World Bank plantation site
- Environmental Sensitive Areas
- Set Aside areas
- Steep Slope sites (25°+)
- Planting/Regeneration sites
- Riparian Zones

### 4) Field Interviews/Stakeholder consultation – The on-site assessment was conducted from June 25<sup>th</sup> to 1<sup>st</sup> July 2002.

June 25<sup>th</sup> – the assessment team met and planned the assessment and reviewed management procedures, policies and management plans.

June 26<sup>th</sup> – an all day meeting was held with the JFDC and Sino– Wood partners staff. Present were Lu Qi Ding and Gen Wen You, the vice directors of JFDC, and the heads of all management departments. The representatives for the Sino-Wood Partnership Company were Farlay Tu, Miranda Lin and Jayco Fung. The purpose of this meeting was to develop a general understanding of how the JFDC is managed.

June 27<sup>th</sup> and 28<sup>th</sup> – two full day field visits. The team visited numerous sites and stakeholders see table 8, section 2.5 and appendix I for more detail.

Field sites visited:

- Eucalyptus plantations established in 1997, 1998, 2000, and 2001;
- active harvest site (eucalyptus);
- site harvested in 2001, using coppice regeneration (thinned);
- Ecologically Sensitive Area established for the Yangme Reservoir;

- Acacia plantation established in 1999;
- areas planted with eucalyptus and acacia under the World Bank project in 1992-1993, now ready for harvest;
- areas to be converted from Masson pine to eucalyptus;
- SanAnKeng plantation base set up by the Gao Yao Forestry Bureau;
- permanent sample plots;
- area of active hillslope erosion;
- area of new road construction (completed in 2001);
- areas of new road construction (completed in 2002);
- areas of active road maintenance;
- riparian areas (limited to edges of fishponds—JFDC indicated there were no watercourse crossings)
- nursery;
- the JFDC office in GaoYao;
- one of the field Forestry Stations (Baizhu);
- GY Wood particleboard factory;
- National Ecological Forest Area for Public Benefit.

June 29<sup>th</sup> – half-day field visits (to the Gao Yao Forestry Bureau, the Gao Yao Hydrological Bureau, the Gao Yao Environmental Bureau, and villages); half-day report writing and document review.

June 30<sup>th</sup> –half-day meeting with JFDC and Sino–Wood Partners staff; half-day report writing and document review. The purpose of the meeting was to give JFDC feedback on the assessment and outline the team’s preliminary findings. In addition JFDC were given the opportunity to ask questions and clarify any misconceptions that may have arisen.

July 1 – report writing and document review; visit to Baizhu Forestry Station.

July 2 – report writing and document review.

**Pre-Condition - Field Interviews/Stakeholder consultation** – The on site pre-condition audit was conducted from the 13<sup>th</sup> October 2003 to the 16<sup>th</sup> October 2003.

13<sup>th</sup> October 2003

Half day meeting with the Sino Forest team in the Hong Kong office. Held a discussion covering the progress that had been made over the last year and reviewed the Progress Report. In the afternoon the audit team and the Sino Forest team comprised of Run-Peng Wei - Director of Research and Development, Senior Research Scientist, Miranda Lin - Environmental Officer and Jayco Fung - Forest Management Information Systems Officer traveled to Gao Yao and held an introductory meeting for the assessment team and the JFDC staff.

14<sup>th</sup> October 2003 – In the morning the team visited the Gaoyao field office and held interviews with Lu Qi Ding - Executive Vice General Manager, Senior Engineer, Zhang Qi Ming-Vice Manager of Forest Resources, Liu Yuan-Vice Director of Administration, Xuan Rui Guang-Vice Manager of Silviculture, Forest Engineer and Zhiang Ying Wu - R&D assistant. During these interviews relevant documentation was inspected. In the afternoon field visits were conducted to the following sites:

- Ecological Service Forest, lake for drinking water and erosion control
- World Bank plantation
- Coppice system
- World Bank eucalyptus clearcut August 2003
- Steep slope sensitive area eucalyptus planting
- Acacia Plantation

15<sup>th</sup> October 2003 – Site visits and document review and report writing. Sites visited included:

- 1998 Agroforestry plantation management
- 2002 Eucalyptus planting
- Sensitive area, lake for fowl and irrigation and old landslide site
- Acacia plantation

16<sup>th</sup> October 2003 – The final day of the audit was used to re-review all documentation in light of the findings from the previous days and address any issues that arose through the process. In the afternoon a feedback meeting was held with the JFDC and the Sino forest staff.

- 3) **Assessment Report Development** – The assessment report was developed over a 24-day period after the fieldwork was completed.
- 4) **Report Review by Candidate Operation and Independent Peer Reviewers** – The assessment report was reviewed by operation and two independent peer reviewers.
- 5) **Certification Decision** - The certification decision was made by SmartWood headquarters. This was completed after review the assessment report and comments made on the draft report by operation and peer reviewers.

**Table 8. Summary of Forest Areas & Areas Visited by SmartWood Assessors**

<b>Forest/Block Name/Subcompartment</b>	<b>Total Area in Hectares</b>	<b>Assessment Site</b>
Baizhu/Xiapo Village/#26 & 27	22	X
Baizhu/Liuxu Village/Yangme Reservoir/#6 and #2	16 (#6) 24 (#2)	X
Gao Yao National-Level Ecological Services Forest	6,667	
Baizhu/Hedong Village/#32 and #34	14	X
Baizhu/Hedong Village/#4	13	X
Baizhu/Shixia Village/conversion site	about 30 ha for 2 sites	X
Baizhu/Sanankeng Village/forest plantation base set up by Forestry Bureau	467	
Baizhu/Beifeng Village/#63	9	X

JFDC Sino-Wood Panel facility	n/a	
Nursery	4.5	
Huilong/Liu Village/#77	26	X
Huilong/Gongrong Village/#2	14	X
Liantang #1, #2, #4, #5	53	
<b>TOTALS</b>	<b>168</b>	

#### 2.4. Standards

The SmartWood generic guidelines adapted for China were used for this assessment. Team member Zhu Chunquan is a member of the working group to adapt the generic guidelines to conditions in China, and he shared with the team some preliminary findings of that group. In nightly meetings the team discussed whether or not the generic guidelines should be adapted, and if so, how. The team concluded that, given the local social and environmental realities, FSC Principles 3 and 9 did not apply for this assessment.

#### 2.5. Stakeholder consultation process and results

The purpose of the stakeholder consultation strategy for this assessment was:

1. To ensure that the public was aware of and informed about the assessment process and its objectives.
2. To assist the field assessment team in identifying potential issues.
3. To provide diverse opportunities for the public to discuss and act upon the findings of the assessment.

This process is not just stakeholder notification, but wherever possible, detailed and meaningful stakeholder interaction. The process of stakeholder interaction does not stop after the field visits, or for that matter, after even a certification decision is made. SmartWood welcomes, at any time, comments on certification operations and such comments often provide a basis for field auditing.

In the case of JFDC, prior to the actual assessment process, 30-day advanced notice of the assessment was given to the stakeholders. A list of stakeholders is provided in Appendix 1. Meetings with the local communities were conducted in their villages and homes. Forest workers and contractors were interviewed on site and discussions with local government bureaus were held in their offices.

Three local villages were visited and numerous household and village leaders were interviewed.

#### Issues Identified Through Stakeholder Comments and Public Meetings

The stakeholder consultation activities were organized to give participants the opportunity to provide comments according to general categories of interest based upon the assessment criteria. The table below summarizes the issues identified by the assessment team with a brief discussion of each based upon specific interview and/or public meeting comments.

**Table 9: Stakeholder Comments**

FSC Principle	Stakeholder Comments	SmartWood Response
<b>P1: FSC Commitment/ Legal</b>	None.	Not necessary.

<b>Compliance</b>		
<b>P2: Tenure &amp; Use Rights &amp; Responsibilities</b>	None.	Not necessary.
<b>P3 – Indigenous Peoples’ Rights</b>	Not applicable.	Not applicable.
<b>P4: Community Relations &amp; Workers’ Rights</b>	No conflicts or complaints. Local farmers expect eucalyptus management will benefit them by more intensive management of underutilized land and providing occasional income.	Not necessary.
<b>P5: Benefits from the Forest</b>	Stakeholders expect changes will be positive, including more shade, better air, more birds, a better environment, a better road system, and increased income.	JFDC should monitor actual social impacts, environmental impacts, and perceptions of local residents.
<b>P6: Environmental Impact</b>	The local Forest Protection officer stated his belief that establishment of plantations has led to reduced levels of erosion.  The officer of hydrological bureau of Gao Yao Municipality is concerned about the over consumption of water of Eucalyptus plantation but does not have data to show the difference of water demands. Also there is no data on the water holding capacity of different forest types in the assessment area.	See P5.
<b>P7: Management Plan</b>	None.	Not necessary.
<b>P8: Monitoring &amp; Assessment</b>	None.	Not necessary.
<b>P9: Maintenance of High Conservation Value Forest</b>	N/A	Not applicable.
<b>P10 - Plantations</b>	None.	Not necessary.

### 3. RESULTS, CONCLUSIONS AND RECOMMENDATIONS

#### 3.1. General Discussion of Findings

**Table 10: Findings by FSC Principle**

<b>Principle/Subject Area</b>	<b>Strengths</b>	<b>Weaknesses</b>
<b>P1: FSC Commitment and Legal</b>	JFDC is committed to FSC forest certification. A special FSC working group was set up in JFDC and also in	While commitment to FSC Principles and criteria (P&C) is clear in reviewing planning documents, it is less clear when

<b>Compliance</b>	<p>Sino Forest Corporation in Hong Kong.</p> <p>JFDC has organized a forest protection team with local government in each town to stop illegal harvesting and other unauthorized activities.</p> <p>International, national and local conventions, laws and regulations on environmental issues have been collected by JFDC.</p>	<p>reviewing on-the-ground activities. This in part is due to the fact the company is newly established and has not yet had time to fully implement its plans.</p> <p>There is no track record of taxes and fees paid to the state because harvesting has only recently started on JFDC forestland.</p> <p>There appears to be a potential conflict of interest between the Forestry Bureau's approval of harvesting volumes and receipt of tax revenues associated with harvesting.</p> <p>There are some international laws and regulations available to staff, but they have not been translated into Chinese so that staff can better understand and implement them.</p>
<b>P2: Tenure &amp; Use Rights &amp; Responsibilities</b>	<p>Long-term rights to use the land are as clear and secure as they can be under the existing system.</p> <p>Mechanisms to resolve disputes exist.</p>	<p>JFDC needs to demonstrate how they will deliver the promised payment of 30% of the timber harvested to the target group of farmers.</p> <p>Agreements are only for 50-year periods and cover only land-use rights; ownership of the land remains with the government.</p>
<b>P3 – Indigenous Peoples' Rights</b>	Not applicable.	Not applicable.
<b>P4: Community Relations &amp; Workers' Rights</b>	JFDC landowners and workers have their own organizations and mechanism to deal with grievances and conflicts.	<p>JFDC should develop a better understanding of local farmers' income sources and try its best to involve the farmers in the forest management.</p> <p>Evaluations of social impact are weak in both management planning and operation.</p>
<b>P5: Benefits from the Forest</b>	<p>JFDC optimizes use of forest products and minimizes waste.</p> <p>Low-impact harvesting and on-site processing minimize damage to forest resources.</p> <p>JFDC received a prestigious award as a leading company from the Forestry Department of Guangdong Province in 2001 for its outstanding performance as a model in integrating tree planting, plantation management, timber production and processing to contribute to the social economic development of local</p>	<p>Growth and yield data is not yet sufficient to document sustained yield.</p> <p>Timber production relies on a single exotic species, eucalyptus, with small proportion of acacia.</p> <p>NTFPs are not considered by JFDC. JFDC management lower farmers' ability to harvest resin due to the conversion of the pine plantations to Eucalyptus plantations.</p> <p>JFDC should strengthen efforts to</p>

	<p>communities and government.</p>	<p>improve non-timber values of the forest, such as watershed protection, fishing, animal husbandry and erosion control.</p> <p>Fluctuating timber prices may impact JFDC's ability to implement management plans and to make necessary investments.</p> <p><b>Precondition 1 – Weakness addressed, see precondition summary below.</b></p>
<p><b>P6: Environmental Impact</b></p>	<p>A limited environmental impact assessment is carried out by JFDC</p> <p>JFDC put environmental benefits into their written management objectives.</p> <p>JFDC selects species that allow them to minimize the use of chemical pesticides.</p>	<p>There is little evidence to show the connection of the environmental impact assessment with specific management operations in the fields.</p> <p>There is no landscape level planning and environmental impact assessment for JFDC's operations. No data or maps show the distribution patterns of ecological services forests (designated by the national government, and off-limits to harvesting), protected areas (the assessment team was unable to get any official documents about the protected areas), fishing and animal husbandry ponds, reservoirs, agricultural lands and human settlement and their managed plantations.</p> <p>The conversion of Masson pine plantation to eucalyptus plantation raises some concern about ecological diversity.</p> <p>There is no list of rare and endangered species of wild fauna and flora in the Forest Bureau of Gao Yao Municipality.</p> <p>JFDC staff don't have a good understanding of which species in their managed areas are protected and are not able to readily identify them.</p> <p>Chemical fertilizers are used for the first three years of new established Eucalyptus plantations, which may affect water quality of downstream fish ponds and reservoirs.</p> <p><b>Precondition 2 - Weakness addressed,</b></p>

		<p>see precondition summary below.  <b>Precondition 3 - Weakness addressed, see precondition summary below.</b>  <b>Precondition 4 - Weakness addressed, see precondition summary below.</b></p>
<b>P7: Management Plan</b>	<p>JFDC appears to be following all applicable laws.</p> <p>JFDC does have written management plans for harvesting, roads, and a long-term plan.</p> <p>Staff is given training to ensure proper implementation of the plans.</p>	<p>Plans do not provide the level of detail needed to be implemented effectively.</p> <p>Critical management issues are not identified.</p> <p>Plantation layout and design, particularly for buffer areas, corridors, and set-asides (whereby forest restoration could take place) are not addressed.</p> <p>Well-articulated and clearly defined goals of management are limited to timber production.</p> <p>There is no landscape-level planning. Tools such as GIS or Forest Information Systems, that would spatially organize the plantation data, have not become operational.</p> <p>Staff needs additional training, that includes site-specific information and measures, to ensure the plans are implemented effectively.</p> <p><b>Precondition 5 - Weakness addressed, see precondition summary below.</b></p>
<b>P8: Monitoring &amp; Assessment</b>	<p>Plans have been developed to monitor key resources.</p>	<p>Planning does not identify critical issues. Planning does not address how monitoring data will be used in assessment and in revising management strategies.</p>
<b>P9: Maintenance of High Conservation Value Forest</b>	<p>Not applicable.</p>	<p>Not applicable.</p>
<b>P10 - Plantations</b>	<p>Local communities believe JFDC's plantation management will be beneficial to them in terms of income, reduction of soil erosion, better roads, etc.</p> <p>JFDC supports studies to identify native species suitable for planting.</p>	<p>There is over-reliance on exotic species that may have long-term adverse impacts on soil and water.</p> <p>Non-timber management objectives are not well articulated or demonstrated.</p>

	JFDC does an excellent job of monitoring for mortality, disease, and fire.	<p>Corridors and conservation areas have not been established. Plantation management is simplifying the landscape, creating only early seral stage forests of exotics.</p> <p>The rationale for plantation establishment using exotic species to replace planted pines (native) has not been adequately addressed. There may be possible impacts on long-term soil quality, water quality, and native species.</p> <p><b>Precondition 6 - Weakness addressed, see precondition summary below.</b></p>
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### 3.1.1 Precondition Compliance

**Precondition 1:** Prior to certification, JFDC shall clearly demonstrate the calculation for sustained yield on the forest plantation area under assessment for certification, using either area or volume control.

JFDC will calculate their AAC primarily by area control, although standing volume and growth is also considered. Area control for calculating sustained yield will be based on harvesting stands on a 6-year rotation for eucalyptus and 8 years for acacia. However, age classes in Huilong and Baizhu are not currently distributed evenly, therefore it will take a couple of years to regulate the age class distribution. Plantation stands will be eligible for harvest between the ages of 5 and 7 until the age class distribution is regulated. Over-mature, World Bank project plantations (791.01 ha) in Huilong (8~11 years old) will be liquidated by the end of this harvest year.

Huilong and Baizhu plantation areas are now fixed, meaning that they will not expand beyond the current hectareage in the future. The current age class distribution is described in table 1. Age class 4 and 3 are out of proportion to the rest of the age classes. They will be the primary targets of the 5-7 year harvest schedule that will allow JFDC to even out the distribution of age classes. The ultimate goal is to harvest areas that are equal or close to the cumulative average age of 6 years (given that some areas are acacia and that market conditions will fluctuate over time) and produce a more even flow of wood. The area harvested will be around 873 hectares annually, that is 5,237.1 hectares divided by 6 when age classes are regulated.

Table 1. Age Class Distribution in Huilong and Baizhu.

Age (year)*	6~12	7	6	5	4	3	2	1	Total area
By the end of 2002	791.01 (8~11)	0.00	133.59	647.85	518.98	1,327.19	1,178.23	640.25	5,237.10
By the end of 2003	0 (9~12)	133.59	647.85	518.98	1,327.19	1,178.23	640.25	791.01	5,237.10

\*The harvested year is counted as 1-year old coppiced plantations.

At the time of the precondition audit, the company stated that over the entire area of JFDC plantations, the basic annual cut will fluctuate until the expansion to 33,333.33 hectares is completed in 2006. In 2002 the

harvest was 123, 377.8 m<sup>3</sup> while growth for 2002 was 160,465 m<sup>3</sup>. Again, that volume came from primarily the over mature stands. JFDC's planted stands, those planted beginning in 1997, have relatively uniform growth and yield, however, growth and yield may improve as better stock is developed and planted. Given the expansion of area, liquidation of over mature plantations and improvement in growing stock, JFDC will need to annually update their sustained yield calculations as per Condition 10.

The audit team accepts the JFDC's calculation and system for justifying their sustained yield. However, although stands (sub-compartments) are relatively small (most <20 hectares) and coppiced plantations sprout to over 30% canopy cover within three months, stands of the same age can be aggregated geographically giving the auditors some concern about impacts from concentrated harvests. There are potential negative impacts to soil, wildlife, water quality, agriculture, etc. The assessment team also voiced this concern in criterion 10.2 and condition 23 of the assessment report. The audit team is encouraged, however, that JFDC's stated objective is to balance market demand, weather considerations, compartment area harvested and relevant communities' requests, in an effort to minimize the negative impacts. How that objective is manifested in the field will be of interest of future auditors given the conditions to be met in the first year of certification.

The auditors found that this precondition was closed.

**Precondition 2:** Prior to certification, JFDC shall provide ecological and silvicultural justification for current species selection. Demonstrate that local trials and research show that eucalyptus are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems.

There is a large amount of information on eucalyptus plantings worldwide. It is common plantation species in tropical and sub-tropical countries used primarily for paper pulp, particleboard and medium density fiberboard. For eucalyptus plantations in Gaoyao and other parts of South China, JFDC has cited a number of scientific publications that refer to a long-term history of successful introduction and cultivation of eucalyptus species. *Eucalyptus urophylla*, and its hybrid with *E. grandis*, the two species found and used in the JFDC plantations, have been grown in the area over the last two decades (as stated above, the World Bank planted eucalyptus in the early 1990's). According to research cited by JFDC, *Eucalyptus urophylla* and its hybrid with *E. grandis* have the best potential for short-rotation plantation development in Gaoyao and surrounding regions. It is fast growing, disease and pest resistant, well adaptive to historically deforested and degraded lands, has low nutrient demand, is not invasive, has not crossed to any native species, has no naturally regeneration ability (outside of coppicing), and has some positive effects on the environment by increasing forest cover. *Acacia magium* has also been researched as a plantation species, with no ill effects as yet determined. However, it appears that JFDC will concentrate on the eucalyptus species

JFDC made a further important point that the maximum proportion of short-rotation eucalyptus plantation, given the current land-use designation of commercial forest by the government in Gaoyao, would not be higher than 26.2% of the total forested area. After JFDC's expansion plan is completed, its short-rotation plantation will only account for 18.9% of Gaoyao forests. At present, 55.8% of lands are legally designated as forestland. "Ecological service" or "non-commercial" forests make up 30.6% of the 55.8%. Commercial forest comprises 69.4% percent of the 55.8% or only 26.2% of the forested area is designated for short rotation plantations. The right to use the forestlands have to be negotiated with local farmers and communities. Some farmers and communities have not agreed to participate in the plantation scheme, therefore some areas designated for short rotation plantation will in fact not be planted. Additionally, the plantations will be dispersed on landscape given the multi-use and user right patterns.

The field audit confirmed that the plantations do not dominate the landscape (Although age class distribution and potential harvest impact in specific sites concerned the auditors. See discussion in the findings for precondition 1 above). Maps of JFDC plantations also corroborated that the plantation are dispersed across the landscape. It appears that the plantations would be adding to the diversity of vegetation and habitat of the region rather than simplifying it. Native understory vegetation is allowed to grow in the plantations, herbicides are not used, creating some diversity within the “mono-crop” stands of eucalyptus or acacia. Eucalyptus has less foliage than acacia allowing more light to the forest floor, which encourages understory vegetation to grow. Additionally, the auditors observed the eucalyptus plantations established by the World Bank and saw no evidence that the eucalyptus were spreading outside of the plantation areas. The areas of eucalyptus and acacia planted by JFDC appear vigorous.

JFDC made interesting observations about future challenges and issues that may impact plantation management, socioeconomics or the environment in Gaoyao and surrounding areas. They mentioned that any number of factors could change national/local forest policy on forestland classification or change the company’s (and other private plantation investment companies) commitment to the plantation management. These changes could lead to either expanding or contracting the plantation areas. Both scenarios would have impacts on the community and environment. Issues that could have an impact on decision making: 1) Continuous intensive plantation management may cause the reduction of site productivity; 2) Other ecosystem types may out perform the short rotation eucalyptus in conserving water and soil and therefore be more desirable; 5) an increase in the local standard of living will increase the local people’s interest in conservation over timber production; 6) the simplified forest ecosystem may be more susceptible to forest fire and other natural problems and last, but certainly not the least; 7) future market conditions could make the plantation very desirable or undesirable.

The auditors found that this precondition was closed.

**Precondition 3:** Prior to certification, JFDC, will develop a plan or strategy to establish set-aside areas with the cooperation of local government, whereby the set asides shall be off-limits to all commercial harvesting unless such harvesting can be demonstrated to enhance the conservation values. JFDC will not be required to hold land-use rights for set-asides, but to demonstrate that land-use rights are secure and that the area will remain in set-aside for the long-term (generally accepted as being a minimum of 50 years). Within the certified area, JFDC shall determine the size, location and configuration of set-asides, river and gully buffers or corridors for natural vegetation restoration. If established off lands managed by JFDC, the size, location and configuration shall be determined by negotiation between JFDC and the individuals, groups, agencies, or other entities involved in the establishment and management of such set-asides.

The Chinese government sets the policy for land-use classifications in Guangdong. For forestry there are two basic classifications; commercial and ecological service forests (ESF). The ESF areas are set aside for protecting aspects of the local environment such as water quality, slope stability, soils, etc. There is some active management in the ESFs, but it is aimed at maintaining or enhancing the forest so that it can continue to provide an “ecological service”. The designated minimum rotation ages of ecological service forests in Guangdong, Province is more than 40 years for pine forests, and more than 50 years for broadleaf and mixed-species forests. Harvesting and thinning are approved only for regeneration and the improvement of stands. Regeneration is conducted only when 30% of trees start to naturally die. Clearcutting is prohibited, and thinning should not lead to less than 70% crown closure.

The County Forest Bureau or Township Forest Station manages the ESFs. Private companies like JFDC are not allowed to manage ESFs. JFDC has signed an agreement with the township forest stations of Baizhu and Huilong to provide assistance, free of charge, for the protection and maintenance of 697.6 hectares of ESFs. The auditors were provided with a copy of the agreement and shown the areas on a map.

Baizhu's ESFs are in three villages comprising 5 compartments and 12 subcompartments, totaling 124.3 hectares. Huilong's are also in three villages comprising 5 compartments and 27 subcompartments, totaling 573.3 hectares. These areas are included in the JFDC management plan, are mapped and cross-referenced in the JFDC FSC progress report that was provided to the SmartWood auditors. The 697.6 hectares represents 13.3% of their plantation area.

JFDC will provide forest protection, seed/seedlings, technical assistance and cooperate with local research institutions to develop efficient methods for better management of ecological service forests. JFDC's immediate goal in cooperatively managing these ESF areas is to make sure that they perform their intended function equally or better than other ESFs in the region. Long-term goals include contributing to local ecological, biological and environmental conservation, and minimizing the potential negative impacts caused by the development of the plantations.

Although the auditors did not interview the local community or the government officials in charge of ESF management, it appears that the local agencies will request help from JFDC for managing some aspect of the ESFs. Then the parameters of the project will be negotiated and an action plan will be developed. Currently, JFDC's forest protection crews are carrying out regular forest protection duties within the ESFs. The forest protection staff patrols the ESFs for fire and illegal logging prevention, and to report potential pest/disease problems within the forests. The protection staff is comprised of local people who come from the two townships.

Set-aside areas on the commercial forest are difficult to put in place. The local farmers are paid by JFDC for the lease of the land use rights through a percentage of the harvest (30% in this case). Setting aside lands on these commercial forests would mean reduced payments to the farmers since a set-aside would mean reduced harvesting area. The designation of ecological service forests means that part of the farmers' land is already set aside. The farmers do get compensation for ESFs, but at a reduced rate. Therefore, it will be extremely difficult to persuade the farmers (cooperative partners) to convert part of commercial forestlands into set-aside areas for conservation purposes. The most logical and possible areas on the commercial forest that could (and in some cases should) become set-asides are ecological sensitive areas (ESA). ESAs have been defined as stream/lake buffer zones, steep slopes (>25 degrees), unstable slopes, high potential for erosion, etc. However, ESA designation does not necessarily mean no harvesting. The designation of ESAs is a relatively new concept and JFDC is still in the process of deciding what management techniques would serve the purpose of protecting these areas. For example, JFDC is considering not creating future plantations on any area (land) that averages 25 degrees or greater in slope. Within stands with the average slope below 25 degrees, areas over 25 degrees and greater than 1000m<sup>2</sup> will be treated as ESA. They are also considering harvest timing and/or thinning only in water resources buffer zones.

Given the findings above and the continued attention to these issues in condition 15, 18 and 23, this precondition can be closed.

**Precondition 4:** Prior to certification, JFDC shall provide a table listing all chemicals used by JFDC's certified operations, including application rate, for review by SmartWood.

An updated list (in English and Chinese) of chemicals used by JFDC was presented in the appendix of their progress report. The list includes the common and scientific names, classification, general application rate, usage and toxicity/safety information. None of the chemicals used are on the WHO type 1A or 1B list. The list was also distributed to the relevant staff in Gaoyao for their edification. They have also made available Material Safety Data Sheets (MSDS) for each chemical to their staff. The MSDS contains guidelines for applying the chemical. Copies of MSDS are part of the JFDC progress report appendices.

JFDC only minimally uses pesticides (generic term that includes all herbicides, insecticides, fungicides, rodenticides, etc.). They use some fungicides in their nursery only. Herbicides, insecticides or fungicides are not used in the plantations. Chemical fertilizers (N,P,K) are used in the plantations. The fertilizer is hand applied around each tree. The fertilizers used in the nursery and plantations are common compound fertilizers similar to those applied in agricultural lands.

It is in JFDC's best interest to pay close attention to the fungi, insects and diseases that may cause damage to the eucalyptus plantations. They will continue their effort to manage the nursery and plantation to prevent and control pests and disease without creating environmental problems. However, when the need for pesticides arises, JFDC will assure that the local, national and international regulations and FSC's Chemical Pesticides in Certified Forests - Interpretation of the FSC Principles & Criteria (FSC 2002) will completely be followed.

The auditors found that this precondition was closed.

**Precondition 5:** Prior to certification, JFDC shall revise the current management plan (or add supplementary information) to provide clear data for the areas under assessment for certification, i.e., Baizhu and Huilong.

JFDC presented the auditors with a summary of the revised management plan, the "JFDC Forest Plantation Management Plan". A specific management section (14) was added to the overall management plan to include just the Huilong and Baizhu plantations. In addition, JFDC included the area control, annual allowable cut calculation (see findings of precondition 1) and a clarification of the total plantation hectareage of the Huilong and Baizhu area.

Other improvements to the management plan were evident. The plan included short, medium and long-term goals and measures to achieve those goals. Significant additions included 1) "Codes for Short Rotation Tree Plantation Management Planning", a document to guide plantation establishment. The document included Overall Planning and Design, Seedling Culture Operation, Silvicultural Operation, Stand Tending and Management, Forest Protection, Harvesting Operation, Regeneration, Conservation of Ecological Environment and Biodiversity and Inspection, Research and Information Management; 2) "Operation Procedure for Ecological Sensitive Areas (ESAs)" that includes the Goals, Criteria and Scope, Operation Guidelines, and Monitoring, Feedback and Adjustment.

The auditors found that this precondition was closed.

**Precondition 6:** Prior to certification, JFDC shall make available the written guidelines for operations on steep slopes. An English translation of the main points shall be included.

JFDC has developed written guidelines for operations on steep slopes. They have included those guidelines in their "Operation Procedures for Ecological Sensitive Areas (see description in the discussion above in Precondition 5). An English version of these procedures was attached to the JFDC progress report. The procedures include the classification of forest lands according to slope: a) average slope  $\leq 15^\circ$  are ideal lands for forest plantation development, b) average slope between  $15^\circ$  and  $25^\circ$  are acceptable

lands for forest plantation development, c) average slope >25° are not suitable for forest plantation development unless clear evidence supports otherwise. Steep slopes will be identified on sub-compartment maps and a plan is developed for monitoring the impacts of steep slope management on environmental conditions, particularly water quality and soil erosion.

The primary emphasis on the steep slope guidelines will be that JFDC will fully accept SmartWood's recommendation that "no new plantations shall be established on slopes over 25 degrees or ESAs until the company has sufficient evidence from monitoring that management activities, including harvesting (on existing plantations on slopes over 25 degrees), are not having an adverse impact on these areas". According to JFDC's new procedure, newly expanded plantations will be restricted to sites with slopes less than 25 degrees. For small plots, 1000m<sup>2</sup> or larger, within the plantation site with slopes over 25 degrees, the native vegetation may be kept or trees may be planted, depending on topography and soil condition. Harvesting on these areas will be strictly controlled.

Operational guidelines for the existing steep slopes include options such as: 1) minimum vegetation and soil disturbance; 2) planting and harvesting trees in seasons that do not cause soil or water erosion, 3) increasing planting density; 4) maintaining the under-story vegetation during and after operation, 5) manually harvesting trees and carrying logs to the collection points; 6) harvesting when areas adjacent to steep slopes within the stand have recovered from harvesting and; 7) converting to non-commercial species.

The auditors found that this precondition was closed.

### **3.2. Certification Decision**

Based on a thorough field review, analysis and compilation of findings by the original SmartWood assessment team, JFDC was not recommended, at that time, to receive joint FSC/SmartWood Forest Management and Chain of Custody (FM/COC) Certification. The certification of the company was contingent upon successful completion (and closing out) of the preconditions listed below.

Based on a field review, analysis, and findings from a SmartWood precondition audit team, JFDC was found to have complied with and closed out the pre-existing preconditions. At this date, December 18, 2003, JFDC is recommended to receive joint FSC/SmartWood Forest Management and Chain of Custody (FM/COC) Certification.

In order to maintain certification, JFDC will be audited annually on-site and required to remain in compliance with the FSC principles and criteria as further defined by regional guidelines developed by SmartWood or the FSC. JFDC will also be required to fulfill the conditions as described below. Experts from SmartWood will review continued forest management performance and compliance with the conditions described in this report, annually during scheduled and random audits.

### **3.3. Preconditions, Conditions and Recommendations**

Preconditions are mandatory actions that must be completed prior to a certification being granted. Company compliance with these preconditions must be verified through document review and possibly an on-site audit. Conditions are verifiable actions that will form part of the certification agreement that JFDC will be expected to fulfill at the time of the first audit or as required in the condition. Each condition has an explicit time period for completion. Noncompliance with conditions will lead to de-certification.

### **Preconditions from original assessment**

**Precondition 1:** Prior to certification, JFDC shall clearly demonstrate the calculation for sustained yield on the forest plantation area under assessment for certification, using either area or volume control.

**Precondition 2:** Prior to certification, JFDC shall provide ecological and silvicultural justification for current species selection. Demonstrate that local trials and research show that eucalyptus are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems.

**Precondition 3:** Prior to certification, JFDC, will develop a plan or strategy to establish set-aside areas with the cooperation of local government, whereby the set asides shall be off-limits to all commercial harvesting unless such harvesting can be demonstrated to enhance the conservation values. JFDC will not be required to hold land-use rights for set-asides, but to demonstrate that land-use rights are secure and that the area will remain in set-aside for the long-term (generally accepted as being a minimum of 50 years). Within the certified area, JFDC shall determine the size, location and configuration of set-asides, river and gully buffers or corridors for natural vegetation restoration. If established off lands managed by JFDC, the size, location and configuration shall be determined by negotiation between JFDC and the individuals, groups, agencies, or other entities involved in the establishment and management of such set-asides.

**Precondition 4:** Prior to certification, JFDC shall provide a table listing all chemicals used by JFDC's certified operations, including application rate, for review by SmartWood.

**Precondition 5:** Prior to certification, JFDC shall revise the current management plan (or add supplementary information) to provide clear data for the areas under assessment for certification, i.e., Baizhu and Huilong.

**Precondition 6:** Prior to certification, JFDC shall make available the written guidelines for operations on steep slopes. An English translation of the main points shall be included.

### **Final Conditions**

**Condition 1:** By the end of the first year of certification, a summary of the key articles of the international laws and regulations maintained by Sino Forest shall be translated into Chinese and distributed to staff. (Criterion 1.3)

**Condition 2:** By the end of the first year of certification, JFDC shall develop a thorough list of the primary social impacts from its harvesting operations and implement a systematic process to consult with affected landholders prior to new operations that incorporates the findings from such consultation in future planning. (Criterion 4.4)

**Condition 3:** By the end of the first year of certification, JFDC shall have in place sufficient mechanisms that can confirm and monitor that villagers receive their contractually agreed share of the harvest. (Criterion 4.5)

**Condition 4:** During the period of certification, evaluated at each annual audit, JFDC will demonstrate company efforts made to investigate and/or promote commercial or subsistence NTFP harvesting from the plantations. (Criterion 5.4)

**Condition 5:** By the end of the first year of certification, JFDC will have available initial results from soil and water quality monitoring. These will include monitoring of soil erosion and water quality during and after harvesting, with special attention paid to slopes over 25 degrees, ESAs, and areas where new roads have been constructed. No new plantations shall be established on slopes over 25 degrees or in ESAs until the company has sufficient evidence from monitoring that management activities, including harvesting (on existing plantations on slopes over 25 degrees), are not having an adverse impact on these areas. Analysis of monitoring data will be made available at each subsequent annual audit. (Criterion 5.4)

**Condition 6:** By the end of the first year of certification, JFDC will make available to the auditor information that documents efforts to identify and contact recreation and fisheries collectives or groups, inviting them to assist in the collection of qualitative and quantitative data on impacts on fisheries, wildlife, recreation, etc. (Criterion 5.4)

**Condition 7:** By the end of the first year of certification, JFDC shall limit construction of new roads as much as possible to the dry period (October through March) only, and the Management Plan and the Roads Plan will be revised to reflect these changes. (Criterion 5.4)

**Condition 8:** By the end of the first year of certification, JFDC will develop a strategy for monitoring the impact of plantations on water availability. By the end of the second year of certification, a monitoring system will be in place. By the end of the third year of certification and each year thereafter, monitoring results will be made available to the auditors. (Criterion 5.4)

**Condition 9:** By the end of the first six months of certification, JFDC will compile a list of listed fish species present in the XiZang River and its tributaries that may receive sediment from company-managed lands.(Criterion 5.4)

**Condition 10:** During the period of certification, JFDC shall annually update documentation that clearly demonstrates the sustained yield of the plantations. (Criterion 5.6)

**Condition 11:** By the end of the second year of certification, JFDC shall produce maps that identify adjacent forests (including type, owner and contact information), water bodies (large ponds, reservoirs, all perennial watercourses, seasonal watercourses, wet areas, and springs), protected areas (including manager and purpose), and agricultural lands. (Criterion 6.1)

**Condition 12:** By the end of the first year of certification, JFDC shall develop and implement a protocol for conducting impact assessments of sites prior to substantial operations, such as site selection for plantation expansion, harvesting, site preparation, road construction, planting and stand tending. (Criterion 6.1)

**Condition 13:** By the end of the first year of certification, a system will be developed for actively identifying, listing, and/or protecting RTE species and their habitats that potentially occur on JFDC managed property. (Criterion 6.2)

**Condition 14:** By the end of the second year of certification, JFDC will have trained key field personnel in RTE species identification and the company measures to protect these species. (Criterion 6.2)

**Condition 15:** By the end of the first year of certification, guidelines for management of Ecologically Sensitive Areas will be developed. (Criterion 6.2)

**Condition 16:** During the period of certification, JFDC shall annually provide to the auditor a summary of the size, location, function, and management (including extent of JFDC involvement) of any set-asides and include maps showing their location. Prior to converting any pine plantations or other lands to plantations, JFDC shall indicate whether or not there are set-asides that contain representative examples of the area being converted. (Criterion 6.4)

**Condition 17:** By the end of the first year of certification, JFDC shall write technical guidelines and implement specific measures to minimize impacts from harvesting, road construction, and all other mechanical disturbances to control erosion and protect water resources. (Criterion 6.5)

**Condition 18:** By the end of the first year of the certification, JFDC shall incorporate into its planning documents the following information:

1. Identification of critical issues, or important management concerns, other than timber production, as well as short-term and long-term goals and objectives for non-timber issues.
2. basic forest types and land uses in the region (landscape level), including at a minimum cover type/land use with brief explanations, estimates of % cover, including set-aside areas and protected areas;
3. basic forest types and land uses on JFDC managed properties (forest-level), including cover type/land use, estimates of % cover, including set-aside areas and Ecologically Sensitive Areas;
4. provide the rationale for the planned future establishment of large areas of plantation, explaining how such conversion provides a clear and long-term conservation benefit at the landscape level. Any mid-seral habitat should be identified and considered for set-aside.
5. land (including water) or vegetative characteristics, human uses, etc. that are indicators of areas of important conservation value (particularly when assessing lands for conversion to new plantations), and a process to follow when such areas are identified;
6. specific information on the designation and width of buffer zones around unstable areas, areas with active erosion, springs, wet areas, watercourses;
7. a plan for monitoring soil erosion that, at a minimum, specifically addresses (1) monitoring soil erosion on sites where sediment may be transported to a perennial or seasonal watercourse, including the location of stations, parameters to be monitoring, frequency and timing of data collection and analysis and (2) evaluation of erosion hazard and rates on hillslopes with versus without plantations on slopes over 25°; for monitoring plans that assess on- and off-site environmental impacts (including water quality), identify baseline data to collect on soils, guidance to field personnel about estimating the hazard of soil erosion and what to do in areas of extreme erosion hazard;
8. include how monitoring will be done to assess negative ecological impacts from exotic species, paying special attention to the alleopathic effects of eucalyptus;

**Condition 19:** At each annual audit, JFDC shall make available to the auditor the revised management plan and other revised plans each year providing examples of how information collected was incorporated into the revision of planning documents. (Criterion 7.2)

**Condition 20:** During the period of certification, JFDC shall continue to provide periodic trainings for staff and contractors. The content and frequency of this training must be adjusted to reflect changes in the management plan and as related to certification conditions. (Criterion 7.3)

**Condition 21:** Prior to harvest or within six months of certification, JFDC shall develop a method for clearly indicating on trip tickets that harvested logs originate from certified forest operations. (Criterion 8.3)

**Condition 22:** By the end of the first year of certification, JFDC shall have a summary of the primary elements of the revised management plan and a summary of the results of monitoring available and will provide it, upon request, to anyone who should ask for a copy. (Criterion 8.5)

**Condition 23:** By the end of the first year of certification, ESAs shall more fully describe characteristics of watercourses and waterbodies that will be protected and describe any no-cut buffer zones. The management plan shall explicitly state the maximum size of clearcut units and adjacency requirements (Criteria 10.1)

**Condition 24:** By the end of the first year of certification, JFDC should compile a list of native species they are considering for plantation establishment and set-aside management. By the end of the second year and on an ongoing basis, JFDC will continue and expand research and development of native species for plantation establishment and/or to include within plantations of exotics. (Criterion 10.4)

**Condition 25:** By the end of the first year of certification, new planting (including re-plantings) in ESAs shall be limited to native species unless a reasonable and persuasive argument can be made in terms of ecological, economic, and social benefits for the planting of exotics. (Criterion 10.5)

**Condition 26:** By the end of the first year of certification, written guidelines for road construction, road maintenance, and site preparation shall specify that no fill or waste material will be placed in watercourses. (Criterion 10.6)

**Condition 27:** During the period of regulating age class distribution in Huilong and Baizhu, disperse the harvest so that adjacent areas, approximately equal to the harvested area in size, is harvested in subsequent year.

### **Recommendations**

Numerous nonbinding recommendations were generated in order to address suggested improvements.

## **SmartWood Certification Annual Addendum to the Public Summary for Sino-Forest Corporation/Gaoyao City Jaiyao Forestry Development Company, Limited, 2005; SW-FM/COC-1146**

### **1. AUDIT PROCESS**

#### **1.1 Auditors and qualifications:**

**Walter Smith, Team leader, Forest Management Practices.** Walter is Senior Technical Specialist for the Rainforest Alliance SmartWood certification program. Walter has 17 years experience in logging, training and forest resource management and 13 years experience in Forest Stewardship Council (FSC) forest management and chain of custody certification. He is a founding member of the FSC and was on the original FSC Principles and Criteria Working Group. Walter began working with

SmartWood in 1995. Since then he has been a team leader on over 120 forest management and chain of custody assessments and audits in Canada, China, India, Indonesia, Nepal, Japan, Malaysia, Philippines, Singapore, Vietnam and all regions of the United States. He is a principal instructor for the SmartWood Assessor Training Program and has participated in 22 training workshops in North America and Asia and is the co-author of a book on certification with ecologist Chris Maser.

**Xu Bin, Forestry.** Xu is the Deputy Division Director and Associate professor at the Information Research Division, Research Institute of Forestry Information and Policy, Chinese Academy of Forestry in Beijing. He has 11 years' experience in forestry research, with a focus on Sustainable Forest Management and Forest Certification, forest product marketing, and forest policy. As the deputy director of the research team on forest certification, he has supervised more than 10 relevant research projects on standards setting, capacity building, Working Group, promotional activities with regards to certification. Xu was the first master's degree candidate in China to do his thesis on certification and since that time has worked as the contact person for the Chinese Working Group on Forest Certification, coordinator and principal author of the National Forest Certification Standards and FSC Regional Standards for Northeast China. Xu has taken part in several FSC auditor trainings and has participated as an observer on an FSC pre-assessment and assessment in Northeast China.

## 1.2 Audit schedule

Date	Location /main sites	Main activities
January 22, 2005	JFDC office	<ul style="list-style-type: none"> <li>Review documents</li> <li>Discuss conditions</li> </ul>
January 23, 2005	Huilong Town Forests	<ul style="list-style-type: none"> <li>Review current/recent harvesting</li> <li>Review plantation tending activities</li> <li>Stakeholder Interview</li> <li>Review ecological service forest and ecological garden sites</li> <li>Review road construction and monitoring</li> </ul>
January 24, 2005	Baizhu Town Forests	<ul style="list-style-type: none"> <li>Review current/recent harvesting</li> <li>Review plantation tending activities</li> <li>Stakeholder Interview</li> <li>Review ecologically sensitive areas</li> <li>Review road construction and monitoring</li> <li>Review research plots</li> </ul>
January 26, 2005	Sino-Forest Office	<ul style="list-style-type: none"> <li>Review preliminary results of the audit</li> </ul> Clarify information provided for compliance
Total number of person days used for the audit: <b>5.5</b>		

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### 1.3 Sampling methodology:

JFDC has two certified forest management units (FMU) in their Gaoyao operation: Huilong and Baizhu. Within these two FMUs the auditors selected sites that represented the spectrum of plantation management activities and social and environmental issues needed for a thorough evaluation of compliance with the FSC P&C as well as compliance with the conditions of the certification. The auditors pre-selected most of the audit sites at the JFDC office by reviewing plantation management information and pinpointing the sites on maps. However, several sites were randomly chosen for review while traveling through the FMU's.

FMU or Site audited	Rationale for selection
JFDC Office	To review records, documents, maps and plans are stored at the JFDC office.
Huilong	1. To review plantation management elements including: <ul style="list-style-type: none"> <li>• harvesting,</li> <li>• silviculture,</li> <li>• road construction,</li> <li>• tending,</li> <li>• monitoring,</li> </ul> 2. To review: <ul style="list-style-type: none"> <li>• ecological garden (owned by the government/private enterprise),</li> <li>• ecological service forests (owned by the government) and,</li> <li>• ecologically sensitive areas (owned by JFDC),</li> </ul> 3. To review stakeholder input, and village benefits.
Baizhu	1. To review plantation management elements including: <ul style="list-style-type: none"> <li>• harvesting,</li> <li>• silviculture,</li> <li>• road construction,</li> <li>• tending,</li> <li>• research plots.</li> </ul> 2. To review ecologically sensitive areas 3. To review: stakeholder input and village benefits.

### 1.4 Stakeholder consultation process

The stakeholder consultation process was done at the grass roots level by random and unannounced meetings with people in the field. The auditors talked with several people tending their farm plots and two village representatives (including the village head) while traveling through the two certified townships. We talked with them about the effects from the plantation management and whether the financial rewards from the plantations were fair and timely. Unfortunately, Chinese New Year was coming up and the plantation workers had gone home for the holiday.

Stakeholder type	Number of	Number of
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(NGO, government, local inhabitant etc.)	stakeholders informed	stakeholders consulted or providing input
Government		2
Village Representatives		2
Local Farmers		2
Eco Garden Neighbor		1

### 1.5 Changes to Standards (if applicable)

No changes in the standards since the last assessment/audit

## 2. AUDIT FINDINGS AND RESULTS

### 2.1 Changes in the forest management of the FMO

Changes to the forest management of Jiayao Forest Development Company (JFDC) would be reflected in the findings of their compliance with the minor Corrective Action Requests (CARs, i.e. *conditions*) listed below in 2.3. In other words the changes in JFDC management are improvements that they have made toward fully complying with the FSC Principles and Criteria.

JFDC provided to the auditors the newest version of their management plan and both their 2003 and 2004 progress reports that provide evidence of their compliance with the CARs. Those reports and appendices are appended to the confidential section of this report.

### 2.2 Stakeholder issues

Local village representatives stated that they received timely and accurate compensation from the forestry bureau for the timber harvested by JFDC. The village collects the funds and then has a meeting of village representatives to decide how to disburse the funds. Each village has one representative for about every four or five families. The village visited during the audit, Chentsu, had 50 representatives, elected by secret ballot for a three-year term, for a population of 2800 people.

Local inhabitants are also allowed to get fuelwood from pre-harvest fallen branches and from non-usable parts of the trees post-harvest. This collection and disbursement of fuelwood among a wide number of households was clearly evident by the stacks of eucalyptus branches seen in several local villages that were nearby the plantations.

### 2.3 Compliance with applicable corrective actions

The section below describes the activities of the certificate holder to address each applicable corrective action request (CAR) issued during previous evaluations. For each CAR a finding is presented along with a description of its current status using the following categories. Failure to meet CARs will result in noncompliances being upgraded from minor to major noncompliances with compliance required within 3 months or face suspension or termination of

the SmartWood certificate. The following classification is used to indicate the status of the CAR:

CAR Status Categories	Explanation
<b>Closed</b>	Certified operation has successfully met the CAR and addressed the underlying noncompliance.
<b>Open</b>	Certified operation has <u>not met</u> the CAR; underlying noncompliance is still present. CAR becomes a Major CAR with a 3 month deadline for compliance

*There have been changes in terminology and format for SmartWood reports since the last assessment/audit. Minor CAR is equivalent to a condition given at the time of the assessment (i.e. Condition 1 = CAR 1/04 and so forth) or a CAR given at the time of an audit. A major CAR is equivalent to a pre-condition given at the time of assessment or it can be cause for a suspension of an existing certificate.*

CAR #: <b>1/04</b>	Reference Standard #: <b>Criterion 1.3</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	The staff do not have a written Chinese summary of the key points of the international agreements, which is important for the staff to be able to understand and implement them.
Corrective Action Request: <b>A summary of the key articles of the international laws and regulations maintained by Sino Forest shall be translated into Chinese and distributed to staff.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>Key elements of international laws, regulations, treaties and agreements that have been translated into Chinese and distributed to the relevant staff are:</b>	
<ul style="list-style-type: none"> <li>• <b>Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora</b></li> <li>• <b>Convention on Biological Diversity</b></li> <li>• <b>Forest Stewardship Council-Principles and Criteria</b></li> <li>• <b>International Tropical Timber Agreement (ITTA)</b></li> <li>• <b>International Labour Organization, C87 Freedom of Association and Protection of the Rights to Organization Convention.</b></li> <li>• <b>International Labor Organization, C98 Right to Organize and Collective Bargaining Convention, 1949</b></li> <li>• <b>World Health Organization Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2000-2002.</b></li> <li>• <b>World Health Organization Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2000-2002: Class 1a &amp; 1b (WHO 2002)</b></li> <li>• <b>FSC Policy and Standards Unit—Chemical Pesticides in Certified Forests: Interpretation of the FSC Principles &amp; Criteria (FSC 2002)</b></li> </ul>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>2/04</b>	Reference Standard #: <b>Criterion 4.4</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	An evaluation of social impact has not been made and how to accomplish it is not mentioned in the plan.
Corrective Action Request: <b>JFDC shall develop a thorough list of the primary social impacts from its harvesting operations and implement a systematic process to consult with affected landholders prior to new operations that incorporates the findings from such consultation in future planning.</b>	
Timeline for Compliance: <b>By the end of the first year of certification</b>	
<p>Audit findings: <b>JFDC has been investigating the potential social and environmental impacts. A list of these potential impacts has been documented along with a description of the management or social element that may be affected and how critical the impact may be. The list of potential impacts includes: adaptability of the plantation species, forest conversion, influences on local culture and society, soil erosion and compaction, site productivity, nutrient consumption, water consumption, water conservation, exotic species invasion issues, influences on local ecosystems, effects on fauna and flora, restoration and succession, longterm impacts on landscape ecosystems, species diversity, rare threatened and endangered species, influences on vegetation types, population dynamics, genetic diversity, conservation of sensitive areas, chemical applications and other waste that may be harmful to the environment, forest fire and other natural disasters, and sustainable development.</b></p> <p>The stakeholders potentially affected by these impacts include, national/local authorities, local society, concerned organizations, and plantation managers. Each potential impact is coded as such: 0=not an issue, 2=not an issue with proper conventional management, 4=issue can be solved with new technologies in management. JFDC also recognizes that issues with stakeholders may change over time.</p> <p>JFDC has collected and analyzed some data since the certification assessment took place in 2002 concerning some of the more important issues mentioned above. Here is a synopsis of their findings:</p> <ul style="list-style-type: none"> <li>• A very small portion of the plantation will lower the water availability in the first year of planting, from the second year onward it will gradually increase to a level higher than before eucalyptus was planted. Water availability will decrease up to 6 months after harvesting, however, the water level will go back to normal. Harvesting in the dry season will minimize this impact.</li> <li>• The growth rate of vegetation on the lands is accelerated after the lands have been forested (mainly because of fertilization). This has been beneficial for mitigating serious soil erosion problems that occurred before the JFDC plantations were established.</li> <li>• Because of the thick understory vegetation that is left relatively undisturbed in the plantation during harvesting there is minimal impact to the surface soil erosion from harvesting. Moreover, after 6 months from harvesting, coppice growth can normally reach a height of 2 meters and understory vegetation re-grows accordingly.</li> <li>• The dense vegetation cover provided by the plantations has created both the number and types of animals to increase, particularly birds and bees. Harvesting does temporarily affect the habitat of those animals. However, this habitat can recover within 6 months of harvesting (see above bullet). Observations by villagers and JFDC staff has found that animals would temporarily migrate to the neighboring plantations during and right after harvest.</li> </ul>	

- Soil degradation does not appear to be problem in the eucalyptus plantations. On the contrary, planting eucalyptus appears to benefit the soil fertility by providing better conditions like fallen leaves, branches and wood residue as nutrient building compost material for soil microorganisms.
- Heavy rainfall within 6 months of harvesting period will influence water quality; therefore the harvesting should be restricted to smaller areas and in the dry season to minimize the effects to water quality.
- JFDC has received no complaints from farmers, pond owners or others about the contamination of fishponds or drinking water before, during and after harvesting operations.
- The farmers welcome the plantations because it contributes to the public infrastructure like road construction and maintenance, and water supply systems.
- The value of the hill land to the local people has risen since the plantation has been operating. In 2004, the production value of eucalyptus harvested ranged from 200RMB to 700RMB per mu/per year. This is 33 to 116 times more than the value of non-commercial forests (worth about 6 RMB per mu/per year) and 3-6 times the value of pine plantations.
- The Kwungjiao village committees of Huilong received 600,000 RMB income from harvesting 2000mu of plantation in 2004. This was the largest amount of income for a single community project since Chinese liberation in 1949.
- The plantation has helped alleviate unemployment. From the establishment of the plantation to date, employment generated the equivalent of 120,000 person workdays. The plantation has also generated the usual multiplier effect by supporting local businesses and the creation of support industries like transport and small wood processing.

JFDC staff regularly interviews local community members as a way of gathering economic and social input. Additionally, the local villagers can voice their concerns to JFDC's forest protection crew, who patrol the plantations.

The plantations have been established in Huilong and Baizhu for some time now and all people know when and where operations will take place (most understand the harvest schedule and approximately when they will get paid). Moreover, there has been no dissent voiced during the audit, nor at the assessment stakeholder meetings in 2002. A clear majority of locals support the establishment and management of the plantations.

JFDC has developed a list of potential social impacts (and environmental and economic impacts). These elements will be visited regularly and tracked in their management plan. The issue of a "systematic process to consult with affected landholders" is not well defined by JFDC, however, practically, landholders have an effective mechanism for presenting "grievances" through their village representative or, as stated above, directly to JFDC protection staff on site. The village representatives interact with both the JFDC staff and the local forestry bureau. Given this structure, consultation is an ongoing process.

Status: Closed

Follow-up Action (if applicable): None

CAR #: <b>3/04</b>	Reference Standard #: <b>Criterion 4.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Procedure for monitoring livelihood benefits lacking.
Corrective Action Request: <b>JFDC shall have in place sufficient mechanisms that can confirm and monitor that villagers receive their contractually agreed share of the harvest.</b>	
Timeline for Compliance: By the end of the first year of certification,	
Audit findings: <b>Sino-Wood/JFDC and the local communities own 70% and 30% of the shares of the standing timber respectively. This is in the contract/agreement with the local farmer collectives. The process for paying the local community is structured as such:</b>	
<ul style="list-style-type: none"> <li>•</li> <li>• <b>An application for harvesting is made to the Gao Yao Forestry Bureau (GYFB). All three parties then (JFDC, GYFB and the local collective) verify the area to be harvested and the standing volume;</b></li> <li>• <b>Before harvesting, JFDC informs the representatives of the local collective that the payment of their 30% to GYFB has been made and GYFB or the Gao Yao Forest Trade and Development Company (GYFTDC) then transfers the payment to the representatives of the local collective. The Collective democratically decides how the finds will be disbursed;</b></li> <li>• <b>All taxes, fees and the 30% owed to the local collectives must be paid before the GYFB will issue a harvesting and transportation permit to JFDC.</b></li> <li>• <b>JFDC receives a receipt from the forestry bureau when they have paid their taxes, fees and royalties.</b></li> </ul>	
<p>The farmer collective were established in South China in the 1950's. These collectives and their democratic processes are well institutionalized and respected by government and business. The collectives are known for adamantly protecting their rights. Both GYFB/GYFTDC and JFDC realize that to have a successful long-term plantation business, it is important to protect the rights of the collective and their members.</p>	
<p>JFDC began harvesting (on the over-mature World Bank plantation) and planting in Huilong and Baizhu 2001. JFDC claims that they have not had any problem with complaints from the local villagers with regards to payment. Additionally, SmartWood's stakeholder interviews during the 2002 assessment and the 2005 audit have not uncovered any problems with the local villagers getting their share of the harvest. The auditors reviewed JFDC's record of receipts for paying their taxes, fees and 30% royalty to the collectives. Therefore it appears that the mechanism described above is working adequately.</p>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>4/04</b>	Reference Standard #: <b>Criterion 5.4</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	There is no encouragement of the utilization of lesser-known plant species for commercial or subsistence purposes. The company has not considered non-timber forest products (NTFPs) during forest use and processing.
Corrective Action Request: <b>JFDC will demonstrate company efforts made to investigate and/or promote commercial or subsistence NTFP harvesting from the plantations.</b>	
Timeline for Compliance: During the period of certification, evaluated at each annual audit.	
Audit findings: <b>JFDC allows local farmers or villagers to raise honeybees in its eucalyptus</b>	

plantations during the flowering season from August to October. Bee honey produced from eucalyptus flowers has a relatively significant market at a premium price. There is also the added benefit that there is no use of chemical pesticides in the plantation, which makes the plantations healthy for both the bees and the consumers of the honey. In addition, of course, farmers and locals can take the limbs that naturally fall from the trees between harvests, and take unmerchantable parts of the tree during harvest, for fuelwood.

JFDC has made some efforts to investigate and promote commercial or subsistence NTFP harvesting. They have not refused farmers or locals the option of managing NTFPs (as with the case of the bees and the fuelwood harvesting). It appears to the auditors that the initiative to establish NTFP's in the plantations must come from the farmers. Once a local villager or farmer contacts JFDC about a potential NTFP proposition, then it would be more appropriate for JFDC to investigate the possibilities of NTFP production. Evidence so far indicates that there is no adversarial relationship between JFDC, GYFB and the collective members. It would appear that the local farmers would feel free to approach JFDC with proposals.

It appears that the farmers in the collectives are already extremely busy tending their own crops. It is already difficult for the harvesting contractors, for example, to get local labor because so much effort is going towards agriculture/aquaculture. Moreover, the villagers/farmers appear to be satisfied with the financial returns from the plantations that add to their existing agri/aquaculture incomes.

Status: **Closed**

Follow-up Action (if applicable): None

CAR #: <b>5/04</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Soil and water quality monitoring needs improvement.
Corrective Action Request: <b>JFDC will have available initial results from soil and water quality monitoring. These will include monitoring of soil erosion and water quality during and after harvesting, with special attention paid to slopes over 25 degrees, ESAs, and areas where new roads have been constructed. No new plantations shall be established on slopes over 25 degrees or in ESAs until the company has sufficient evidence from monitoring that management activities, including harvesting (on existing plantations on slopes over 25 degrees), are not having an adverse impact on these areas. Analysis of monitoring data will be made available at each subsequent annual audit.</b>	
Timeline for Compliance: By the end of the first year of certification	
Audit findings: <b>JFDC has been monitoring water quality/availability, soil nutrition, fungicide residues. Fungicide residues have been monitored in nursery soils since 2002. Water quality testing at two locations started in 2002 and another one began in 2004. Water availability research and other issues concerning neighboring fishponds were initiated in 2003 and 2004. Soil nutrition monitoring in 2004 and soil erosion started in 2003. Fertilizer component analysis began in 2001 and 2004.</b>	
The main conclusions of the monitoring to date are as follows:	
<ul style="list-style-type: none"> <li>• The quality of watercourses and bodies has not deteriorated since 2002. Results showed that JFDC's plantation operations do not adversely affected water quality.</li> <li>• There was no evidence that JFDC's eucalyptus plantations adversely affect water</li> </ul>	

availability.

- Residue from the two fungicides, Carbendazim and Chlorothalonil, used in the nursery were either not detectable or barely measurable.
- There was no evidence at this point to indicate soil nutrition levels have suffered from the eucalyptus plantation when compared with the Masson pine stands. However, the maintenance of nutrient levels could be attributed to the sufficient application of fertilizers and the additional inputs to the soil of leaf litter and wood residue.
- The fertilizer components tested well, however, the ingredient mix was adjusted to better meet the needs of the plantation.
- Soil and vegetation disturbance caused by harvesting and road construction has been monitored since 2003. The preliminary results showed that harvesting unavoidably reduces the site vegetation coverage and causes soil disturbance that may lead to erosion. Road construction removed vegetation and directly causes soil erosion. However, the monitoring results also showed that these issues were under control in the first year because 1) harvesting time was limited to the seasonal dry period, 2) thick vegetation was maintained on site, 3) proper road design and position, and 4) well harvesting operations.

*(Full monitoring results were provided as part of Sino/JFDC's 2004 progress report)*

No new plantations will be established in Huilong and Baizhu, so no new plantations will be established on slopes over 25 degrees. However, as the SmartWood auditors evaluate more fully the plantation management and ramifications of harvesting on slopes over 25 degrees the better the issues are understood. First, JFDC plantations have been placed on lands designated as production forest by the government and the local communities. When the plantations were set up, the community was expecting to receive a certain amount of compensation for the harvests. If areas are not planted and/or harvested, the communities lose revenue and that creates both a contractual and socio-economic issue for JFDC.

Secondly, the plantations are on landscapes that have been highly modified. For more than a thousand years these lands have been tended for agriculture and stripped of timber for housing and fuelwood. The lands near and in the stream courses have been either developed into rice paddies, vegetable gardens or fishponds. There are very few, if any, "wild and free flowing" streams with naturally occurring habitat or aquatic species. In essence, planting, harvesting or road building on slopes 25 degrees or greater is more of a socio-economic issue than an environmental one. Sediment or erosion that may be released from harvesting or road building would primarily impact local agriculture and/or aquaculture and/or drinking water. The local farmers and communities members that are dependent on good water supplies are very conscious water quality/availability issues.

Thirdly, harvesting is done by hand, there is no mechanized equipment (other than to build roads and haul logs) used in logging. Soil disruption during this process is low. Vegetation is conserved on the site during harvesting, leaving a degree of soil protection. The eucalyptus species can re-grow to 2 or more meters in height within 6 months of harvesting providing both live roots to maintain slope stability and crown closure to deflect direct rain exposure to the soil.

It is not surprising, therefore, that monitoring done by JFDC has shown only minor issues with soil stability, sedimentation and water quality or availability. Moreover there have been no complaints from local farmers or community members about these issues either.

However, the plantations are young and harvesting and road building is only just beginning on

many of the steeper areas. The auditors reviewed some visual evidence of erosion on the newly built roads. How extensive that may become in the next year or so remains to be seen. It would therefore be prudent to be cautious and more scientific in engineering and building roads and when harvesting large areas in short time frames. These issues are discussed in this report in response to minor CARs 17, 23, 26 and 27.

Monitoring appears to be institutionalized with regards to soil erosion and water quality on slopes both over and under 25 degrees. In addition, local farmers and community members are also “monitoring” the effect of the management on their crops and drinking supply.

Status: **Closed**

Follow-up Action (if applicable): None

CAR #: <b>6/04</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Monitoring of impacts on fisheries, wildlife and recreation need improvement.
Corrective Action Request: <b>JFDC will make available to the auditor information that documents efforts to identify and contact recreation and fisheries collectives or groups, inviting them to assist in the collection of qualitative and quantitative data on impacts on fisheries, wildlife, recreation, etc.</b>	
Timeline for Compliance: By the end of the first year of certification	
Audit findings: <b>JFDC staff provided documents to the auditors that detailed their efforts to work with local collective members and recreation facility owners on collecting plantation impact data on fisheries, wildlife and recreation. JFDC has conducted interviews with government officers, local villagers, the recreation groups and neighboring fishpond farmers for impacts on fisheries, wildlife, recreation.</b>	
<ul style="list-style-type: none"> <li>• <b>There is anecdotal information from government officials that there has been an increase in birds and butterflies since the establishment of the eucalyptus plantations in the early 1990s.</b></li> <li>• <b>Water quality was tested by sampling water from several water bodies. Two of the water bodies were within the plantation area and one was in an ecological service forest. The testing took place in June 2002, January 2003 and August 2004. The water bodies were tested for Chemical oxygen demand, total phosphorous, Kjeldahl nitrogen and suspended solids. Additionally, the Center of Analysis and Test, Guangdong Institute of Eco-Environmental and Soil Science carried out all the lab tests. Results showed no significant differences created by the plantations management. If anything the results showed improvement in the water quality in the plantation area. Again, it may still be too early to make any definitive conclusions.</b></li> <li>• <b>Twelve fishpond owners were interviewed and were asked if the plantation management: changed of water availability, water quality, created topsoil erosion, or produced runoff that was harmful to fish. The were also asked about their overall evaluation of impacts, the worst impact that they had experienced, and any other comments that they might have about the plantation management. The villagers indicated, corroborated by the auditors, that water levels of the fishponds near JFDC’s plantation sites appear to have maintained normal levels, even though 2004~2005 wet season has been the driest in decades. They saw no difference in water quality, although they do worry about soil erosion from forest roads. No harmful substances were reported entering the fishponds.</b></li> </ul>	

<p>Interviews with the nearby ecological park and the golf course staff, corroborated by the auditors in the field, showed that they believe that there have been no negative impacts on wildlife and recreation at their facilities from the plantations. The Guangxi Agricultural Ecological Garden is home to the Chinese Egret (<i>Egretta eulophotes</i>) one of the fifty rarest birds in the world. The garden appears to have a significant flock in terms of the total world population (about 50 out of 2500). The eucalyptus stands also provide an aesthetic backdrop for these recreational facilities and play a role in protecting the environment and water bodies.</p>
Status: <b>Closed</b>
Follow-up Action (if applicable): None

CAR #: <b>7/04</b>	Reference Standard #: <b>Criterion 5.4</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Construction of roads when soil erosion impacts could be high
Corrective Action Request: <b>JFDC shall limit construction of new roads as much as possible to the dry period (October through March) only, and the Management Plan and the Roads Plan will be revised to reflect these changes.</b>	
Timeline for Compliance: By the end of the first year of certification.	
Audit findings: <b>JFDC has revised its Management Plan and Operation Guidelines to limit new road construction as much as possible to the dry period between October and March. However, the heaviest rains are generally from June through August and JFDC may carry out road construction up to June and start again in September, depending on the situation. Some soil moisture content is desirable in creating a well-compacted road surface.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>8/04</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Monitoring water availability
Corrective Action Request: <b>JFDC will develop a strategy for monitoring the impact of plantations on water availability. By the end of the second year of certification, a monitoring system will be in place. By the end of the third year of certification and each year thereafter, monitoring results will be made available to the auditors.</b>	
Timeline for Compliance: By the end of the first year of certification.	
Audit findings: <b>JFDC has developed a monitoring plan that includes as one of its elements water availability. The plan was presented to and reviewed by the auditors. It fulfills the first part of this CAR.</b>	
<p>As stated above, some preliminary information has been gathered in the certified plantations. Interviews with local villagers suggest that there has been little to no impacts so far. In addition, there has been other scientific research done on the subject of water availability that suggests that if annual rainfall is above 1200 mm, the eucalyptus plantations will have minimal impact on water availability. The area surrounding Gao Yao average about 1927 mm/yr.</p>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): <b>To help future auditors distinguish what CARs need reviewing, new CARs have been developed to identify the 2<sup>nd</sup> and 3<sup>rd</sup> year requirements of this CAR.</b>	

CAR #: <b>9/04</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Sediment monitoring relative to fish could be improved
Corrective Action Request: <b>JFDC will compile a list of listed fish species present in the Xizang River and its tributaries that may receive sediment from company-managed lands.</b>	
Timeline for Compliance: By the end of the first six months of certification.	
Audit findings: <b>JFDC compiled the list of fish requested by this CAR and presented them to the auditors. It is highly unlikely that sediment generated from the plantations will get into the Xizang River. The plantations are not close to the river and the tributaries that emanate from plantations are diverted for fishponds and agriculture long before the water reaches the river.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>10/04</b>	Reference Standard #: <b>Criterion 5.6</b>												
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	No clearly defined AAC												
Corrective Action Request: <b>JFDC shall annually update documentation that clearly demonstrates the sustained yield of the plantations.</b>													
Timeline for Compliance: During the period of certification.													
Audit findings: <b>JFDC has updated their AAC, using the area control method, in their management plan. The AAC for plantations outside Baizhu and Huilong will continue to fluctuate given that more plantations are planned for those areas. As stated above, plantations are fully developed in Baizhu and Huilong and therefore the AAC will remain relatively constant given the minor fluctuations from age-class and species (eucalyptus vs. acacia) distribution. The management plan was presented to the auditors.</b>													
<p><b>Area control AAC is calculated:</b></p> <ol style="list-style-type: none"> <li>1. Sum the existing plantation areas by age class and divide that by the rotation age. The divided area is used as the basic annual cut for the next year,</li> <li>2. Stand age eligible for harvest is 5~7 years (to regulate even flow age class distribution),</li> <li>3. If the total area of a stand is older than or equal to 6 years and is larger than the basic annual cut calculated in step 1, the AAC will be the annual harvest for the next year,</li> <li>4. If the total area of a stand is older than or equal to 5 years and is smaller than the AAC, then this area will be the planned annual harvest for the next year,</li> <li>5. Repeat from 1 to 4 for the subsequent years by taking age increase for different stands into account,</li> </ol> <p><b>The actual harvest area in Baizhu and Huilong were lower than the projected harvest for 2004. Part of the lower harvest is that the optimal growing period of acacia is greater than 6 years.</b></p> <p><b><u>2004 Harvested Area and Volume in Baizhu and Huilong Townships</u></b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Area (ha)</u></th> <th style="text-align: center;"><u>Standing Vol.(m3)</u></th> <th style="text-align: center;"><u>Recovery Vol.(m3)</u></th> </tr> </thead> <tbody> <tr> <td>Baizhu</td> <td style="text-align: center;">344.11</td> <td style="text-align: center;">30,056</td> <td style="text-align: center;">22, 542</td> </tr> <tr> <td>Huilong</td> <td style="text-align: center;">325.1</td> <td style="text-align: center;">27,300</td> <td style="text-align: center;">20,475</td> </tr> </tbody> </table>			<u>Area (ha)</u>	<u>Standing Vol.(m3)</u>	<u>Recovery Vol.(m3)</u>	Baizhu	344.11	30,056	22, 542	Huilong	325.1	27,300	20,475
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Huilong	325.1	27,300	20,475										
Status: <b>Closed</b>													

Follow-up Action (if applicable): None
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CAR #: <b>11/04</b>	Reference Standard #: <b>Criterion 6.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Maps need to include more information.
Corrective Action Request: <b>JFDC shall produce maps that identify adjacent forests (including type, owner and contact information), water bodies (large ponds, reservoirs, all perennial watercourses, seasonal watercourses, wet areas, and springs), protected areas (including manager and purpose), and agricultural lands.</b>	
Timeline for Compliance: By the end of the second year of certification.	
Audit findings: <b>Not due until the 2006 audit.</b>	
Status: <b>Open</b>	
Follow-up Action (if applicable):	

CAR #: <b>12/04</b>	Reference Standard #: <b>Criterion 6.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Environmental impacts assessment needs improvement
Corrective Action Request: <b>JFDC shall develop and implement a protocol for conducting impact assessments of sites prior to substantial operations, such as site selection for plantation expansion, harvesting, site preparation, road construction, planting and stand tending.</b>	
Timeline for Compliance: By the end of the first year of certification.	
Audit findings: <b>A protocol has been developed for conducting impacts assessments on sites before activities begin. An assessment form provides guidance to JFDC foresters in the field in estimating the severity of potential impacts. This form has been used once (reviewed by the auditors). The potential impacts discussed are those that have an effect on erosion, water quality, water availability, vegetation cover, RT&amp;E species, biodiversity, agriculture protection, social issues, etc. While the protocol has been developed and used, it is not well understood yet by JFDC staff and its utility not fully realized.</b>	
<p><b>The eucalyptus stands are rotated every 6 years. Impacts assessments for each element mentioned in the CAR are not as strategically important as long term monitoring. The impacts caused by a single entry will have impacts of course, but more at issue is the continual cutting, planting road building/maintenance over several rotations. As discussed above, JFDC is doing a good job of developing and implementing relevant monitoring procedures.</b></p>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): <b>JFDC staff needs training on how to implement the company's environmental impacts assessment procedure. See CAR 03/05</b>	

CAR #: <b>13/04</b>	Reference Standard #: <b>Criterion 6.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	A system for identifying and protecting rare, threatened and endangered (RTE) species needs improvement
Corrective Action Request: <b>A system will be developed for actively identifying, listing, and/or protecting RTE species and their habitats that potentially occur on JFDC managed property.</b>	
Timeline for Compliance: By the end of the first year of certification.	
Audit findings: <b>A list of RTE species for Gao Yao city area and surrounding regions has been compiled. Moreover, JFDC has added pictures and descriptions of the species for field identification purposes. This list will be updated where applicable. The list is part of the JFDC documentation that was reviewed by the auditors.</b>	

According to JFDC there are no RTE species currently found in JFDC plantations nor is there foraging or roosting habitat areas. JFDC's information is primarily anecdotal input from local farmers, workers or forestry personnel. There does not appear to have been any scientific survey.

It would not be surprising that RTE species would not be found. The plantation species is exotic to the area and the landscape has been severely modified from its natural state over the past millennia. Even the "ecological service forests" that are used for protecting water resources and wildlife are Masson pine (*Pinus massoniana*) planted as a plantation species in the 1960s-80s. Although Masson pine is native to south China, it would certainly not likely to be found in such abundance or with the current plant association in its natural state. However, there has been no professional review or analysis by biologists of the information gathered on RTE species or the prospects of finding them within the plantation area.

Status: **Closed**

Follow-up Action (if applicable): **A professional biologist must conduct on-site research to determine what terrestrial and aquatic plants and wildlife actually inhabit the plantation area and whether RTE species and/or their habitat exist within the plantation area. Protection measures for wildlife and RTE species and research findings must be documented.**

CAR #: <b>14/04</b>	Reference Standard #: <b>Criterion 6.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Key personnel cannot identify RTE species.
Corrective Action Request: <b>JFDC will have trained key field personnel in RTE species identification and the company measures to protect these species.</b>	
Timeline for Compliance: By the end of the second year of certification,	
Audit findings: <b>As mentioned above, a list of RTE species for Gao Yao city area and surrounding regions has been compiled and pictures and descriptions of the species have been added to the documentation as a guide for field identification purposes. Training has been given to the main staff and the forest protection crews. JFDC's policy is to take the following measures: 1) JFDC staff and crew will make it a priority to identify RTE species, 2) any RTE species that is identified shall be immediately reported to the relevant administrative units (such as the local forestry bureau), 3) JFDC will cooperate closely with relevant parties and agencies to conserve the species and, 4) JFDC will convert plantation stands lands to habitat suitable for the species if necessary.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): <b>Protection measures for wildlife and RTE species must be documented. See CAR 4/05</b>	

CAR #: <b>15/04</b>	Reference Standard #: <b>Criterion 6.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Management in ecologically sensitive areas have not been developed
Corrective Action Request: <b>Guidelines for management of Ecologically Sensitive Areas will be developed.</b>	
Timeline for Compliance: By the end of the first year of certification.	
Audit findings: <b>A written procedures guideline has been developed for the management of ecologically sensitive areas (ESAs). The auditors reviewed the guidance document.</b>	
<p>The guidance document defined <i>potential</i> ESA areas as:</p> <ul style="list-style-type: none"> <li>• Areas where regular operations may have adverse impacts on the surrounding ecological</li> </ul>	

and environmental conditions by: polluting water resources; creating soil/water erosion; promoting chemical runoff; disruption of special habitats, etc.

- 10~20m buffer zones adjacent to water bodies (reservoirs, fish ponds and lakes), watercourses (rivers and creeks);
- 10~20m buffer zones along the road system;
- Mountain valleys or habitats with special values for wildlife species;
- 10~20m buffer zones close to villages or other residency area;
- Steep slopes over 25 degrees within plantations.
- Other areas that may be sensitive to ecological impacts.

If an area is designated as an ESA, operational guidelines are designed to minimize impacts. The operational guidelines address site preparation, species to be planted, application of chemical fertilizers and pesticides, site management and harvesting and regeneration. Moreover, the operational guidelines specify monitoring and feedback procedures that include identifying monitoring indicators, water quality analysis, vegetation analysis, soil erosion analysis, inspection of operations, data analysis, and feedback and management implications.

Status: Closed

Follow-up Action (if applicable): See CAR 4/05 with regards to research by a biologist.

CAR #: <b>16/04</b>	Reference Standard #: <b>Criterion 6.4</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Representative samples of ecosystems need to be identified.
Corrective Action Request: <b>JFDC shall annually provide to the auditors a summary of the size, location, function, and management (including extent of JFDC involvement) of any set-asides and include maps showing their location. Prior to converting any pine plantations or other lands to plantations, JFDC shall indicate whether or not there are set-asides that contain representative examples of the area being converted.</b>	
Timeline for Compliance: During the period of certification.	
<p>Audit findings: <b>The only “set-asides”, e.g. lands where there is limited or no management, are those areas demarcated by the government as ecological service forests. JFDC does not own them, but participates in their management by providing forest protection staff to patrol them to for preventing forest fires and make sure that they are not being illegally exploited. The auditor’s interviews with the local collective representatives corroborated that JFDC was in fact providing forest protection.</b></p> <p><b>The function of the ecological service forests is primarily to protect domestic water bodies, e.g. water reservoirs for village drinking water. These set-asides are not “Representative samples of existing ecosystems ...in their natural state” as called for in FSC Criterion 6.4. As stated above, the ecological service forests are primarily Masson pine planted as a plantation species in the 1960s-80s and, although Masson pine is native to south China, these units would not be considered a representative examples of a native ecosystem.</b></p> <p><b>There is also an “agricultural ecological garden” and a golf course in the Huilong township. These two areas will not likely be modified to any great degree from their current vegetative state. However, neither of these contains “natural ecosystems”. Eucalyptus from the old World Bank plantations is part of the golf course. The eucalyptus will be allowed to grow, but they will probably be thinned to maintain the ambience of the golf course. Most of the species in the ecological garden are exotic, yet provide some bio-diversity.</b></p>	

The native landscape has been modified for plantations, aquaculture and agriculture for millennia. There are no representative examples of ecosystems in their native state in the Huilong and Baizhu townships. However, these ecological service forests do provide biological diversity and stability (not likely to be modified for long periods of time), which is important in that respect. The laws are clear that these areas are to be preserved. Additionally, some of the collectives elected not to convert all of their pine plantations to eucalyptus. Although the “preservation” of these areas is up to the collective (not JFDC), it is likely that they will remain in some vegetative state other than eucalyptus.

The ecological service forests are on JFDC maps (1:10,000). JFDC has not and will not convert any more forests in the Huilong and Baizhu townships to eucalyptus or acacia plantations.

Status: **Closed**

Follow-up Action (if applicable): None

CAR #: <b>17/04</b>	Reference Standard #: <b>Criterion 6.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	<b>Guidelines for minimizing impacts from harvesting and road construction need improvement.</b>
Corrective Action Request: <b>JFDC shall write technical guidelines and implement specific measures to minimize impacts from harvesting, road construction, and all other mechanical disturbances to control erosion and protect water resources.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>JFDC technical guidelines have been revised to minimize the impacts from site preparation, harvesting, road construction and all other mechanical disturbances. The most important measures include limiting road construction primarily to the dry period from October through March, limiting harvesting and other main operations from September through May (forbidden in the period from June to August), restricted to manual operations in site preparation, planting, harvesting etc.</b>	
<p>The auditors reviewed some visual evidence of erosion on the newly built roads. How extensive that may become in the next year or so remains to be seen because the roads are new. The roads, however, are not well engineered. They slope inwardly and have no inside ditch to carry water. There is also a lack of cross draining to periodically remove running water from the road surface. Although the technical guidelines give guidance for season of the construction, slope gradient and ESA’s, it does not provide engineering specifications for road design and construction.</p> <p>The auditors also reviewed some borrow pits that were dug for new road construction. There was some evidence of soil erosion and the borrow pit was dug from an area that drains water. They were adjacent to the forest and it was not clear whether they were on local community or JFDC land. JFDC does not have any special guideline for the development of these pits and haven’t defined any measures to restore them after use.</p>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): <b>Develop or obtain engineering specifications for road design and construction, including construction, maintenance and restoration of borrow pit. Train foresters to design appropriate roads and train tractor operators to build roads to specifications. Develop guidelines with local community input about the construction, use and restoration of borrow pits. See CAR 5/05 and observations</b>	

CAR #: <b>18/04</b>	Reference Standard #: <b>7.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Management plan needs improvement.
<p>Corrective Action Request: <b>JFDC shall incorporate into its planning documents the following information:</b></p> <ol style="list-style-type: none"> <li><b>3. Identification of critical issues, or important management concerns, other than timber production, as well as short-term and long-term goals and objectives for non-timber issues.</b></li> <li><b>4. basic forest types and land uses in the region (landscape level), including at a minimum cover type/land use with brief explanations, estimates of % cover, including set-aside areas and protected areas;</b></li> <li><b>5. basic forest types and land uses on JFDC managed properties (forest-level), including cover type/land use, estimates of % cover, including set-aside areas and Ecologically Sensitive Areas;</b></li> <li><b>6. provide the rationale for the planned future establishment of large areas of plantation, explaining how such conversion provides a clear and long-term conservation benefit at the landscape level. Any mid-seral habitat should be identified and considered for set-aside.</b></li> <li><b>7. land (including water) or vegetative characteristics, human uses, etc. that are indicators of areas of important conservation value (particularly when assessing lands for conversion to new plantations), and a process to follow when such areas are identified;</b></li> <li><b>8. specific information on the designation and width of buffer zones around unstable areas, areas with active erosion, springs, wet areas, watercourses;</b></li> <li><b>9. a plan for monitoring soil erosion that, at a minimum, specifically addresses (1) monitoring soil erosion on sites where sediment may be transported to a perennial or seasonal watercourse, including the location of stations, parameters to be monitoring, frequency and timing of data collection and analysis and (2) evaluation of erosion hazard and rates on hill slopes with versus without plantations on slopes over 25°; for monitoring plans that assess on- and off-site environmental impacts (including water quality), identify baseline data to collect on soils, guidance to field personnel about estimating the hazard of soil erosion and what to do in areas of extreme erosion hazard;</b></li> <li><b>10. include how monitoring will be done to assess negative ecological impacts from exotic species, paying special attention to the alleopathic effects of eucalyptus.</b></li> </ol>	
Timeline for Compliance: By the end of the first year of the certification.	
<p>Audit findings: <b>JFDC has added objectives and elements to their management plan in compliance with condition 18. The auditors have reviewed the information and its inclusion into the revised management planning documents and policies.</b></p> <ol style="list-style-type: none"> <li><b>1) The following objectives have been added to the management plan.</b> <ul style="list-style-type: none"> <li><b>• Promote local forest development. Increase local forest coverage by planting trees on barren hills, abandoned (agriculture) lands, low yield plantation lands, and short-rotation plantation sites.</b></li> <li><b>• Control of soil and water erosion. Reduce operational impacts, maintain vegetation belts, promote rapid regeneration and maintain sensitive areas.</b></li> <li><b>• Enhancement of biological, ecological, environmental and landscape conservation. Design a regional silvicultural plan (based on CJVs and JFDC's commitment to regional cooperation), increase genetic diversity within plantations, increase species diversity, monitor and mitigate negative impacts,</b></li> <li><b>• Research potential forest by-products and NTFP utilization. Research the inter-planting of medicinal herbs, crops, teas, fruits in the plantations and production of</b></li> </ul> </li> </ol>	

- essential eucalyptus oils and pine resin etc.
- Support sustainable local social and economic development. Employ extra laborers for plantation operations and protection. Promote local forest product manufacturing and trading.
- Continuous improvement of forest management and socio-economic benefits. Continue to improve relationships with stakeholders by continuous improvement of management/operations and increased benefits to local people.

2) JFDC provided a detailed description of the landscape level land classification for the Gaoyao municipality, which includes Huilong and Baizhu. In Gaoyao, 55.8% of the total land area or 123,575.1 ha are designated as forestland. Of the 123,575.1 ha, 69.4% is commercial forest and 30.6% or 37,798.4 ha is either ecological service forest or non-commercial forest. Only 26.2% of the forest area is for short rotation plantations.

Table 1 provides a graphic overview of the Gaoyao landbase.

Table 1. Classifications and areas (ha) of Gao Yao's forest lands among 5 groups

Forest classification		A*	B*	C*	D*	E*
Ecological service forest	Water resources conservation	17,481.5	6.6	1,023.2	220.4	232.4
	Water/soil erosion control	11,606.9	6.5	1449.5	363.5	88.8
	Commune protection	3,385.3	3.8	12.2	21.7	0.6
	Scenic forest	901.4	0.0	0.2	31.4	0.0
	Other public service	930.7	0.0	0.0	18.0	13.8
Commercial forest	General timber production	19,831.1	18.4	0.0	620.3	440.3
	Short-rotation plantation	28,158.0	25.2	0.0	2,621.5	1616.0
	Fuel wood stands	647.8	0.0	0.0	0.0	0.0
	Oil trees plantation	264.0	0.0	0.0	0.0	0.0
	Tree fruit plantation	785.3	0.0	0.0	0.0	0.0
	Other non-timber tree crops	30,509.7	7.6	0.0	133.8	97.7

\* A=medium-age or mature forest group, B=low-density group, C=shrub group, D=young group and E=barren hills or abandoned agriculture land.

3) JFDC provides information on the following four types of forests in the Gaoyao municipality as indicated in several documents. There are 14123.25 ha of eucalyptus plantations, 1131.05 ha of acacia plantations, 697.6 ha of ecological service forest (not owned, but managed in cooperation with local forest stations, consisting of pine species), 200 ha of ecological sensitively areas within its eucalyptus and acacia plantations. JFDC manages or is involved in managing a total area of 19951.9 ha, accounting for 12.91% of total forests in Gao Yao.

4) JFDC's long-term development plan was prepared in 1990 according to Gao Yao's forest (classification) management plan/regulation. The JFDC's development plan was evaluated and approved by the city and provincial governments and accepted by the local collectives. The rationale has been stated to establish fast growing plantation species for commercial purposes and to benefit the local people. It has also been established that JFDC have not converted natural ecosystems for its plantation development and that JFDC plants fast-growing species on sites that have either been abandoned agriculture land or on old low density and mal-performing Masson pine plantations. Moreover, there will be no more plantations established in the Huilong and Baizhu area, although there will be some further establishment of plantations in the Gaoyao municipality as a whole. As stated earlier in this report, JFDC's new

management plan and policies address management impacts to biological conservation, habitats, ESAs, ESFs and community livelihoods.

5) The Gaoyao municipal government has a land use policy. The JFDC's development plan was evaluated and approved by the city and provincial governments and accepted by the local collectives with regards to this policy (law). Within these designated land use areas are areas for conservation, which are off limits to commercial forestry.

The Management Plan and operational guidelines document have clearly indicated the procedure JFDC uses to describe the land (including water), vegetative characteristics and human uses, etc. when assessing lands for conversion. When areas are identified there are provisions for investigating alternatives.

6) JFDC has an operational procedure for identifying ecological sensitive areas (200 ha have been identified). An identified ESA is usually just small part of a stand or sub-compartment. At this point ESAs are primarily steep slope and potential soil erosion areas. Additionally, watercourse/water body buffers are designated (10m-20m width).

Table 5. Ecological sensitive areas identified within JFDC's plantations in Baizhu and Huilong Towns

		5	Eucalyptus	12.64	0.80	Buffer zone	
	Shangkong	7	Eucalyptus	11.81	1.40	Buffer zone	
	Shangkong	10	Acacia	10.29	1.20	Buffer zone and steep slope	
		8	Eucalyptus	2.30	2.30	Soil erosion and Steep slope	
	Kuanjiao	14	Eucalyptus	20.92	7.30	Buffer zone and Steep slope	
	Chenghu	15	Eucalyptus	24.32	4.20	Buffer zone and Steep slope	
<i>Sub-total</i>		6		82.28	17.20		
		16	Eucalyptus	3.40	3.40	Buffer zone and soil erosion	
	Dongcun	17	Eucalyptus	5.40	5.40	Buffer zone and soil erosion	
	Dongcun	18	Eucalyptus	16.10	8.29	Buffer zone and steep slope	
	Dongcun	19	Eucalyptus	26.60	7.10	Steep slope	
<i>Sub-total</i>		4		51.50	24.19		
		5	Eucalyptus	19.98	14.40	Soil erosion	
	Shangdong	61	Eucalyptus	12.50	12.50	Buffer zone and soil erosion	
	Shixia	62	Eucalyptus	8.94	8.94	Buffer zone and steep slope	
	Shixia	67	Eucalyptus	4.80	4.80	Buffer zone and steep slope	
	Shixia	71	Eucalyptus	14.30	11.20	Buffer zone and soil erosion	
		72	Eucalyptus	12.40	8.90	Buffer zone and steep slope	
	Beifeng	78	Eucalyptus	16.20	16.20	Buffer zone and soil erosion	
	Kuanjiao	3	Eucalyptus	15.05	4.50	Steep slope	
	Kuanjiao	4	Eucalyptus	19.20	10.70	Steep slope	
	Kuanjiao	8	Eucalyptus	30.54	6.80	Steep slope	
	Kuanjiao	9	Eucalyptus	19.10	3.40	Buffer zone and soil erosion	

		Kuanjiao	9	Eucalyptus	19.10	3.40	Buffer zone and soil erosion
		Guangrong	21	Eucalyptus	4.60	4.60	Buffer zone and Steep slope
<b>Sub-total</b>			<i>12</i>		<i>177.61</i>	<i>106.94</i>	
2001	Baizhu	Jinpingchang	1	Eucalyptus	11.40	5.80	Soil erosion
		Jinpingchang	2	Eucalyptus	5.27	5.27	Buffer zone and soil erosion
		Jinpingchang	4	Eucalyptus	1.60	0.20	Buffer zone
		Jinpingchang	8	Eucalyptus	15.07	6.40	Soil erosion
		Jinpingchang	9	Eucalyptus	17.00	0.90	Buffer zone
<i>Sub-total</i>			<i>5</i>		<i>50.34</i>	<i>18.57</i>	
2002	Huilong	Wangdong	10	Eucalyptus	25.95	8.40	Steep slope
		Wangdong	11	Eucalyptus	24.20	7.20	Steep slope
		Chenghu	13	Eucalyptus	17.00	9.80	Steep slope
		Chenghu	15	Eucalyptus	19.40	7.70	Steep slope
<i>Sub-total</i>			<i>4</i>		<i>86.55</i>	<i>33.10</i>	
<b>Total</b>			<b>31</b>		<b>448.28</b>	<b>200.00</b>	

7) JFDC developed a monitoring plan for monitoring ecological/environmental conditions and social impacts of plantations (See CAR 5 above). JFDC initiated some monitoring in 2002. A preliminary monitoring report was provided to the auditors (attached to this report in an addendum). The results and conclusions obtained will be used to improve the monitoring system, and as reference to further develop scientifically comprehensive monitoring. A research project including this monitoring plan is now under consideration.

8) According to JFDC there is no scientific reports about the allopathic effects of eucalyptus plantations in China. On the JFDC plantations, there appears to be no effect on the understory vegetation and surrounding vegetation. However, JFDC will monitor for any adverse effects by closely monitoring the vegetation change within eucalyptus stands, compare the eucalyptus sites with other types of forests in the area (such as Masson pine stands at different ages) and investigate the effects of eucalyptus plantations on neighboring fish ponds. JFDC has an emergency procedure in place for any negative ecological impacts caused by eucalyptus, acacia and other potential tree species.

Status: Closed

Follow-up Action (if applicable): None

CAR #: <b>19/04</b>	Reference Standard #: Criterion <b>7.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	No clear system for revising the management plan
Corrective Action Request: <b>JFDC shall make available to the auditor the revised management plan and other revised plans each year providing examples of how information collected was incorporated into the revision of planning documents.</b>	
Timeline for Compliance: <b>At each annual audit.</b>	
Audit findings: <b>The Management plan has been updated annually since the certification in 2002. The monitoring plan and the road construction plan has also been revised.</b>	
Examples of how information has been collected have been presented to the auditors and are found in the documentation provided by JFDC in the appendices of this report. The auditors	

<b>reviewed the revised management plan. The management plan revision process is institutionalized to a point where this CAR can be closed. JFDC staff will report changes to management planning or status as a matter of course in future audits.</b>
Status: <b>Closed</b>
Follow-up Action (if applicable): None

CAR #: <b>20/04</b>	Reference Standard #: <b>Criterion 7.3</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Training for staff needs improvement.
Corrective Action Request: <b>JFDC shall continue to provide periodic trainings for staff and contractors. The content and frequency of this training must be adjusted to reflect changes in the management plan and as related to certification conditions.</b>	
Timeline for Compliance: <b>During the period of certification.</b>	
Audit findings: <b>JFDC provides technical training to staff both on a regular basis during staff meetings and when new operating procedures are proposed. Individual training also takes place when a staff member is a new hire, needs to upgrade their skills or when their job procedures change.</b>	
<b>Before each operation season, training is provided to staff on any new technology, operation guidelines or just to refresh them on existing procedures or guidelines.</b>	
<b>Contractors are also trained on a regular basis, primarily before each harvesting season. However, they would be provided with additional training if needed.</b>	
<b>Training is institutionalized to a point where this CAR can be closed, although training may be specified as part of another CAR developed during this or future audit.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>21/04</b>	Reference Standard #: <b>Criterion 8.3</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	CoC tracking documentation from forest to destination is lacking
Corrective Action Request: <b>JFDC shall develop a method for clearly indicating on trip tickets that harvested logs originate from certified forest operations.</b>	
Timeline for Compliance: <b>Prior to harvest or within six months of certification.</b>	
Audit findings: <b>JFDC is not selling logs as certified at this time; therefore indicating that the logs are certified is a mute point. However, required provincial transportation documents must accompany the loads of logs from forest to destination. The transportation permit contains the supplier, buyer, harvesting location ( town, village, place name, sub-compartment stand no), harvesting permit no., destination, species, harvesting unit, type of harvesting, harvesting duration, harvesting volume, product volume, regeneration method and regeneration area. This information will provide excellent tracking for CoC with the addition of the FSC certification number on permits that come from the certified plantations.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): See CAR 7/05	

CAR #: <b>22/04</b>	Reference Standard #: <b>Criterion 8.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Summary of the management plan lacking.
Corrective Action Request: <b>JFDC shall have a summary of the primary elements of the revised management plan and a summary of the results of monitoring available and will provide it, upon request, to anyone who should ask for a copy.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>JFDC has prepared a summary of the management plan and monitoring results (in English and Chinese). They are available to anyone who requests them. The auditors have reviewed the summaries.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>23/04</b>	Reference Standard #: <b>Criterion 10.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Full description of buffer zones and clearcut sizes.
Corrective Action Request: <b>ESAs shall more fully describe characteristics of watercourses and waterbodies that will be protected and describe any no-cut buffer zones. The management plan shall explicitly state the maximum size of clearcut units and adjacency requirements.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>A written procedures guideline provides for a description of ESAs and their management and buffer zones. See CAR 15/04 above. In addition, ESFs are outlined in CAR 18 above.</b>	
<p><b>The characteristics of watercourses and waterbodies have been described. Watercourses, other than some ephemerals (only runs water when it is raining), have been captured and altered for use in agriculture and fishponds. Waterbodies are fishponds, irrigation ponds or drinking water. Drinking water reservoirs are protected by ESFs where no commercial harvesting is allowed and is not part of JFDC's commercial forest enterprise.</b></p> <p><b>The management plan clearly states that the maximum clearcut size is 300 ha. Adjacency requirements are not explicit. Vegetation is conserved on the site during harvesting, leaving a degree of soil protection. The eucalyptus species can re-grow to 2 or more meters in height within 6 months of harvesting providing both live roots to maintain slope stability and crown closure to deflect direct rain exposure to the soil. However, JFDC does not comply with national regulation. According to the <i>Regulation on Forest Harvest and Regeneration</i> issued by State Forest Administration in 1997, the maximum clearcutting area is no more than 5 ha and could be expanded to 20 ha for fast growing forest established on gentle slopes and fertilized soils.</b></p> <p><b>CAR 27/04 is very similar in content, therefore CAR 23/04 will be closed and a follow-up CAR will be proposed in CAR 27.</b></p>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): None	

CAR #: <b>24/04</b>	Reference Standard #: <b>Criterion 10.4</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Considering native species options for plantation species
Corrective Action Request: <b>JFDC should compile a list of native species they are considering for plantation establishment and set-aside management. By the end of the second year and on an</b>	

<b>ongoing basis, JFDC will continue and expand research and development of native species for plantation establishment and/or to include within plantations of exotics.</b>
Timeline for Compliance: <b>By the end of the first year of certification.</b>
Audit findings: <b>A list of native tree species was developed as a reference for potential development of plantations. A research project was started in 2004 comparing native species with eucalyptus and acacia species, which will be measured and summarized, by the end of 2005 or 2006. Other experiments for ecological forests management purposes, which may cover much wider range of climatic and site conditions, are under planning,</b>
<b>Set-asides are ESFs. The government manages these forests with help from JFDC. JFDC could only recommend that the government look into native tree enrichment planting for the ESFs.</b>
Status: <b>Closed</b>
Follow-up Action (if applicable): <b>None</b>

CAR #: <b>25/04</b>	Reference Standard #: <b>Criterion 10.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	System for evaluating benefits of exotics in ESAs.
Corrective Action Request: <b>New planting (including re-plantings) in ESAs shall be limited to native species unless a reasonable and persuasive argument can be made in terms of ecological, economic, and social benefits for the planting of exotics.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>There have been no new plantings or re-plantings in 2004. JFDC has done research into appropriate plantation species. Thus far, eucalyptus and acacia appear to be the best suited both for the environment and for the local economy (see other areas of this report that describes environmental assessments, monitoring and discussions with stakeholders). JFDC plantations are designated as production forest by both the government and the local communities. The community expects to receive a certain amount of compensation for the harvests. Changing species to one that may possibly be more environmentally appropriate may have serious financial and social implications. It appears that in the context of the region, history of land use, the markets for wood products and socio-economic and cultural factors, the current exotic species may be the most appropriate.</b>	
Status: <b>Closed</b>	
Follow-up Action (if applicable): <b>None</b>	

CAR #: <b>26/04</b>	Reference Standard #: <b>Criterion 10.6</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Guidelines for road construction, maintenance and site prep need improvement
Corrective Action Request: <b>Written guidelines for road construction, road maintenance, and site preparation shall specify that no fill or waste material will be placed in watercourses.</b>	
Timeline for Compliance: <b>By the end of the first year of certification.</b>	
Audit findings: <b>JFDC technical guidelines have been revised to describe elements of road construction and site preparation. The most important measures include limiting road construction primarily to the period from October through March, although cautiously allowed from September through May (forbidden in the period from June to August). The guidelines also address the issue of keeping road fill from watercourses.</b>	
<b>The auditors did, however, view evidence of erosion and road fill near watercourses on the newly built roads. As stated earlier, the roads are not well engineered. Although there are no “free flowing” streams, some of the roads were placed near waterways and the bottom of ravines.</b>	

Status: <b>Closed</b>
Follow-up Action (if applicable): See CAR 5/05 prepared as a result of CAR 17/04

CAR #: <b>27/04</b>	Reference Standard #: <b>10.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Harvest areas are large and may cause impacts to the environment.
Corrective Action Request: <b>Disperse the harvest so that adjacent areas, approximately equal to the harvested area in size, is harvested in subsequent year.</b>	
Timeline for Compliance: <b>During the period of regulating age class distribution.</b>	
Audit findings: <b>JFDC has developed an adjustment of harvest procedure based on area control. The adjustment has begun with the harvesting in 2004 and will continue until age class has been regulated. Actual harvested area in 2004 was lower than what was projected as part of the adjustment. Uniform distribution of age, area, volume and location will be merged over the next few years.</b>	
It is still not clear, as mentioned in CAR 23/04, that adjacency is considered when removing all of the overstory on such a large scale in a short period of time and it also doesn't appear that they comply with the national regulation on clearcut size.	
Non-compliance with CAR 6/05 could lead to a Major CAR and suspension of the certificate.	
Status: <b>Open</b>	
Follow-up Action (if applicable): <b>Immediately limit clearcutting to 20 ha as per national forestry regulations unless JFDC can prove that this regulation does not apply to them. Prepare a justification, based on, relevant monitoring and biologist recommendations concerning species habitat maintenance (see CAR 4/05), for the size of the clearcuts described in the management plan and timing of the harvesting of adjacent units.</b>	

#### 2.4 New corrective actions issued as a result of this audit

CAR #: <b>1/05</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	From CAR 8/04
Corrective Action Request: <b>A monitoring system will be operational for the monitoring of the impact the plantation has on the water availability.</b>	
Timeline for Compliance: <b>By the next annual audit</b>	

CAR #: <b>2/05</b>	Reference Standard #: <b>Criterion 5.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	From CAR 8/04
Corrective Action Request: <b>Results from the monitoring outlined in CAR 01/05 will be published.</b>	
Timeline for Compliance: <b>By the end of the third year of certification and each year thereafter</b>	

CAR #: <b>3/05</b>	Reference Standard #: <b>Criterion 6.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Although JFDC has developed a environmental impacts assessment, the staff does not completely understand how to use it
Corrective Action Request: <b>JFDC shall provide environmental assessment procedure training to relevant staff.</b>	

Timeline for Compliance: <b>By the next audit</b>
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CAR #: <b>4/05</b>	Reference Standard #: <b>Criterion 6.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	A scientific analysis of wildlife and RTE species in the area is lacking
Corrective Action Request: <b>A professional biologist must conduct on-site research to determine what terrestrial and aquatic plants and wildlife actually inhabit the plantation area and whether RTE species and/or their habitat exist within the plantation area. The research must include habitat requirements and protection measures for maintaining all species discovered.</b>	
Timeline for Compliance: <b>By the next audit</b>	

CAR #: <b>5/05</b>	Reference Standard #: <b>Criterion 6.5</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Roads are not engineered well enough to control surface erosion
Corrective Action Request: <b>Develop or obtain engineering specifications for road design and construction, including construction, maintenance and restoration of borrow pits. Train foresters to design appropriate roads and train tractor operators to build roads to specifications. Develop guidelines, with local community input, about the construction, use and restoration of borrow pits.</b>	
Timeline for Compliance: <b>By the next audit</b>	

CAR #: <b>6/05</b>	Reference Standard #: <b>1.1</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	National forestry regulations limit clearcutting to 20 ha; therefore JFDC is out of compliance with the regulation.
Corrective Action Request: <b>Limit clearcutting to 20 ha as per national forestry regulations or provide evidence that the JFDC's plantations are not subject to those regulations.</b>	
Timeline for Compliance: <b>Within three months</b>	

CAR #: <b>7/05</b>	Reference Standard #: <b>Criterion 10.2</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	Clearcuts are large and there is no explicit adjacency requirement, which may impact soils and wildlife.
Corrective Action Request: <b>Prepare a justification, based on relevant monitoring and biologist recommendations concerning species habitat maintenance (see CAR 4/05), for the size of the clearcuts described in the management plan and timing of the harvesting of adjacent units.</b>	
Timeline for Compliance: <b>By the next audit</b>	

CAR #: <b>8/05</b>	Reference Standard #: <b>8.3</b>
Non-compliance: Major <input type="checkbox"/> Minor <input checked="" type="checkbox"/>	JFDC does not have a complete CoC documented control system
Corrective Action Request: <b>JFDC must create a documented chain of custody product control system that includes provisions for 1) putting the FSC certification code on log shipping documents; 2) physically mark certified logs to distinguish them from non-certified; 3) get approval from SmartWood BEFORE using the FSC or SmartWood trademarks (logos) or using the FSC or SmartWood name in public information documents or websites.</b>	
Timeline for Compliance: <b>By the next audit</b>	

## 2.5 Audit observations

Observation	Reference Standard #
The biologist could be a government employee, university professor or graduate researcher.	6.2
Forest road engineering specification might be obtained from the Chinese Forestry Academy. There is also an organization called the Tropical Forest Foundation that does training in “Reduced Impact Logging (RIL)” . Information can be found at <a href="http://www.tropicalforestfoundation.org/">www.tropicalforestfoundation.org/</a>	6.5

## 2.6 Audit decision

Sino Forest and JFDC are clearly committed to meet their CARs and to maintain FSC certifiable plantation management. The audit team recommends that Sino-Forest Corporation and Gaoyao City Jiayao Forestry Development Company Limited retain their SmartWood/FSC certification.

## APPENDIX I: List of Visited Sites

District or FMU	C	Sub-compart	Auditors	Site description / Audit focus
Huilong	Liucun Village	World Bank planted JFDC planted forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• 2001 harvest. Understory vegetation not removed. Trees now 6 meters tall</li> <li>• 2004 harvest. Road construction and monitoring for sediment movement</li> <li>• 2003 harvest. Planted by JFDC in 1997</li> </ul>
Huilong	Qinghu Village	Ecological Garden Ecological Service Forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• Agriculture Ecological Garden. Botanical garden, owned by government. Neighbor to JFDC</li> <li>• Ecological Service Forest. Managed by Qinghu Village collective JFDC provides protection. Collective receives 120 RMB per ha for management.</li> </ul>
Huilong	Chentsu Village	Headquarters JFDC planted forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• Interviews with village representatives</li> <li>• Interview with fish pond owner</li> <li>• 2000 and 2002 eucalyptus planting</li> <li>• 2004 tending/fertilizing</li> </ul>
Huilong	Kuanjiao Village	JFDC planted forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• 2004 harvest</li> <li>• Areas where Village did not allow eucalyptus planting</li> </ul>
Baizhu	Shangkong Village	JFDC planted forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• 2004-05 harvest</li> <li>• Interview with citrus farmer adjacent to current harvest. ( He received payment and JFDC repaired road)</li> </ul>
	Xiapo Village	JFDC planted forest Research forest	Walter Smith Xu Bin	<ul style="list-style-type: none"> <li>• May and October 2004 Harvest. May harvest coppices are 3-4 meters tall and October harvest are 2 meters tall</li> <li>• JFDC Research projects</li> </ul>