

# Land Use at Cloudbridge and Vicinity

by Jessica Schwartz

"In the end, we will conserve only what we love, we will love only what we understand, we will understand only what we are taught."

Bada Dioum, Senegalese conservationist

## Objective 1: Identify current land use along the Rio Chirripo Pacifico

Land use is defined as:

Primary forest (1o) – undisturbed virgin forest,

Secondary forest (2o) – previously disturbed area that has regrown and developed a canopy.

Successional growth (SG) – previously disturbed area that has been allowed to regrow naturally (n) or has been planted (p), no canopy has developed.

Pasture (P) – active (a) or inactive (ia) grassland for cattle, horses, etc.

Agriculture (A) – cultivated land for commercial production, either shaded (s) or unshaded (us).

Residential (R) – area with one or more houses, buildings, including private gardens (g).

Non-residential (NR) – area with one or more buildings used for non-residential purposes such as a restaurant, hotel, school.

Methods:

The first data point will be Water Monitoring Site #1 at the edge of the Chirripo National Park, and the last will be at Water Monitoring Site #9 at the edge of Chimerol. Data points will be at 100-meter intervals along both North and South sides of the River, and approximately 100 meters from the waters edge to take into account the 50-meter riparian zone. It should be noted if this undisturbed zone is not present.

At each data point the following information should be recorded:

Latitude/Longitude and Elevation using a GPS unit. (Elevation should only be recorded if there are 3 satellites available.)

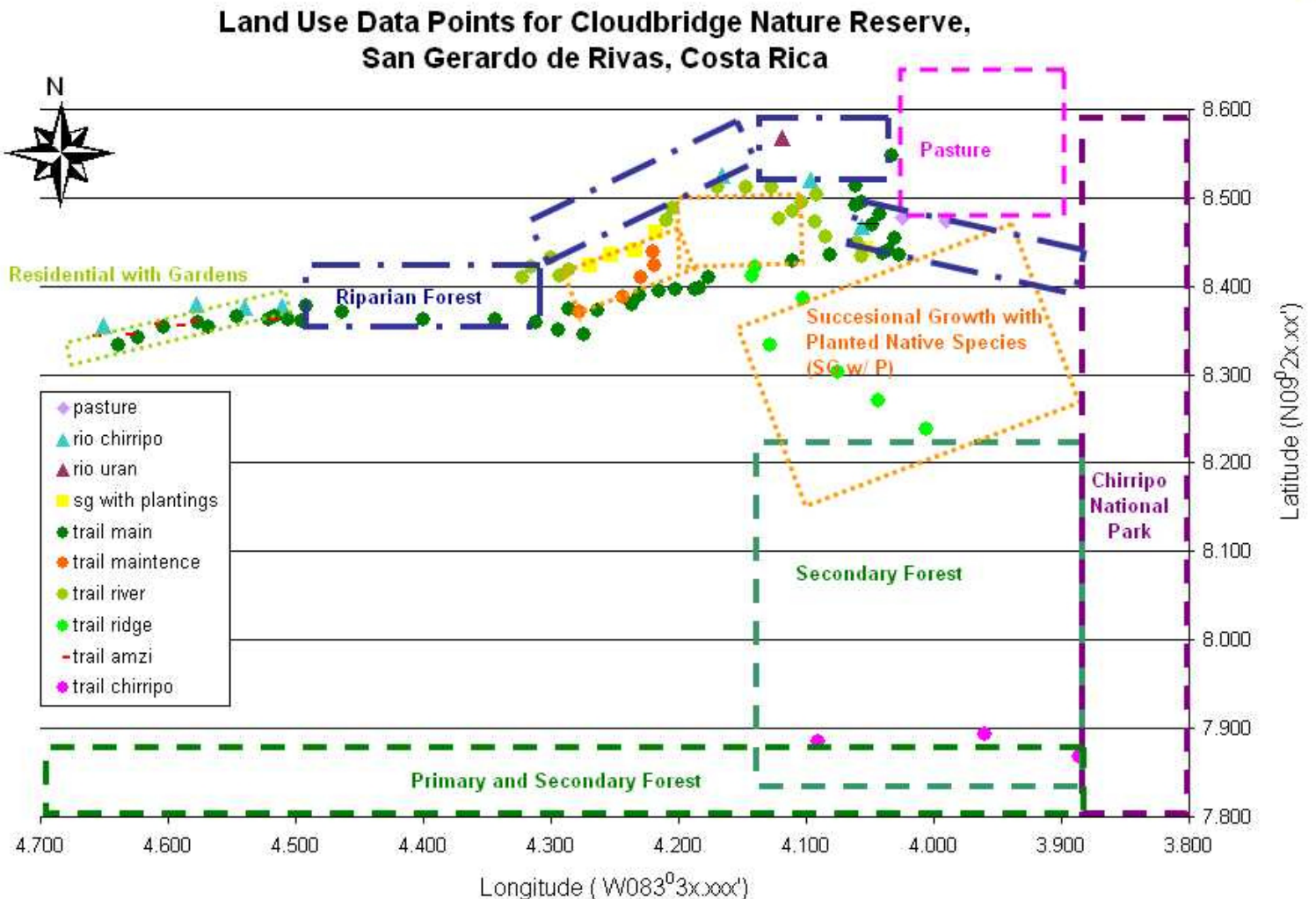
Land Use type (see definitions above), use capitalized abbreviations in parenthesis for land use and lowercase abbreviations for comments.

See Appendix A.

## Objective 2: Map current land use along the Rio Chirripo Pacifico.

In the absence of GIS or a coordinate mapping program use a graphics program to illustrate the distribution of the seven recorded land use types. This should be overlaid on a topographic map of the area. If possible outline property boundaries and borders of land use type.

Initial results



## Objective 3: Interview landowners for detailed information about land use along the Rio Chirripo Pacifico.

The interview should cover these topics; history and general information, land use specifics for each type present, wildlife populations and construction activity.

History and General Information

How long has this property been in your ownership? Who were the previous owners?

How many acres do you own that border the river?

Land Use

Questions should be asked according to the type of land use that has been identified for their property.

Primary Forest – Can you confirm that it is primary, undisturbed forest? Do you have plans to conserve this area? Have trees ever been harvested?

Secondary Forest – When was the last time this land was used? Was it used for agriculture or pasture? Do you have plans for it or will it continue to regrow undisturbed?

Sucesional Growth – When was the last time this land was used? Was it used for agriculture or pasture? Do you have plans for it or will it continue to regrow undisturbed?

Pasture – How long has this been a pasture? How often is it grazed and by how many cattle? Do you have plans to use it for agriculture or will it remain as pasture?

Agriculture – Is it currently organic? When was the last time that it was organic? How long has it been under cultivation? What type of vegetation was here before it was cleared for crops? What types of plants are grown? Do you rotate the types of plants grown? Do you have problems with pests? Which types of pests? What do you do to solve the pest problem? Do you have plans to maintain this field as agricultural or will it be allowed regrow or go to pasture?

Residential – How long have you lived here? Do you have a garden? Is your garden organic? Do you have pets like chickens, dogs or cats? Do you have a septic system? Where do you dispose of trash? Is your water source from the river or from a well?

Non-residential – How long has this property been in use? Do you have a septic system? Where do you dispose of trash? Is your water source from the river or from a well?

#### Wildlife

Do you see wildlife on your property? What types and how often?

#### Construction

Do you have any roads or trails on the property? How many, how extensive are they? When were they built? Do you have problems with erosion on the roads or trails? Have there been any major construction projects on your property?

Objective 4: Compare results from the water monitoring study to land use types along the Rio Chirripo Pacifico.

Is there any correlation between fecal oviform levels and pasture areas?

Is there any correlation between nitrate and phosphate levels and residential/agricultural areas?

Is there any correlation between turbidity and sucesional growth or pasture/agricultural areas?

Are there specific pollution sources that can be identified? Is there any water quality difference between areas with intact riparian vegetation and those without?

**APPENDIX A**

Data Point	Latitude (N)	Longitude (W)	Elevation (km)	Accuracy (m)	N/S Rio Chirripo	Data Location	Comments
1	09.28.475	83.33.991	1.74	8	N	p	rock at edge of rip zone and pasture, top border with park, waterfall visible from above, approximately parallel to park
2	09.28.478	83.34.025	1.71	6	N	p	barbed wire fence in lower corner at bottom of pasture, rip
3	09.28.468	83.34.056	1.68	7	mid river	rc	midpoint of river just downstream from covered bridge, taken
4	09.28.481	83.34.042	1.7	5	N	tm	runs straight line from 001 and 002, marks entrance to bridge and property boundary with Cloudbridge, right of way to clldbridge north, taken from top of gate, rip zone not intact due
5	09.28.491	83.34.061	1.69	4	N	tm	trail follows river as it curves to the north, this marks a slight drop in elevation and a more N direction. Makes a border with sucesional pasture that starts just over barbed wire fence at
6	09.28.514	83.34.061	1.67	13	N	tm	marks trail path, at edge of rip zone which falls down to river, border of sg land, low accuracy.
7	09.28.568	83.34.119	1.69	12	N	ru	Rio Uran, mid river point, just below the suspension bridge, the trail from 006 follows the Chirripo and then crosses the Rio uran, besides the trail the entire area between 006 and 007 is
8	09.28.494	83.34.056	1.7	11	N	tm	on trail midpoint btw 004 and 005 fills in curve of trail, rip
9	09.28.547	83.34.033	1.75	5	N	te	intersection of pasture, sg, and rip, swarming biting bees
10	09.28.602	83.34.009	1.77	9	N	te	at small stream, borders pasture above, rip zone below, saw a hawk, walked further along path but could not get to Rio Uran.
11	09.28.469	83.34.048	1.7	8	S	tm	South side of covered bridge, rip zone broken for trail, intact
12	09.28.454	83.34.031	1.71	14	S	tm	trail point further east of bridge, all rip zone
13	09.28.441	83.34.035	1.72	5	S	tm	further uphill along trail, veg has not changed, trail zig zags
14	09.28.436	83.34.027	1.73	6	S	tm	further uphill along trail, rip on all sides, at entrance to SE river
15	09.28.437	83.34.040	1.74	6	S	tm	rip edge, above is pasture, below and to the east is rip zone
16	09.28.434	83.34.056	1.74	7	S	tr	gate at river trail, pasture above, sg with planted trees
17	09.28.436	83.34.081	1.74	15	S	tm	path along main trail below is plantation, above is pasture,
18	09.28.429	83.34.110	1.74	7	S	tm	main trail below is plantation, above is pasture, larger cypruss
19	09.28.422	83.34.140	1.74	13	S	trd	at entrance to ridge trail, plantation below, sucesional above
20	09.28.442	83.34.053	1.73	7	S	sgp	in plantation, at edge of rip zone, fence to entrance of trail is visible. Drops off sharply below this point
21	09.28.448	83.34.060	1.73	7	S	tr	further along river trail, exactly at rip edge, cypruss is visible

<b>22</b>	09.28.455	83.34.085	1.73	14	S	tr	further along river trail, exactly at rip edge, 2nd cypress is visible
<b>23</b>	09.28.472	83.34.093	1.73	10	S	tr	on river trail, rip zone thinner, still sheer drop, point lines up with tree #507 MZ, and with 2 dead stumps uphill
<b>24</b>	09.28.476	83.34.121	1.72	5	S	tr	entrance to ridge trail is visible with cecropia in line, on spot just before trail drops into rip zone
<b>25</b>	09.28.409	83.34.176	1.74	5	S	tm	at nursery hut below is plantation, on main trail
<b>26</b>	09.28.396	83.34.187	1.73	8	S	tm	on main trail at bend past hut, where do plantings stop?
<b>27</b>	09.28.397	83.34.202	1.73	11	S	tm	on main trail looks like plantings have stopped, sg below mostly
<b>28</b>	09.28.526	83.34.166	1.67	12	mid river	rc	confluence of Rio Uran and Rio Chirripo
<b>29</b>	09.28.488	83.34.205	1.68	9	S	tr	edge of rip zone on river trail, sg with plantings above
<b>30</b>	09.28.475	83.34.210	1.67	6	S	tr	edge of rip zone on river trail, sg with plantings above
<b>31</b>	09.28.461	83.34.218	1.67	7	S	sgp	no longer on river trail, following thin rip zone, plantings
<b>32</b>	09.28.441	83.34.234	1.66	7	S	sgp	off river trail, following rip zone, lots of plantings mostly grass
<b>33</b>	09.28.435	83.34.253	1.66	8	S	sgp	off trail, at a edge of rip zone, sg plantings, cloudbridge falls
<b>34</b>	09.28.423	83.34.270	1.65	9	S	sgp	off trail at rip edge, sg plantings, scattered larger trees
<b>35</b>	09.28.412	83.34.293	1.57	10	S	tr	trail switches back towards river opens into sg meadow no
<b>36</b>	09.28.418	83.34.286	1.57	13	S	tr	continued switchback close to river at exit of private trail, 1st bench visible, amazing view of falls 2 ft away
<b>37</b>	09.28.410	83.34.322	1.64	10	S	tr	end of river trail before it switches into rip zone and climbs,
<b>38</b>	09.28.421	83.34.315	1.64	6	S	tr	following trail east, edge of rip zone and meadow
<b>39</b>	09.28.431	83.34.300	1.64	4	S	tr	closest point to 036, edge of rip zone and meadow, on trail
<b>40</b>	09.28.438	83.34.220	1.67	4	S	tmn	between 030 and 031 on entrance to maintenance trail
<b>41</b>	09.28.424	83.34.219	1.68	5	S	tmn	on maintenance trail, plantings on all sides
<b>42</b>	09.28.409	83.34.229	1.68	5	S	tmn	on maintenance trail, plantings on all sides, not that steep, short
<b>43</b>	09.28.388	83.34.243	1.69	7	S	tmn	on maintenance trail, steepness increases, plantings above and
<b>44</b>	09.28.370	83.34.278	1.69	6	S	tmn	at intersection of maintenance trail and main trail
<b>45</b>	09.28.485	83.34.110	1.72	8	S	tr	on river trail after switchback, surrounded by sg with large
<b>46</b>	09.28.494	83.34.104	1.71	6	S	tr	at edge of rip zone and sg plantings on trail
<b>47</b>	09.28.503	83.34.092	1.7	7	S	tr	at edge of rip zone on river trail, really close to river
<b>48</b>	09.28.511	83.34.127	1.69	9	S	tr	at edge of rip zone and sg plantings, middle of trail, recorded data, unmarked in gps b/c of lost signal, 049 data points for 048
<b>49</b>	09.28.511	83.34.147	1.69	6	S	tr	on trail at viewpoint of confluence and edge of sg plantings.
<b>50</b>	09.28.512	83.34.170	1.68	6	S	tr	right at watersedge on river trail sg above
<b>51</b>	09.28.239	83.34.006	1.93	7	S	trd	ridge trail at forest edge

52	09.28.271	83.34.043	1.9	6	S	trd	ridge trail about 100m downhill at old fence line
53	09.28.303	83.34.075	1.88	4	S	trd	ridge trail about 200 m downhill
54	09.28.334	83.34.128	1.82	5	S	trd	ridge trail at poro/bench
55	09.28.386	83.34.102	1.76	6	S	trd	ridge trail at riparian oasis
56	09.28.412	83.34.142	1.74	5	S	trd	bottom of ridge trail
57	09.28.374	83.34.286	1.7	6	S	tm	on main trail just west of maintenance trail, at eastern border of
58	09.28.345	83.34.274	1.67	11	S	tm	main trail at stream
59	09.28.351	83.34.294	1.69	6	S	tm	main trail, gully to West of stream on south side of trail, riparian
60	09.28.359	83.34.312	1.71	7	S	tm	main trail, W of stream and gully, at W corner of rip zone. Riparian N and E of trail. Pasture/sg to S.
61	09.28.363	83.34.343	1.69	8	S	tm	main trail at bench, river trail exit
62	09.28.363	83.34.400	1.65	8	S	tm	main trail at strangler fig, mature forest N of trail, younger
63	09.28.365	83.34.516	1.62	7	S	tm	main trail E end of Amanzimtoti, with sg and garden, sg young
64	09.28.354	83.34.568	1.59	7	S	tm	main trail early sg with plantings to N, early sg without plantings
65	09.28.353	83.34.603	1.55	10	S	tm	main trail at pacifica gate, pasture above, gardens below
66	09.28.358	83.34.576	1.56	10	S	tm	main trail ~100 m further East, SG above, possible pasture,
67	09.28.366	83.34.546	1.57	9	S	tm	main trail ~100 m further East, SG above, gardens below at
68	09.28.363	83.34.521	1.59	9	S	tm	main trail gardens below 2ndary forest above
69	09.28.362	83.34.506	1.6	7	S	tm	main trail 2ndary above and below
70	09.28.361	83.34.495	1.61	11	S	tm	main trail 2ndary above, rip zone below
71	09.28.370	83.34.464	1.61	10	S	tm	on main trail rip zone below 2ndary above pacifica falls below
72	09.28.342	83.34.623	1.6	7	S	tm	on main trail west of pacifica falls gate
73	09.28.333	83.34.639	1.59	7	S	tm	on main trail west of pacifica falls, on small bridge before casa
74	09.28.376	83.34.540	1.58	11	S	rc	about 10 m above the river on the am trail ,decreased elevation by 10 m, pt on river, all sg no plantings
75	09.28.380	83.34.578	1.58	7	S	rc	about 10 m above water at pacifica falls, changed elevation < 10
76	09.28.361	83.34.582	1.59	8	S	tamz	on pacificia falls trail at sign rip below sg plantings above
77	09.28.356	83.34.593	1.58	7	S	tamz	at pacifica trail at sign rip below sg plantings above
78	09.28.357	83.34.611	1.58	5	S	tamz	on pac trail rip below, 2ndary Sg plantings fruit trees above
79	09.28.345	83.34.633	1.57	6	S	tamz	on pc trail at pond rip below sg disturbed pond above, gardens
80	09.28.344	83.34.659	1.56	5	S	tamz	sitting on big rocks border for sg and house/gardens
81	09.28.355	83.34.651	1.54	12	S	rc	on rio chirrippo close to house , privada trail
82	09.27.868	83.33.886	2.16	5	S	tchirrippo	border of chirrippo park and cloudbridge
83	09.27.893	83.33.960	2.15	6	S	tchirrippo	end of cloudbridge ridge trail, at chirrippo trail

<b>84</b>	09.27.885	83.34.091	2.14	9	S	tchripo	cloudbridge property boundry, west on chirripo trail
<b>85</b>	09.28.372	83.34.264	1.71	4	S	tm	on main trail east of tmn towards vivero
<b>86</b>	09.28.379	83.34.237	1.71	10	S	tm	on main trail east of tmn towards vivero
<b>87</b>	09.28.389	83.34.231	1.71	14	S	tm	on main trail east of tmn towards vivero
<b>88</b>	09.28.394	83.34.215	1.72	4	S	tm	on main trail east of tmn towards vivero
<b>89</b>	09.28.398	83.34.183	1.72	15	S	tm	on main trail east of tmn closest point to vivero in low curve of
<b>90</b>	09.28.377	83.34.511	1.57	11	S	rc	on amz trail at river curve and butterfly sign, river about 12 m below, corrected for data point
<b>91</b>	09.28.363	83.34.521	1.65	11	S	tamz	on amz trail where it switches back into rip zone and moves
<b>92</b>	09.28.377	83.34.492	1.63	14	S	tm	on main trail where amz trail meets it, all rip zone
<b>93</b>	09.28.521	83.34.096	1.69	10	S	rc	on river off main trail inbetween covered and suspension bridge