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INFORME: LUKURMATA

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Introduction

Flotation samples were recovered from several parts of the site of Lukurmata during the 1986 and 1987 field seasons. Contexts sampled include habitation areas, the temple complex, and burials.

The strategy selected for our first phase of paleoethnobotanical analysis has been threefold: 1) to analyze at least some samples from all areas, 2) to focus on domestic areas, and 3) to work only with samples where information concerning cultural contexts, field notes, etc., were available. At the close of the 1989 field season we finished flotation of all available Lukurmata samples (approximately 223) which were then returned to the US. Because Lukurmata was one of the first areas we worked on in the lab, a large proportion of the samples were analyzed--a total of 140 or 63%.

As noted above, we tried to focus on the most informative materials, and did not complete many samples from the fill of the temple. Of the 140 samples completed 37 do not yet have secure cultural contexts, 8 are from ash deposits, 14 are from burials, 3 are from fill, 10 are from hearths, 7 are from midden, 12 are from occupation zones or surfaces, 3 are from offerings, 5 are from pits (non-trash pits), 16 are from trash pits, and 5 are from the inside of ceramic vessels. Time periods have not been separated, but it appears that the bulk of the samples examined date to the height of the Tiwanaku Empire. We did not focus on the later materials from K. Wise's area.

Individual sample size (site matrix prior to flotation) was small and varied somewhat. The mean number of liters per sample is 1.5, with a median of 1.6 and a range from 0.3 to 4.4 l. This disparity in sample size may cause distortion in some quantification schemes, as apparent differences may simply be a function of small and irregular sample sizes. Further, comparisons between this material and samples from the Tiwanaku habitation areas are difficult, as the latter averaged between 5 and 7 liters. For these reasons quantifications must be examined carefully, and DENSITIES are known to be more reliable than UBIQUITIES (Lennstrom 1991).

Methods

Field methods

Botanical samples were processed using a motorized flotation system, modified from the SMAP machine design first published by Watson in 1976. Because the charred materials have a lower specific gravity than water, they float on the water's surface and can be poured off. Our machine is built from a a 55 gallon oil drum as a water container, that is used to separate charred plant remains from the site matrix. Water is pumped into the system from below, and is moved upward in the drum by a submerged shower head. Inside the drum is a removable inner bucket, with a mesh bottom that the soil samples are poured into once it is partially submerged in the machine. The bottom mesh catches rocks, artifacts, and bones that do not float. This material that is caught is termed the "heavy fraction". It is dried, and the cultural material larger than 2 mm is removed and analyzed. In 1989 we used brass cloth in the bottom of the inner bucket, with an aperture of 0.5mm.

The charred plant remains on the surface of the water are poured off through a spout into fine-meshed chiffon. This material, termed the "light fraction", was allowed to dry, and then packaged for shipment to the University of Minnesota's archaeobotany laboratory.

Approximately 20 samples were processed per day. Each day we added 50 charred poppy seeds to a randomly selected sample to act as a check on the flot machine (see Wagner 1982, 1988). Poppy seeds are used in the Americas because they are not native (and hence will never occur in prehistoric deposits), and they are small in size (ca. 0.4 x 0.6mm). These features allow poppy seeds to act as a measure of the amount of small seeds that are lost or recovered. The average recovery rate for 1989-90 was 93.4% (46.7), indicating that most material from the samples was being recovered.

Laboratory methods

Analysis of the charred plant remains from the light fraction started with removing carbon, bones, and fish scales from the floted matrix (mainly modern plant roots and soil). Lab analysis was done using low power (6-25X) stereoscopic microscopes with fiber optic light sources. Trained lab personnel extracted the charred plant remains from the samples, and made some preliminary identifications of plant taxa. H. Lennstrom checked all charred material removed from the samples and also scanned the remaining matrix for any identifiable plant parts that might have been missed. In addition she was responsible for the final identifications made of the charred plant parts. The identifications were made with the aid of Dr. Hastorf's South American reference collection of seeds, pressed plants, tubers, and wood in the lab. Material from each flot was examined two times, systematically, under the microscope. For ease of sorting, the samples were split using 2mm, 1.18mm, 0.5mm, and 0.3mm geologic sieves, keeping materials of the same size together in a separate tray. All charred material greater than 2 mm was pulled and identified, while wood was not removed from the <2 mm portion of the light fraction, as it is known to be too small for identification purposes (Asch and Asch 1975). Other plant material down to 300 microns was collected and identified. In some cases, when charred plant remains were particularly dense, it was not possible nor necessary to examine the entire sample. We used experimental results from Lennstrom's (1992) work with Peruvian flot samples which found that a 10-25% sub-sample could be used to represent the sample as a whole, if the sample contained several thousand plant fragments and had a total volume of over 0.5 liter of charred botanical remains. Samples were split using a riffle box, so that the sub-samples were divided without bias (Pearsall 1989).

Each sample was recorded on a data sheet, containing information on its provenience, type of sample, cultural context, volume of flot sample, amount of sample analyzed, counts of all the plant taxa that could be identified, and counts of those items that could not be identified. For recording, counts were chosen over weights as some of the seed taxa are very small, and their weights are negligible. Seed fragments and whole seeds were recorded by count. Material from the heavy fractions was identified in the same manner, and tallied on the same data sheet as the light fraction.

Information was transferred from the data sheets into data files on floppy disks that were then loaded onto the mainframe computer. The mainframe used is an IBM 4381 available at the University of Minnesota's St. Paul computer center. Data analysis was carried out using the SAS statistical package (SAS Institute 1985a; 1985b; 1985c; 1985d). This system was chosen for several reasons. First, it had the capability of managing a very large dataset, and provided the types of summary, parametric, and non-parametric statistics which were of interest.

Also, it had an attached graphics package that allowed the plotting of publication quality graphics, without having to transfer data to another system.

Sorting strategies for archaeobotanical material in the lab

Because time and money are always in high demand in the lab there are several different strategies that can be used when sorting and identifying archaeobotanical material to maximize data collection while minimizing time expended. Other considerations are the goals of the study at hand, the quality of the collection and recovery techniques used to retrieve botanical material, and the overall quality of archaeological information available for the interpretation of the materials.

Below are sorting schemes devised especially for flotation samples, where the study of domesticates is the main focus.

Strategy 1: Complete sort

In the best of all possible worlds it is nice to be able to sort out and identify all prehistoric material from a sample. It is especially desirable because a single flot sample is already only a small sample of any given archaeological context, and one wants as complete a picture as possible. In our case, one would sort out, and identify all charred material, except <2mm wood, which is usually unidentifiable. All bones and other animal and artifactual materials are pulled out and given to appropriate specialists.

This type of strategy gives RATIO level data, with exact counts (and/or weights) entered onto the computer. Descriptive statistics such as RELATIVE PERCENTAGES, DENSITIES, UBIQUITIES, and DIVERSITIES can be generated from this type of data.

This strategy is the most labor intensive, and can be redundant when you work past the point of diminishing returns, ie, you get the exact same values by sorting entire sample that you would by making estimates based on some fraction of the whole (50%, 25%, etc).

Strategy 2: Sample splitting

In this strategy time is saved by splitting (by weight) some or all of the sample. It is usually done to one of the smaller fractions separated by the geologic sieves, eg, 100% of the material that is >2mm is sorted, while 50% of all material <2mm is sorted and all counts of the identified specimens are doubled. The decision to split a sample should be based on the following guidelines. The average amount of time spent on a sample is about 2 1/2 hours, including sorting and identifying light and heavy fractions, as well as material recovered from the sieves in the field. The two main factors that are considered are both the volume of the charred material, and the density of the seeds. The desired amount of material to be sorted from each size fraction of the sample is enough to fill one of the sorting trays (in a thin layer, as when ready for sorting). If a brief scan of even this amount appears to contain hundreds of seeds, it should be split again. A rule of thumb that has proven effective for the 1986 Pancán (Perú) material was never to let the sorted portion fall below 1.0g or 12.5% (Lennstrom 1992). In these samples it was found that this was approximately the point of diminishing returns for very dense samples such as those from burnt stores of crops, where seeds and tuber densities per 6-liter of soil averaged in the thousands. That is, if at least these 12.5% or 1.0g of each size fraction was sorted the estimates of total densities and taxa diversity were found to be insignificantly different than if the whole sample had be sorted. We noted on the form which fractions were split, what percentage was sorted, and the weight of the material prior to sorting. Of course, special circumstances may occur, and less may be sorted without losing accuracy.

Trials with a 0.3mm geologic sieve show that very few seeds will pass through this mesh size. Another time saving measure in dusty samples is not to sort the material that is less than 0.3mm. If bones and fish scales are too numerous, they can be left in the remains while noting their occurrence and/or abundance can be put on the data sheet. If very small lumps are overabundant one can leave those <1.18mm (with no distinctive characteristics, such as a surface) in the remains.

As with the complete sort, one gets RATIO level data, and can generate RELATIVE PERCENTAGES, DENSITIES, UBIQUITIES, and DIVERSITIES. Because actual counts are estimated this type of data can be used in comparison with that of Strategy 1 with no conversion.

This method is a good time saver, especially for samples that are quite homogeneous. Drawbacks are that diversity may be lost, and rare species are either missed or over represented.

[Other sorting strategies have been designed, including a switch to examining only the material that is >0.5mm, (see Lennstrom and Hastorf 1989), but these were not used with the Lukurmata samples.]

<u>Quantification of Lukurmata samples</u>

In this section we report the different plant taxa recovered from the samples and three different quantification schemes used to help interpret the botanical remain (DENSITY, UBIQUITY, and RELATIVE PERCENTAGES). Density is expressed as the number of seeds (or seed fragments) per liter of site matrix. This standardizes the counts of material, so that samples of differing original volume can be compared (Pearsall 1989; Popper 1988). Also, each taxon can be considered independently, and density values seem least biased when comparing samples of different original soil volume (see Lennstrom 1991).

Ubiquity is expressed as a percentage, and is calculated as the percentage of samples which contain each taxon (Hubbard 1975; Popper 1988). For example, if maize is identified in 10 of 30 samples it has a ubiquity value of 33%. The advantage of ubiquity scores is that each taxon is considered separately, and the amount of each does not affect the others. Also, the amount of each taxon in a sample does not affect the ubiquity value, so that 1 or 1000 of the same seed in a single sample carries the same weight.

The third quantification method we present is relative percentage (Popper 1988). These values are expressed as the percentage each taxon makes up relative to the number of items in an individual sample, and is displayed as a pie diagram. The advantage of this scheme is that all taxa can be considered simultaneously, and the relative proportions of taxa from different samples can be compared, regardless of the original volume of the sample, or the density of charred plant remains.

List of plant taxa:

Plant remains from the Wila Jawira botanical samples were commonly identified to the family level, and sometimes to genus. When referring to plants by scientific names authorities (initials) are usually cited when the taxon is first mentioned in the text. For example *Zea mays* L. indicates that Linnaeus named the species (for complete list see appendix) Genera (eg: *Chenopodium*) are always capitalized, and underlined, or italicized. The second part of the species name is also put in italics, or underlined, but is always lower case

(*Chenopodium quinoa*). The addition of "spp." following the genus name indicates that it might be represent by one or more species, but we cannot determine which one(s). When two species from the same genus are referred to in succession the genus is usually abbreviated to a single letter for the second species.

Large (>1.18mm) *Chenopodium* spp. (seeds) Probably domesticates: either quinoa (*Chenopodium quinoa*) or cañiwa (*C. pallidicaule*). Food source.
Small (<1.18mm) *Chenopodium* spp. (seeds) Possibly domesticates: either quinoa (*Chenopodium quinoa*) or cañiwa (*C. pallidicaule*). Food source.
Lumps (Unidentifiable charred plant fragments, these might be tubers or other fragments of domesticates.) Possible food source.
Small Poaceae (seeds) Grass family. Possibly used as fodder, fuel, or in construction. May also be derived from dung.
Large Poaceae (seeds) Grass Family, likely *Stipa* spp. or *Festuca* spp. Possibly used as fodder, fuel, or in construction.
Wild Leguminosae (seeds) Fabaceae-Bean family. Common weed, possible fodder, possibly derived from dung.
Scirpus sp. (seeds) Tortora. Used as food, fuel, fodder, construction material. Grows in and around water.
Verbena spp. (seeds). Common weed.
Medium Poaceae (seeds). Grass familty. Possibly used as fodder, fuel, or in construction.
Malvaceae (seeds) Mallow family. Common weed. Also found in dung.
Relbunium spp. (seeds) A plant used in S. America for red dye.
Rubus spp. (seeds) Some types could have been used as a casual food source, or as medicines.
Cyperaceae (seeds) Sedge family, often associated with wetlands. Many industrial purposes: mats, boats, roofing, etc.
Cruciferae (seeds)- Mustard family (Brassicaceae), common weed in disturbed areas.
Unknown 224 (seeds). Possibly mint family
Potamogeton spp. Pondweed, wetland plant.
Cereus spp. a type of cactus.
Unknown 264 (seeds)
Amaranthus spp. (seeds) Usually a weedy annual; found in disturbed habitats, possible casual food source.
Unknown 270 (seeds)
Unknown 242 (seeds)
Compositae (seeds). Sunflower family
Kaiña (seeds). This is an Aymara name, scientific name unknown.
Unknown 265 (seeds)
Unknown 261 (seeds)
Juncus (seeds). Common water plant. Useful in construction of matting, etc.
Caryophyllaceae (seeds) Pink family
Unknown 266 (seeds)
Solanaceae (seeds) Nightshade family
Nicotiana spp. (seeds) These are likely of a type of tobacco which grows wild/feral in the area today, though we cannot distinguish them from more tropical domesticated species at this time.
Sisyrinchium (seeds)

Zea mays (maize) kernels and cupules (cob fragments)
Capsicum (seeds) Chile pepper. Probably grow in a lower area.
Domesticated Leguminosae (seeds) Beans or Tarwi
Polygonaceae (seeds) Knotweed family.
Oxalis (seeds).
Unknown 202 (seeds) Possibly Borage family (Boraginaceae)
Oenothera (seeds) Evening primrose.
Unknown 271 (seeds).
Unknown 235 (seeds).
Unknown 201 (seeds).
Wheat/Barley (seeds). Introduced by Spanish, found in one sample.
Unidentifiable seeds
Tubers, (food) probably domesticated species, such as the potato
Wood and twig fragments-Fuel, construction, tools.
Leaves-Type unknown.
Dung-Fertilizer and/or fuel.

Densities, Ubiquity scores, and Relative proportions:

On the following page the average DENSITIES and UBIQUITY values are given for Lukurmata. On the top half of each table Lukurmata (LKM) is shown along with other Tiwanaku Valley sites (eg: Tiwanaku=TIW). In the second portion the Lukurmata samples are split according to general context categories. The ubiquity scores are read as follows: (for example) for LKM the allmaize (kernels and cupules together) the score is 0.13 this translates to 13% of all samples from Lukurmata contain maize remains.

On the pages following the tables of ubiquity and density values are pie-diagrams which express the RELATIVE PERCENTAGES of taxa within each of the contexts represented at Lukurmata. In the context diagrams the "n" is the number of flot samples that went into the diagram. Caution must be used when comparing digrams with highly disparate "n" values, as increasing numbers of samples elevate the total seed counts which nearly always increase the diversity of the chart contents.

<u>Interpretation of Lukurmata samples</u>

The botanical remains from Lukurmata are not nearly as "patternless" as first thought (see Wright and Lennstrom 1990). Now that a larger number of samples from this and other sites are finished we can begin to put Lukurmata into perspective.

Charred plant remains from the sites in the Titicaca Basin are plentiful and can provide insights into the environment and the use of plants in the region. Lukurmata samples had an average of 460 plant specimens, with a median value of 146 and a range of 0 to 5096 specimens/sample.

Lukurmata contains a wide variety of wild and domesticated plant taxa. All of the major domesticate groups were recovered from the site, including maize, *Chenopodium* (likely *C. pallidicaule*, cañiwa), tubers, legumes, and chile peppers. Weeds are numerous, especially grasses and mallows which are common on the Altiplano today. Many of the weeds are common in disturbed habitats and may indicate the disturbance caused by widespread cultivation of land during the reign of the Tiwanaku empire.

The types of plants recovered from Lukurmata can still be seen as *generally* very similar to the other sites in the area, as noted in our earlier reports. Yet in detailed analysis, which has only recently begun, there are subtle differences which can help define unique characteristics about this site. In

AVERAGE UBIQUITY

SITE	CUADRA	CONTEXT	_FREQ_	ALLMAIZE	KERNELS	COBS	LCHENO	SCHENO	TUBER	LEGUME	WOOD	GRASS	LUMPS	DUNG	MALLOW
ALL			11	0.00	0.00	0.00	0.27	1.00	0.00	0.00	0.36	1.00	0.82	0.00	0.91
GUA			14	0.14	0.14	0.00	0.29	0.79	0.00	0.00	0.71	0.86	0.71	0.29	0.43
IWA			10	0.00	0.00	0.00	0.30	0.90	0.00	0.00	0.30	0.70	0.60	0.30	0.60
LKM			140	0.13	0.10	0.05	0.49	0.83	0.02	0.01	0.67	0.82	0.88	0.49	0.64
OBS			12	0.00	0.00	0.00	0.17	0.92	0.25	0.00	0.58	0.83	0.75	0.25	0.67
PUK			6	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.50	0.17	0.00	0.17
TIW			380	0.31	0.20	0.17	0.54	0.96	0.08	0.01	0.87	0.96	0.85	0.37	0.82
TMV			27	0.04	0.04	0.00	0.56	0.96	0.04	0.00	0.70	0.96	0.74	0.19	0.78
LKM			37	0.19	0.16	0.05	0.46	0.89	0.03	0.00	0.78	0.86	0.89	0.57	0.68
LKM		ASHDEPOSIT	8	0.38	0.38	0.00	0.75	1.00	0.13	0.00	0.88	1.00	1.00	1.00	0.88
LKM		BURIAL	14	0.00	0.00	0.00	0.14	0.50	0.00	0.00	0.43	0.36	0.71	0.14	0.07
LKM		FILL	3	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.33	0.33	0.33	0.00	0.33
LKM		HEARTH	10	0.10	0.00	0.10	0.60	0.90	0.00	0.00	0.50	1.00	0.90	0.60	0.80
LKM		MIDDEN	7	0.00	0.00	0.00	0.71	0.71	0.00	0.00	0.71	0.71	0.71	0.57	0.71
LKM		OCCUPATION	12	0.25	0.25	0.08	0.50	0.83	0.00	0.00	0.75	0.83	0.92	0.33	0.58
LKM		OFRENDA	3	0.33	0.00	0.33	1.00	1.00	0.33	0.00	1.00	1.00	1.00	0.33	1.00
LKM		PIT	5	0.20	0.20	0.20	1.00	1.00	0.00	0.20	1.00	1.00	1.00	0.80	0.80
LKM		POTFILL	5	0.00	0.00	0.00	0.20	0.80	0.00	0.00	0.40	0.80	1.00	0.40	0.40
LKM		TRASHPIT	16	0.13	0.06	0.06	0.25	0.81	0.00	0.00	0.50	0.81	0.88	0.31	0.69

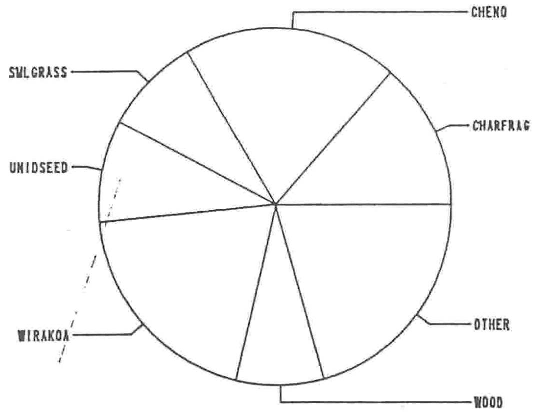
AVERAGE DENSITY

SITE	CUADRA	CONTEXT	_FREQ_	ALLMAIZE	KERNELS	COBS	LCHENO	SCHENO	TUBER	LEGUME	WOOD	GRASS	LUMPS	DUNG	MALLOW
ALL			11	0.00	0.00	0.00	0.13	3.04	0.00	0.00	0.07	1.54	0.40	0.00	0.58
GUA			14	0.90	0.90	0.00	0.73	9.36	0.00	0.00	7.58	5.65	3.41	3.46	0.57
IWA			10	0.00	0.00	0.00	0.29	4.04	0.00	0.00	0.52	4.07	2.25	0.40	1.09
LKM			140	0.23	0.16	0.08	2.78	58.60	0.03	0.00	14.14	70.05	28.79	23.17	10.33
OBS			12	0.00	0.00	0.00	0.18	49.01	0.13	0.00	1.64	19.59	5.16	0.62	1.04
PUK			6	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	1.16	0.16	0.00	0.16
TIW			380	0.36	0.20	0.16	1.05	17.83	0.07	0.00	6.66	22.64	8.07	14.61	3.36
TMV			27	0.02	0.02	0.00	0.69	164.02	0.02	0.00	0.78	9.63	3.58	0.52	1.91
LKM			37	0.25	0.22	0.03	2.01	45.83	0.05	0.00	9.01	53.83	32.61	47.00	13.63
LKM		ASHDEPOSIT	8	0.71	0.71	0.00	9.82	150.00	0.16	0.00	11.69	280.36	49.34	35.43	12.57
LKM		BURIAL	14	0.00	0.00	0.00	0.42	5.73	0.00	0.00	2.20	3.29	5.26	0.27	0.55
LKM		FILL	3	0.00	0.00	0.00	0.63	4.38	0.00	0.00	3.13	7.71	7.29	0.00	0.63
LKM		HEARTH	10	0.06	0.00	0.06	7.41	68.04	0.00	0.00	3.54	38.98	44.73	31.06	17.87
LKM		MIDDEN	7	0.00	0.00	0.00	1.11	42.03	0.00	0.00	8.51	62.56	16.07	16.21	2.99
LKM		OCCUPATION	12	0.53	0.50	0.04	3.95	85.58	0.00	0.00	5.64	64.13	54.62	7.50	7.46
LKM		OFRENDA	3	0.16	0.00	0.16	0.98	29.99	0.33	0.00	96.63	12.80	8.46	9.67	1.93
LKM		PIT	5	1.63	0.25	1.38	2.62	133.74	0.00	0.13	15.57	422.60	20.99	52.08	47.82
LKM		POTFILL	5	0.00	0.00	0.00	0.67	41.98	0.00	0.00	152.13	34.93	20.04	7.33	13.47
LKM		TRASHPIT	16	0.13	0.05	0.08	1.97	58.40	0.00	0.00	5.77	56.27	20.94	17.63	8.77

SUM OF COUNT BY CROP

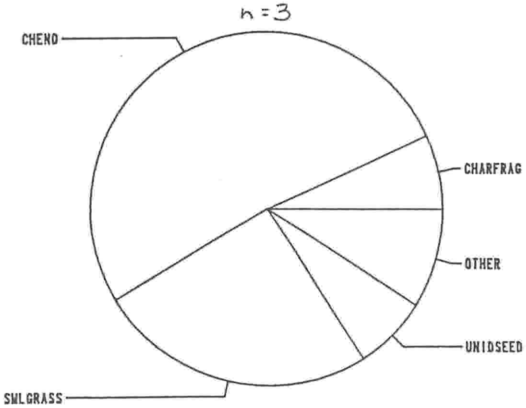
n=14

CONTEXT = BURIAL



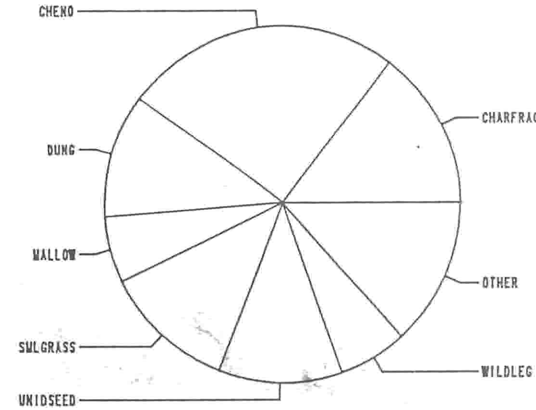
CONTEXT = FILL

n=3

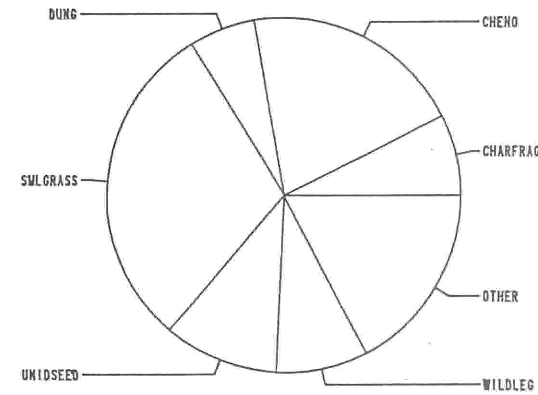


SUM OF COUNT BY CAMP

CONTEXT = HEARTH n = 10



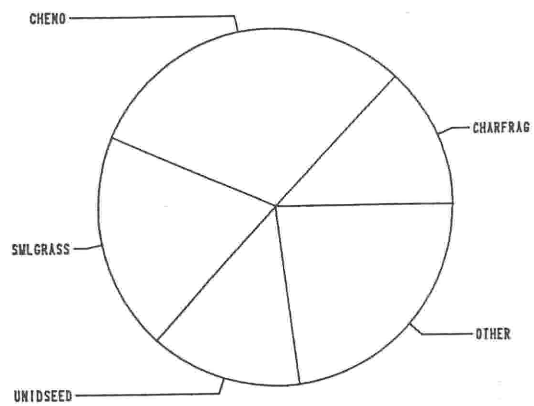
CONTEXT = MIDDEN n = 7



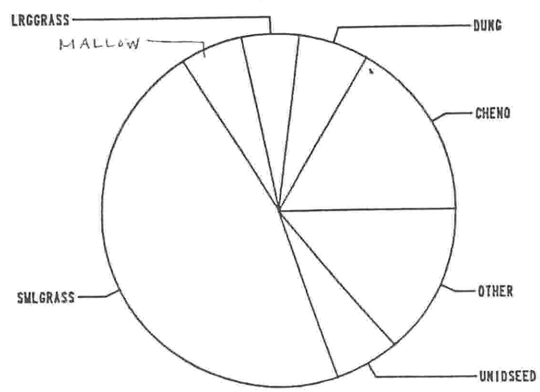
SUM OF COUNT BY CROP

n = 12

CONTEXT = OCCUPATION

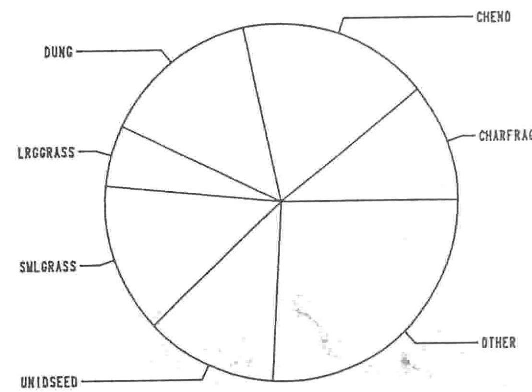


CONTEXT = PIT n = 5

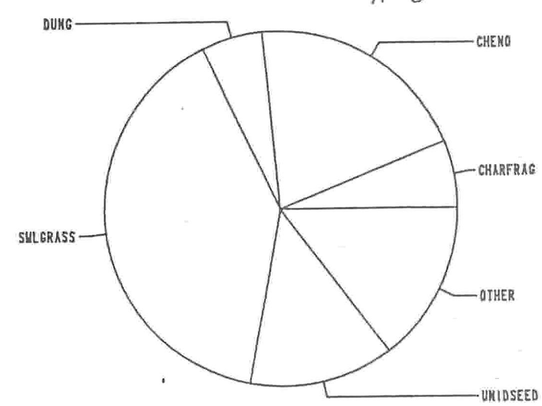


SUM OF COUNT BY CROP

CONTEXT = (missing) n = 37



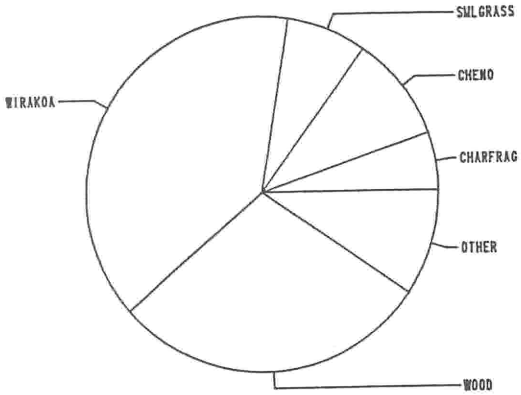
CONTEXT = ASHDEPOSIT n = 8



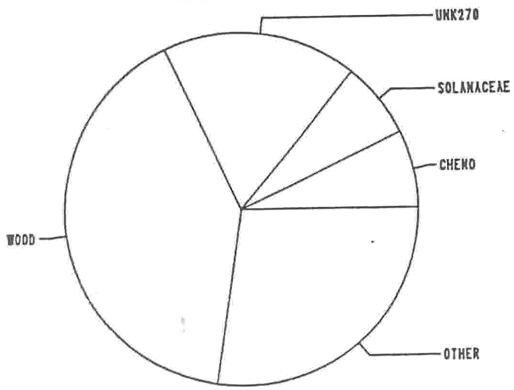
SUM OF COUNT BY CROP

n=3

CONTEXT = OFRENDA



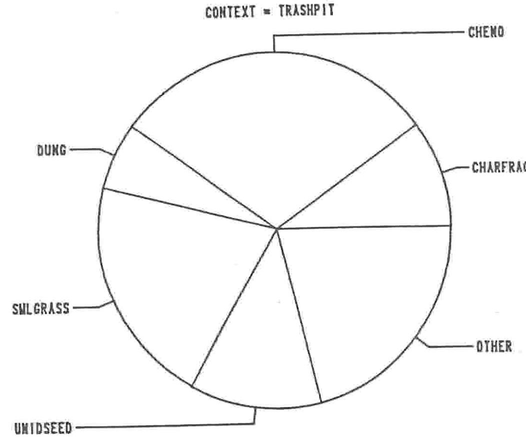
CONTEXT = POTFILL n=5



SUM OF COUNT BY CROP

n = 16

CONTEXT = TRASHPIT



comparison to other sites in the area Lukurmata can be seen to have fairly large quantities of food remains, second only to the various parts of the site of Tiwanaku proper. It appears that a fair amount of maize and *Chenopodium* (especially the large-seeded type) were used or consumed at the site. Ubiquity scores indicate that the crops were also more widespread than at other smaller valley sites (such as those excavated by Juan Albarracin-Jordan and Jim Matthews), but again, Tiwanaku itself has remains more widely distributed. This suggests that the people at Lukurmata had adequate access to domesticated foodstuffs. Unlike other Andean ares we have studied in the UM lab (such as the Jauja area sites), Lukurmata has more fragments of maize *kernels* than *cobs*. It may be that less maize was grown in the area and that it was transported after shelling elsewhere. This is not surprising as maize can only be grown with great care on Isla del Sol or the raised fields, and is usually quite small. One possible process to help determine whether or not the maize is locally produced would be a study of projected kernels size and row number, based on the available fragments (see Johannessen and Hastorf 1989).

Remains of charred wood are quite common and they are denser at Lukurmata than they are at all the other sites we have investigated in the area. Grass seeds are and dung also denser than at other sites. Perhaps the areas investigated at Lukurmata contain more contexts where burning took place. This has not yet been determined and will require more detailed contextual and spatial analysis. In any event, it appears that fuel was available, although the wide variety of possible sources exploited may suggest that it was a prized and scarce commodity.

At Lukurmata the greatest concentrations of food remains are found in the ash pits, occupation zones, and midden. This pattern is not the same as that of the Tiwanaku samples, where the densest remains are normally associated with large trash pits. In contrast, the trash pits at Lukurmata do not contain particularly dense materials. It is possible that domestic refuse was disposed of in a more haphazard fashion at Lukurmata. This could be a function of a number of different actions. At Lukurmata there may have been more open space than at the core of the urban center surrounding the Akapana mound. People at Lukurmata may have been free to dispose of plant trash in less prescribed areas. This might possibly be related to simple site hygiene. On the other hand it may go deeper into the lifestyle at the site. Certainly the houses discovered at Lukurmata by Bermann are less formal and rigid in their construction canons than those at Putuni and other areas of Tiwanaku proper. Yet some ash deposit in the site may be from something such as hearth cleaning (hearths have low densities of plants), suggesting that the inhabitants of Lukurmata were not without rules or notions concerning trash disposal.

Individual context groups also show varied patterns. Lukurmata is unique in the strong presence of Wira Koa (an herb used today in Pachamama offerings) in both the burial and other "ofrenda" contexts. We do not see such a striking correlation in other sites. This suggest that this plant (the scientific names is unfortunately unknown) was important in rituals as far back as the Tiwanaku III time period. This is impressive evidence for a possible long-term historical association between the people and the earth goddess. The fact that this is somewhat unique to Lukurmata--and does not match the llama (and tuber) offering found on the summit of the Akapana by Linda Manzanilla--suggests that rituals took many forms and were not mandated to be identical at all Tiwanaku installations.

In short it appears that Lukurmata contained many of the same types of deposits, and hence represent some of the same type of activities going on elsewhere in the valley, especially at the Tiwanaku center. As predicted, Lukurmata appears to contain more plant materials than smaller hinterland sites, but less that at Tiwanaku. This helps confirm its intermediate status between the sites of higher and lower rank (size and status-wise). The access of the residents to all food types, the occurrence of special botanical offerings also highlight the unique and important nature of the center of Lukurmata.

APPENDIX: RAW DATA
CODES USED FOR WILA JAWIRA COMPUTER INPUT:

IDNO = This is used for identification in the botanical lab
SITE
CUADRA
NIVEL = level
SPECIMEN = the bag number assigned in the field
UNIDAD1 = The North unit designation
UNIDAD2 = The East unit designation
RASGO = feature
FLOTNUM = The flot number assigned in the field
FLOTVOL = Volume of sample in liters (as collected in the field)
LFPICK = Weight of carbon sorted out of the sample
COLLTYPE = whether sample is BULK (101) or PINCH (102). Screen material (1/4") is 201
CULTCONT = Three digit code for cultural context of sample. Check raw data sheet for definitions. This information is taken directly from tags on samples and/or field notes.
CARD/CRD/CRDNO/CARDNO = These are for data loading (ignore).
BOXSIZE= Size of storage box used for sample
YEAR= Year sample collected

Taxa names refer to different identifiable plant parts:

LRGCHENO = *Chenopodium* spp. L. seeds larger than 1.18 mm
SMLCHENO = *Chenopodium* spp. seeds smaller than 1.18mm
LUMP = Unidentifiable fragment of charred plant tissue
SPOACEAE = Small Grass family seeds (Poaceae)
LPOACEAE = Large Grass family seeds (Poaceae)
WILDLEG = Wild seeds from the Bean family (Leguminosae or Fabaceae)
SCIRPUS = *Scirpus* spp. L. Seeds of tortora reeds
VERBENA = *Verbena* spp. L.
PLANTAGO = *Plantago* spp. L.
MALVACEA = Mallow family (Malvaceae)
RELBUN = *Relbunium* spp. Hook.
MPOACEAE = Medium Grass family seeds (Poaceae)
RUBUS = *Rubus* spp. L.
CYPERAC = Sedge family (Cyperaceae)
CRUCIFER = Mustard family (Cruciferae or Brassicaceae)
UNK224 = Unknown seed #224
POTAMOG = Pondweed, *Potamogeton* spp. (Tourn) L.
CEREUS = *Cereus* spp. Mill.
UNK264 = Unknown seed #264
MODPOPPY = Modern poppy seeds added as check on flot machine
AMARANTH = *Amaranthus* spp. L.
UNK270 = Unknown seed #270
UNK242 = Unknown seed #242
COMPOSIT = Sunflower family (Compositae or Asteraceae)
UNK265 = Unknown seed 265
LABIATAE = Mint family
KAINYA = Aymara name, scientific name unknown
UNK261 = Unknown 261
JUNCUS = *Juncus* spp. L.

UNK248 = Same as *Rubus* spp.
CARYOPHL = Caryophyllaceae (Pink family)
UNK266 = Unknown 266
SOLANAC = Solanaceae seeds (Nightshade family)
NICOTIAN = *Nicotiana* spp. L.
SISYRINC = *Sisyrinchium* spp. L.
ZEAKERN= *Zea mays* L. kernels
ZEAEMBR = *Zea mays* embryos apart from kernels
COBCUP = *Zea mays* cob and cob fragments
CAPSICUM = *Capsicum* spp. L. Chili peppers
DOMLEGUM = Domesticated legumes exact genus unknown
POLYGON = Polygonaceae (Knotweed family)
OXALIS = *Oxalis* spp. L.
UNK202 = Unknown seed 202 (probably Borage family, Boraginaceae)
OENOTHER = *Oenothera* spp. L.
LSOLANAC = Large seeds of Nightshade family, possibly *Solanum* spp.
UNK271 = Unknown 271
UNK235 = Unknown 235
PORTULAC = *Portulaca* spp. L.
UNK201 = Unknown 201
TRITHORD = *Triticum* spp. L. (Wheat) or *Hordeum* spp. L. (Barley) both introduced by the Spanish from the Old World
CACTUS = Cactaceae, exact genus unknown
UNK279 = Unknown seed 279
UNIDSEED = Seeds too poorly preserved to identify to family level
TUBER = Domesticated tubers, exact taxon not identifiable
WOODCT = Count of wood fragments
WOODWT = Weight of wood fragments in grams
TWGBRNCH = Twig and branches (showing nodes)
STALK = Stalks
DUNG = Animal dung, type undefinable
LLAMADNG = Camelid dung
CUYDUNG = Cuy dung
WIRAKOA = Aymara name, leaves used in *Pachamama* rituals
LEAVES = Leaves, exact taxon unknown
TRITRACH = *Triticum* spp. or *Hordeum* spp. rachis
SORTTYPE = Number refers to sorting strategy used in the laboratory, see preceding pages
FAUNAL = 0= No bones or fish scales; 1= Bones and/or fish scales present

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IDNO	SITE	CUADRA	NIVEL	SPECIMEN	UNIDAD1	UNIDAD2	RASGO	FLOTNUM	FLOTVOL	LFPICK	COLLTYPE	COLCONT	CARD	LRGCHENO	SMLCHENO	LUMP	SPOACEAE	LPOACEAE
420	LKM			05773				4178	2.1	0.6	101	342	1	.	1	6	1	.
425	LKM	NORT	006					4198	1.8	1.8	101	.	1	8	292	139	92	8
400	LKM			07193	N2365	E2858		4150	1.3	2.8	101	.	1	1	18	36	140	16
311	LKM		006	07175	N2365	E2888		4194	1.8	1.3	101	297	1	1	49	50	170	21
312	LKM		008	07192	N2365	E2888		4161	2.1	1.6	101	700	1	4	56	10	135	6
347	LKM	B	004	07108	N2365	E2888		4185	2.1	0.3	101	360	1	1	4	4	3	2
348	LKM		007	07185	N2365	E2888		4175	1.8	1.8	101	240	1	3	29	46	69	5
313	LKM			07211	N2365	E2892	5	4131	2.3	5.1	101	301	1	34	252	357	428	121
349	LKM			07213	N2365	E2892	5	4022	1.0	2.2	101	342	1	12	95	112	47	10

WILDLEG	SCIRPUS	VERBENA	PLANTAGO	MALVACEA	RELBUN	MPOACEAE	RUBUS	CYPERAC	CRUCIFER	UNK224	POTAMOG	CEREUS	UNK264	CRD	MODPOPPY	MODUMBEL	AMARANTH	UNK270	UNK242	COMPOSIT	UNK265	LABIATAE	KAINYA	UNK261	JUNCUS	UNK248	CARYOPHL	UNK266	SOLANAC	NICOTIAN	SISYRINC	ZEAKERN	ZEAEMBR	COBCUP	CAPSICUM	DOMLEGUM
.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	16	4	16	2	12	1	.	.	.	.	.	.	.	.	1	.	1	.	.
15	.	.	.	20	.	.	4	.	.	.	.	.	.	2	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
77	.	26	.	6	18	.	.	24	.	4	.	72	.	2	.	.	.	.	2	.	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
32	.	13	.	1	6	.	2	5	.	.	.	1	.	2	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	9	.	6	7	.	6	4	.	6	.	3	.	2	.	.	.	1	.	3	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
.	.	1	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	5	.	1	6	.	.	10	.	8	.	6	.	2	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
205	.	16	.	24	153	4	8	16	.	8	.	.	.	2	.	.	.	12	.	.	3	.	.	.	.	.	.	.	.	.	.	6	.	.	.	.
17	.	5	.	29	10	1	11	7	.	.	.	.	1	2	.	.	.	1	.	.	1	.	.	2	.	1	1	2	.	.	.	.	.	.	.	.

[illegible]	POLYGON	OXALIS	UNK202	OENOTHER	LSOLANAC	UNK271	UNK235	PORTULAC	UNK201	TRITHORD	CACTUS	CARDNO	UNIDSEED	TUBER	WOODCT	WOODWT	TWGBRNCH	STALK	DUNG	LLAMADNG	CUYDUNG	WIRAKOA	LEAVES	TRITRACH	SORTTYPE	FAUNAL	BOXSIZE	YEAR	LRGLUMP	SMLLUMP	PHASE	UNK279	PEDUNCLE	BORAGE	UNK305	CDNUM
3	.	.	.	.	.	.	.	.	.	.	.	4	1	.	4	0.1	.	.	.	.	.	1	.	.	1	1	S	.	0	6		.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	4	117	.	8	0.1	19	.	9	.	.	.	.	.	2	1	M	.	27	112		.	.	.	.	.
3	.	.	.	.	2	.	.	.	.	.	.	4	56	.	30	0.3	.	.	25	.	.	.	4	.	2	1	M	87	3	33		.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	4	72	.	7	0.1	.	.	1	.	.	.	.	.	2	1	M	87	0	50		.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	4	80	.	6	0.1	5	.	55	.	.	.	.	.	1	1	M	87	0	10		.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	1	1	S	87	0	4		.	.	.	.	.
3	.	.	.	7	.	.	.	.	.	.	.	4	62	.	7	0.1	.	.	.	.	.	.	.	.	2	1	M	87	1	45		.	.	.	.	.
3	.	.	.	.	.	.	8	8	.	.	.	4	300	.	24	0.1	.	.	12	.	.	.	.	.	2	1	M	87	37	320		.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	4	22	.	17	0.1	2	.	13	.	.	.	.	.	1	1	M	87	2	110		.	.	.	.	.

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                S                                     C  C     L   S        S L
                P    U    U            F    F         O  U     R   M        P P
       C        E    N    N            L    L     L   L  L     G   L        O O
       U    N   C    I    I   R        O    O     F   L  T     C   C        A A
I   S  A    I   I    D    D   A        T    T     P   T  C  C  H   H   L    C C
D   I  D    V   M    A    A   S        N    V     I   Y  O  A  E   E   U    E E
N   T  R    E   E    D    D   G        U    O     C   P  N  R  N   N   M    A A
O   E  A    L   N    1    2   O        M    L     K   E  T  D  O   O   P    E E

401 LKM        07212 N2365 E2892 5      4085 2.1  2.6 101 340 1  23  208  95  400 12
309 LKM     005 06162 N2365 E2894       4073 1.6  0.7 101 620 1   3   21  35   33  4
343 LKM B   006 06127 N2367 E2890 5     4114 0.3  1.1 101 415 1   .    7  54    9  .
308 LKM     004 06111 N2367 E2892 3     4080 2.3  2.5 101 460 1 135  628 142  448  2
342 LKM     004 06112 N2367 E2892 3     4218 0.3  1.2 101 700 1   4   94  30   43  .
307 LKM     007 05183 N2368 E2886 2     4063 1.6  8.3 101 412 1  44 1200 125 1000 79
340 LKM     005 05171 N2368 E2886       4055 1.3  2.3 101 240 1   3  202  16  200  2
341 LKM     005 05172 N2368 E2886       4020 1.6  2.4 101 410 1   1  241  56  138 12
436 LKM        06087 N2368 E2886 4      4109 1.8  4.1 101 410 1   9  700  80 3000 14

        P  M    M      C          M M A    C   L          C    N S    C D
W  S  V L  A    P    C R  P       O O M    O   A          A  S I I Z Z  A O
I  C  E A  L   R O   Y U U O C U  D D A U  U M U B  K U J U R U O C S E E C P M
L  I  R N  V   E A R P C N T E N  P U R N  N P N I  A N U N Y N L O Y A A O S L
D  R  B T  A   L C U E I K A R K  O M A K  K O K A  I K N K O K A T R K E B I E
L  P  E A  C   B E B R F 2 M E 2 C P B N 2  2 S 2 T  N 2 C 2 P 2 N I I E M C C G
E  U  N G  E   U A U A E 2 O U 6 R P E T 7  4 I 6 A  Y 6 U 4 H 6 A A N R B U U U
G  S  A O  A   N E S C R 4 G S 4 D Y L H O  2 T 5 E  A 1 S 8 L 6 C N C N R P M M

.23 8  32 .  28  92 4   4 20 4 . . . . 2 . . . 16 . 4  1 36  . . . . . . . . 1 6 . . . . .
13 .   1 .   3   . .   1 . . . . . . 2 . . . . . . . . . . . . . . . . . . . . . . . .
 . 1   . .   .   2 .   . . . . . . . 2 . . . . . . . . . 2 . . . . . . . . . . . . . .
.23 .  32 .  . 136 .   8 16 . . . . 8 2 . . . 1 . . . . . 1 . . 8 . . . . . 6 1 . . . .
16 .   6 .  12  13 3   . 3 . . . . 1 2 . . . . . . . . . . . . . . . . . . . . . . . .
15 . 120 . 180  28 . 136 4 8 . . 4 . 2 . . . . . . 42 . 20 . . 8 . . . 88 . . . . . .
70 .   9 .  10   3 2   7 12 . . . 2 1 2 . . 1  5 . 7 18  1 . . . . . . . . . . . . . .
14 .   4 .  17   4 1   3 12 1 2 . 2 1 2 . . 1  7 2 8  . . . . . . . . . . . . . . . 1
48 .  24 . 200   4 .  16 . . . . . . 2 . . . . 4 . 56 . 1 . . . . . . 8 . . . . . . .

     O L     P    T      U        T       L      T S           P
 P   E S     O    R      N        W       L C W  R O  B   L  S  E
 O O U N O  U U R U  I C C  I  W  W  G       A U I L I R F O  R  M  U D B U
: L X N O L  N N T N  T A A  D T O  O  B  S    M Y R E T T A X  G  L P N U O N C
: Y A K T A  K K U K  H C R  S U O  O  R  T  D A D A A R T U S Y L  L H K N R K D
) G L 2 H N  2 2 L 2  O T D  E B D  D  N  A  U D U K V A Y N I E U  U A 2 C A 3 N
: O I O E A  7 3 A O  R U N  E E C  W  C  L  N N N O E C P A Z A M  M S 7 L G O U
) N S 2 R C  1 5 C 1  D S O  D R T  T  H  K  G G G A S H E L E R P  P E 9 E E 5 M

; . . . . . . . . . . . . 4  42 . 17 0.1 24 .   5 . . . . . 2 1 M 87 17  78   . . . . .
; . . . . . . . . . . . . 4  20 . 15 0.1  . .   . . . . . . 1 1 S 87  0  35   . . . . .
; . . . . 4 . . . . . . . 4   6 . 23 0.3  . .   7 . . . . . 1 1 S 87  4  50   . . . . .
; . . 8 . 1 16 . . . . . . 4 243 . 14 0.1  6 .  50 . . 9 . . 2 1 M 87  5 137   . . . . .
; . . . . . . 1 . . . . . 4  60 . . . . . .   2 . . . . . 1 1 S 87  1  29   . . . . .
; . . . 4 2 . 4 . . . . . 4 606 . 95 0.9 43 . 400 5 . 80 . . 2 1 L 87 23 102   . . . . .
; . . 2 . . . . . . . . . 4  40 . 27 0.3  . .  75 . . 1 . . 1 1 M 87  0  16   . . . . .
; . . . 1 . . . . . . . . 4  75 . 23 0.4  6 .  25 . . . . . 1 1 M 87  5  51   . . . . .
; . . . . 1 . . . . 153 . 4 308 . 37 0.3  7 . 425 . . . . . 2 1 L 87  5  75   . . . . .
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                  S                                     C  C     L  S        S  L        P M   M      C          M M
                  P     U     U          F  F           O  U     R  M        P  P    W S V L  A   P    C R  P       O O
      C           E     N     N          L  L      L    L  L     G  L        O  O    I C E A  L R O   Y U U O C U   D D
      U    N      C     I     I    R     O  O      F    L  T     C  C        A  A    L I R N  V E A R P C N T E N   P U
I  S  A    I      I     D     D    A     T  T      P    T  C  C  H  H  L     C  C    D R B T  A L C U E I K A R K   O M
D  I  D    V      M     A     A    S     N  V      I    Y  O  A  E  E  U     E  E    L P E A  C B E B R F 2 M E 2 C P B
N  T  R    E      E     D     D    G     U  O      C    P  N  R  N  N  M     A  A    E U N G  E U A U A E 2 O U 6 R P E
D  E  A    L      N     1     2    O     M  L      K    E  T  D  O  O  P     E  E    G S A O  A N E S C R 4 G S 4 D Y L

334 LKM SOPA      04621 N2369 E2880 STRUCT1 4193 1.8  1.2 101 420 1  .  43  22   18  2  12 .  . . 1 3 .  . 1 . . . . . 2 . .
333 LKM SOPA      04619 N2369 E2884 STRUCT1 4037 1.6  1.5 101 420 1  .  45  21   15  .  22 1  2 . 2 6 .  1 3 . 3 . . . 2 . .
335 LKM           04623 N2369 E2884 STRUCT1 4132 2.1  1.3 101 420 1  2  52  43   29  .  23 .  4 . 2 5 .  1 1 . 1 . 1 . 2 . .
822 LKM SUPA      04620 N2369 E2884         4019 2.1  1.0 101 420 1  4  27  17   37  2  25 .  3 . 2 5 .  . 3 . . . . . 2 . .
331 LKM           04003 N2369 E2885         4358 0.3  0.1 101 420 1  .   .   0    1  .   . .  . . . . .  . . . . . . . 2 . .
306 LKM           04871 N2369 E2886         4187 1.6  1.7 101 700 1  3 200  41  250 15  10 .  8 . 11 3 . 6 1 . . . . . 2 . .
339 LKM           05149 N2369 E2886         4108 1.8  1.5 101 460 1  . 744 260 2120 .   . . 16 . 64 . . 16 . . . . 8 . 2 . .
315 LKM       002 07584 N2369 E2888 3       4072 1.6  1.9 101 700 1  .  23  39  300  1  75 .  3 . 3 5 .  1 16 . . . . . 2 . .
316 LKM       002 07585 N2369 E2888 3       4077 2.3  3.0 101 700 1  2   4  26  500  8 127 .  . . 2 10 . 4 24 . . . . 2 2 . .
422 LKM       004 07582 N2369 E2888 3       4216 1.8  3.6 101 415 1  4  28 121  240  5  60 .  . . 8 4 .  . 8 . 4 . . 8 2 . .
354 LKM       001 07583 N2369 E2898 3       4002 1.6 17.6 101   . 1  1  26 119  401 17  93 .  8 . 8 4 2  2 40 . 4 . . . 2 . .
382 LKM       001 02841 N2371 E2881 4       4467 1.8  1.9 101   . 1 10  90 132   92  7  36 .  4 . 2 12 . 8 12 . . . . 2 2 . .
304 LKM           03153 N2371 E2884 2       4476 1.8  1.4 101   . 1  1  24  69   10  1   . .  2 . 2 . .  . 1 . . . . . 2 . .
305 LKM           03154 N2371 E2884 3       4411 1.6  4.3 101   . 1  1  80 232  160  8 160 .  4 . 12 . . . 60 . . . . . 2 . .
427 LKM       005 02228 N2371 E2884 1       4147 1.6  2.1 101 700 1  3  52  36   30 89  36 .  6 . 20 18 . 2 18 . . . . 4 2 . .
353 LKM       004 07552 N2373 E2888         4030 1.6  2.0 101   . 1  .  29  27   19  4   . .  4 . 4 2 1  2 1 . . . . . 2 . .
350 LKM       001 07217 N2373 E2894 1       4162 2.1  0.8 101 422 1  .   4 104   18  4   . .  . . . . .  . . . . . 2 . 2 . .
346 LKM       004 07076 N2377 E2894 1       4136 1.8  0.9 101 415 1  1  34  17    9  1   2 .  . . 8 2 .  1 2 . . . . . 2 . .
387 LKM           03418 N2525 E3153         4449 0.5  0.0 101 598 1  .   .   0    .  .   . .  . . . . .  . . . . . . . 2 . .

    C   L        C    N S     C D       O L    P  T       U          T       L      T S          P
    O   A        A   S I I Z Z A O    P   E S    O  R       N          W       L C  W R O   B    L  S  E
 U U M  U B K U J U R U O C S E E C P M  O O U N O U U R U I C C     I   W W     G       A U  I L I R F O    R  M  U D B U
 N N P  N I A N U N Y N L O Y A A O S L C L X N O L N N T N T A A     D T  O O    B S     M Y  R E T T A X    G  L P N U O N C
 K K O  K A I K N K O K A T R K E B I E R Y A K T A K K U K H C R     S U  O O    R T   D A D  A A R T U S Y  L  L H K N R K D
 2 2 S  2 T N 2 C 2 P 2 N I I E M C C G D G L 2 H N 2 2 L 2 O T D     E B  D D    N A   U D U  K V A Y N I E  U  U A 2 C A 3 N
 7 4 I  6 A Y 6 U 4 H 6 A A N R B U U U N O I O E A 7 3 A O R U N     E E  C W    C L   N N N  O E C P A Z A  M  M S 7 L G O U
 0 2 T  5 E A 1 S 8 L 6 C N C N R P M M O N S 2 R C 1 5 C 1 D S O     D R  T T    H K   G G G  A S H E L E R  P  P E 9 E E 5 M

 . . 4  5 . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4  14 .  4 0.2  . .   1 . . 6 . . 1 1 M 87  0  22  . . . . .
 . . .  . . . . . 1 . . . . . . . . . . 3 . . . . . . . . . . . . . 4  30 .  7 0.1  . .  61 . . 25 . . 1 1 S 87  5  16  . . . . .
 1 . .  . . . . . . . . . . . . . . . . 3 . . . . . . 1 . . . . . . 4  30 .  4 0.1  2 .   . . . 3 . . 1 1 S 87  1  42  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4  20 . 10 0.1  . .  20 . . . . . 1 1 S 87  0  17  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4   . .  . .    . .   . . . . . . 1 . S 87  0   0  . . . . .
 . 1 3  2 . . . . . . . 1 . . . . . . . 3 . . . . . . . 1 . . . . . 4  75 2  6 0.2  . .  50 . . 3 . . 1 1 M 87  0  41  . . . . .
 . . .  26 . . 8 . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4 416 . 32 0.3  . .  26 . . . . . 1 1 M 87  3 257  . . . . .
 5 . .  1 . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4  50 . 37 0.3  5 . 138 . . 12 . . 1 1 S 87  4  35  . . . . .
 . . .  3 . . . . . . . . . . 5 . . . . 3 . . . . . . . . . . . . . 4 250 . 43 0.3  3 . 210 . . 8 . . 1 . M 87  6  20  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4  96 . 32 0.5 21 .  39 2 . 5 . . 2 . M 87 13 108  . . . . .
 36 . . 5 . . . . . . . . . . 7 . 1 1 . 3 . . . . . . . . . . . . . 4 122 . 42 0.8  4 . 228 . . . . 2 2 1 L 87 24  95  . . . . .
 . . 4  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4  60 . 20 0.2  . . 165 . . . 4 . 2 1 M 86  2 130  . . . . .
 . . .  . . 1 . . . . . . . . 1 . . . . 3 . . . . . . . . . . . . . 4  10 . 35 0.2 21 .   4 . . . . . 1 1 M 86  1  68  . . . . .
 . . .  10 . 4 . 4 . . . . . . 1 . . . . 3 . . . . . . . . . . . . . 4 240 . 50 0.3 18 . 817 . . 20 . . 2 . M 86  7 225  . . . . .
 6 . .  3 . . . . . . . . . . . . . . . 3 . . . . 1 . 2 . . . . . . 4  96 . 34 0.2  5 .   9 . . . . . 2 . M 86  1  35  . . . . .
 1 . 2  . . . . . . . . . . 2 . . . . . 3 . . . . . . . . . . . . . 4  25 .  2 0.1  . .  13 . . . . . 1 1 S 87  2  25  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4   8 .  . .   23 5   . . . . . . 2 1 M 87  9  95  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . 2 . . . . . . . . . . 4  11 .  3 0.1  2 .   . . . . . . 1 1 S 87  2  15  . . . . .
 . . .  . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . . 4   . .  . .    . .   . . . . . . 1 . S  .  0   0  . . . . .
```

```
                S                          C   C   L S   S L     P M  M     C      M M A
                P    U   U     F   F       O   U   R M   P P W S V L  A  P   C R  P    O O M
      C         E    N   N     L   L   L   L   L   G L   O O I C E A  L R O  Y U U O C U  D D A U U
      U  N      C    I   I   R O   O   F   L   T   C C   A A L I R N  V E A R P C N T E N  P U R N N
:  S  A  I      I    D   D   A T   T   P   T   C C H H L C C D R B T  A L C U E I K A R K  O M A K K
)  I  D  V      M    A   A   S N   V   I   Y   O A E E U E E L P E A  C B E B R F 2 M E 2 C P B N 2 2
\  T  R  E      E    D   D   G U   O   C   P   N R N N M A A E U N G  E U A U A E 2 O U 6 R P E T 7 4
)  E  A  L      N    1   2   O M   L   K   E   T D O O P E E G S A O  A N E S C R 4 G S 4 D Y L H 0 2

404 LKM  004 01140 N2526 E3153      4526 1.6 0.5 101 412 1 . 14 21 13 1  4 . . .  1 . . .  . . . . . . . 2 . . . 1 .
418 LKM  001 05602 N2558 E3136 16HE 4180 0.8 0.8 101 598 1 .  8  7  3 1  6 . 1 .  . 1 1 1  . . . . . . . 2 . . . . .
432 LKM      05100 N2558 E3160 16HE 4065 1.3 1.4 101   . 1 . 20  3 96 1 15 . . .  . 4 . 9  6 . 2 . 6 . . 2 . . . 2 .
434 LKM  001 05601 N2558 E3163 16HE 4067 1.3 1.5 101   . 1 . 25  6 40 2 26 . 2 . 10 5 . 1 26 . 4 . 1 . . 2 . . . 1 .
338 LKM      05130 N2559 E3137 HE6  4032 1.3 0.3 101   . 1 .  4  5 . . . . . . . . . . . . . . . . . . . 2 . . . . .
337 LKM      05088 N2559 E3151 HE12 4103 0.5 0.1 101   . 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
417 LKM      05089 N2559 E3151      4089 2.1 0.1 101 598 1 .  2  1 . . . . . . . . . . . . . . . . . . . 2 . . . . .
336 LKM      05059 N2559 E3153 HE4  4028 0.5 2.3 101 598 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
416 LKM      05058 N2559 E3153 4HE  4049 2.3 0.1 101 598 1 .  .  0 . .  1 . . . . . . . . . . . . . . . . 2 . . . . .
410 LKM      05073 N2559 E3157 12HE 4040 0.3 0.1 101 498 1 .  .  1  1 . . . . . . . . . . . . . . . . . . 2 . . . . .
351 LKM  003 07227 N2567 2890  4    4018 1.8 1.1 101   . 1 . 22 19 24 1  3 . 2 .  2 1 . 1  3 . . . . . . 2 . . . 1 .
379 LKM  008 01563 N2577 E3151 3    4069 1.6 1.1 101 412 1 2 64 79 34 6 15 . 3 . 16 5 . .  7 . . . . . . 2 . . . . .
390 LKM  004 03426 N2577 E3151      4498 1.3 0.0 101 412 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
391 LKM  002 03424 N2577 E3151      4405 0.3 0.3 101 342 1 .  8  6  4 .  4 . 2 . . . . .  1 . . . . . . 2 . . . . .
384 LKM  020 03411 N2577 E3153      4469 1.3 0.0 101 342 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
386 LKM  020 03416 N2577 E3153      4493 2.3 0.1 101 342 1 .  .  1  1 . . . . . . . . . . . . . . . . . . 2 . . . . .
388 LKM  020 03419 N2577 E3153      4412 1.8 0.0 101 298 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
396 LKM  022 03540 N2577 E3153      4496 1.0 0.0 101 650 1 .  .  0 . . . . . . . . . . . . . . . . . . . 2 . . . . .
406 LKM  012 02012 N2577 E3153      4144 1.8 1.3 101 412 1 . 69 13 11 3  5 . 2 .  3 5 . .  6 . 1 . . 1 2 . . . . .

 L         C   N S     C D       O L     P   T     U           T       L     T S           P
 A         A  S I I Z Z  A O   P    E S     O   R     N           W       L C W  R O   B    L S    E
U B K U J U R U O C S E E C P M  O O U N O U U R U I C C I    W  W  G      A U I L I R F O   R M   U D B U
N I A N U N Y N L O Y A A O S L C L X N O L N N T N T A A D  T  O  O  B S   M Y R E T T A X   G L  P N U O N C
K A I K N K O K A T R K E B I E R Y A K T A K K U K H C R S  U  O  O  R T  D A D A A R T U S  Y L L  H K N R K D
2 T N 2 C 2 P 2 N I I E M C C G D G L 2 H N 2 2 L 2 0 T D E  B  D  D  N A  U D U K V A Y N I  E U U  A 2 C A 3 N
6 A Y 6 U 4 H 6 A A N R B U U U N O I 0 E A 7 3 A 0 R U N E  E  C  W  C L  N N N O E C P A Z  A M M  S 7 L G O U
5 E A 1 S 8 L 6 C N C N R P M M O N S 2 R C 1 5 C 1 D S O D  R  T  T  H K  G G G A S H E L E  R P P  E 9 E E 5 M

. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4 10 .  .   .   . .   . . . . . . 1 1 S  . 1 20  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  4 .  .   .   . .   . . . . . . 1 1 S 87 0  7  . . . . .
. . . . . . . . . . . . 1 . . . . 3 . . . . . . . . . . . . 4 30 .  6 0.1   6 .   4 . . . . . 2 1 M 87 0  3  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4 33 .  8 0.1   1 . 292 . . 3 . . 2 . L 87 0  6  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  2 .  .   .   1 .   . . . . . . 1 1 S 87 0  5  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 1 S 87 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  1 .  1 0.1   . .   . . . . . . 1 . S 87 0  1  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 1 M 87 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  3 0.1   . .   . . . . . . 1 1 S 87 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 . S 87 0  1  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4 12 .  4 0.2   2 .   . . . . . . 1 1 S 87 0 19  . . . . .
. . . . . . . . . . . . . . 2 . . 3 . . . . . . . . . . . . 4 38 .  3 0.1   . .   . . . . . . 1 . S 86 4 75  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 . S 86 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  8 .  1 0.1   . .   . . . . . . 1 1 S 86 0  6  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 . S 86 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 . S 86 0  1  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 1 S 86 0  0  . . . . .
. . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  . .  .   .   . .   . . . . . . 1 . S 86 0  0  . . . . .
. . . . . . . . 1 . . . . . . . . 3 . . . . . . . . . . . . 4 25 . 10 0.1   1 .   6 . . . . . 1 1 S 86 1 12  . . . . .
```

```
                S                                  C   C     L  S      S  L          P  M    M      C            M M A
                P     U     U     F    F           O   U     R  M      P  P   W S  V L  A    P    C R   P        O O M
        C       E     N     N     L    L   L       L   L     G  L      O  O   I C  E A  L  R O    Y U U O C  U   D D A U
      U   N     C     I     I  R  O    O   F       L   T     C  C      A  A   L I  R N  V  E A R  P C N T E  N   P U R N
    S A   I     I     D     D  A  T    T   P       T   C  C  H  H   L  C  C   D R  B T  A  L C U  E I K A R  K   O M A K
    I D   V     M     A     A  S  N    V   I       Y   O  A  E  E   U  E  E   L P  E A  C  B E B  R F 2 M E  2 C P B N 2
    T R   E     E     D     D  G  U    O   C       P   N  R  N  N   M  A  A   E U  N G  E  U A U  A E 2 O U  6 R P E T 7
    E A   L     N     1     2  O  M    L   K       E   T  D  O  O   P  E  E   G S  A O  A  N E S  C R 4 G S  4 D Y L H O

576 LKM  007 01330 N2579 E3152    4340 0.8 0.5 101 412 1  .  10  7  1  .   1 .  . .  1  . . .  2 . . . .  . 2 . . . .
577 LKM  007 01331 N2579 E3152    4459 1.3 0.6 101 412 1  .  11 32  6  .   4 .  . .  1  1 . .  2 . 1 . .  . 2 . . . .
578 LKM  007 01559 N2579 E3152 5  4151 1.3 0.1 101 598 1  .   .  0  1  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
405 LKM  006 01327 N2579 E3152    4183 2.1 0.9 101 412 1  .  41 27 13  .   2 .  2 .  1  3 . 1  2 . . . .  . 2 . . . .
575 LKM  008 01299 N2581 E3151    4342 1.3 0.7 101 412 1  .   2  8  3  1   2 .  . .  .  . . .  . . 1 . .  . 2 . . . .
597 LKM  004 03543 N2581 E3151    4505 0.3 0.1 101 298 1  .   .  0  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
585 LKM  009 03413 N2581 E3153    4423 0.5 0.0 101   . 1  .   .  0  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
589 LKM  011 03420 N2583 E3151    4519 0.8 0.0 101 650 1  .   .  0  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
581 LKM      02723 N2585 E3150    4489 2.1 0.0 101   . 1  .   .  0  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
407 LKM  010 02422 N2585 E3150    4048 1.3 1.2 101 412 1  .  25 20 27  2   6 .  1 .  4  4 . 1  4 . . . .  . 2 . . . .
415 LKM      02722 N2585 E3150    4447 1.9 0.0 101   . 1  1   .  2  1  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
380 LKM      02714 N2585 E3152 2  4479 0.3 0.1 101 598 1  .   .  1  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
408 LKM      02726 N2585 E3152 2  4407 2.1 0.1 101 598 1  .   .  4  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
383 LKM  005 03406 N2585 E3153 2  4410 0.3 0.1 101 598 1  .   .  1  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
392 LKM  001 03427 N2585 E3153    4488 1.6 0.2 101 412 1  .   1  5  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
393 LKM  002 03428 N2585 E3153    4468 0.3 0.2 101 412 1  .   . 11  1  .   1 .  . .  .  . . .  . . . . .  . 2 . . . .
394 LKM  003 03429 N2585 E3153    4515 1.0 0.3 101 412 1  .   1  3  2  .   1 .  . .  1  . . .  . . . . .  . 2 . . . .
395 LKM  004 03430 N2585 E3153    4511 1.3 0.0 101 412 1  .   .  0  .  .   . .  . .  .  . . .  . . . . .  . 2 . . . .
414 LKM  005 02408 N2585 E3153 2  4422 1.3 0.2 101 598 1  .   1  1  .  .   . .  . .  .  . . .  1 . . . .  . 2 . . . .

C L         C   N S     C D       O L     P   T     U         T     L       T S       P
O A         A  S I I Z Z A O  P    E S     O   R     N         W     L C  W  R O  B  L  S  E
M U B K U J U R U O C S E E C P M  O O U N O U U R U I C C  I   W W   G     A U  I L I R F O  R  M  U D B U
P N I A N U N Y N L O Y A A O S L C L X N O L N N T N T A A  D T  O O   B S   M Y  R E T T A X  G  L P N U O N C
O K A I K N K O K A T R K E B I E R Y A K T A K K U K H C R  S U  O O   R T  D A D  A A R T U S Y L  L H K N R K D
S 2 T N 2 C 2 P 2 N I I E M C C G D G L 2 H N 2 2 L 2 O T D  E B  D D   N A  U D U  K V A Y N I E U  U A 2 C A 3 N
I 6 A Y 6 U 4 H 6 A A N R B U U U N O I O E A 7 3 A O R U N  E E  C W   C L  N N N  O E C P A Z A M  M S 7 L G O U
T 5 E A 1 S 8 L 6 C N C N R P M M O N S 2 R C 1 5 C 1 D S O  D R  T T   H K  G G G  A S H E L E R P  P E 9 E E 5 M

. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   2 .  .   .    . .  . . .  . . . 1 . S 86 0   7   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  12 .  .   .    . .  . . .  . . . 1 1 S 86 2  30   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  17 .  3 0.1    . .  1 . .  . 1 . 1 1 S 86 0  27   . . . . .
. . . . . . . . . . . . . 1 . . . . 3 . . . . . . . . . . . . 4   4 .  1 0.1    . .  . . .  . . . 1 . S 86 1   7   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   1 .  .   .    . .  . . .  . . . 1 1 S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  10 .  5 0.1    3 .  3 . .  . . . 1 1 S 86 0  20   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   2 .  .   .    . .  . . .  . . . 1 . S 86 0   2   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   1   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   1 .  1 0.1    . .  . . .  . . . 1 1 S 86 1   3   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   1   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 1 S 86 0   5   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   9 .  .   .    . .  . . .  . . . 1 . S 86 0  11   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   3   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  . . . 1 . S 86 0   0   . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .    . .  . . .  86 . . 1 1 S 86 0   1   . . . . .
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                S                                     C   C   L   S       S  L              P    M     M       C                   M M A
                P   U     U      F   F                O   U   R   M       P  P      W S   V L    A     P    C  R    P              O O M
    C           E   N     N      L   L   L            L   L   G   L       O  O      I C   E A    L  R  O    Y  U  U O C  U         D D A U
    U N         C   I     I   R  O   O   F            L   T   C   C       A  A      L I   R N    V  E  A  R P  C  N T E  N         P U R N
I S A I         I   D     D   A  T   T   P            T   C C H   H   L   C  C      D R   B T    A  L  C  U E  I  K A R  K         O M A K
D I D V         M   A     A   S  N   V   I            Y   O A E   E   U   E  E      L P   E A    C  B  E  B R  F  2 M E  2 C       P B N 2
N T R E         E   D     D   G  U   O   C            P   N R N   N   M   A  A      E U   N G    E  U  A  U A  E  2 O U  6 R       P E T 7
O E A L         N   1     2   O  M   L   K            E   T D O   O   P   E  E      G S   A O    A  N  E  S C  R  4 G S  4 D       Y L H O

3428 LKM   010 03012 N2587 E3146    4074 2.5 1.6 101    . 1  1  52  39  53   .  26 .  3 .   4  4  .  . 13 .  2 . 1  6 2  . . . .
3413 LKM   002 00805 N2587 E3148    4188 2.5 1.3 101    . 1  1  12  41  20   .  12 .  1 .   2  2  .  1  . .  1 . .  1 2  . . . .
3426 LKM   008 00618 N2587 E3148    4068 1.6 1.4 101    . 1  2  80  36  55   7  12 .  5 .   6  1  .  1 17 .  . . 2  4 2  . . . .
3429 LKM       04752 N2842 E2913 21 4045 1.8 3.3 101    . 1  9 164  11  80  69  82 . 16 .   8 12  .  4 32 .  . . .  . 2  . . . .
3328 LKM       01983 N2875 E2881 1  4371 1.0 1.2 101 593 1  2  19  30  15   3   1 1  5 .   .  1  .  4  . .  . . .  . 2  . . . 1
3329 LKM       01984 N2875 E2881 1  4366 1.3 1.5 101 593 1  5  47  11  20   2   9 .  8 .  10  4  1  8  3 .  . . .  3 2  . . . 2
3356 LKM       07758 N2880 E2907 1  4003 1.6 5.0 101 420 1 99 696 104 148  49 203 8 28 . 127 28  .  4 48 .  . . . 16 2  . . 8 .
3314 LKM       07298 N2884 E2911 2  4196 2.3 1.4 101 420 1  8 135  29  27  10   . 1  1 .  86  .  .  3  3 . 48 . .  . 2  . . . .
3352 LKM       07297 N2884 E2911 1  4001 2.3 2.8 101 420 1  9  88   3 116  19   4 .  . .  40  .  . 12  4 .  4 . .  . 2  . . 4 .
3363 LKM   024 09349 N2884 E2915    4170 0.3 0.2 101    . 1  .   2  15   .   .   1 .  . .   1  .  .  .  . .  . . .  . 2  . . . .
3327 LKM       01684 N2886 E2821 4  4497 0.3 0.2 101 598 1  .   3   3   1   .   1 .  . .   .  .  .  .  . .  . . .  . 2  . . . .
3326 LKM       01679 N2886 E2824 1  4210 0.5 6.5 101 498 1  .   3  19   4   .   . .  . .   2  .  .  .  1 1  . . .  . 2  . . . 1
3424 LKM       10418 N2886 E2909 5  4106 2.6 2.6 101    . 1 66 600 510 320 271   . .  8 .   .  8 16 64 16 .  . . .  . 2  . . . .
3437 LKM       06423 N2886 E2909 1  4141 1.6 5.6 101 420 1  5 120 456 201   4  44 .  . .  64  .  .  .  9 8  . . .  . 2  . . . 4
3355 LKM       07619 N2886 E2913 1  4034 0.8 0.6 101    . 1  .   3   0   1   .   1 .  1 .   2  .  .  1  . .  . . .  . 2  . . . .
3364 LKM   028 09396 N2886 E2917    4171 0.3 0.6 101 344 1  .   5  10   .   .   1 .  . .   2  .  .  .  . .  . . .  . 2 48 . . .
3365 LKM   028 09397 N2886 E2917    4487 2.6 0.9 101 344 1  3  23 122  11   4   . 3  . .   1  .  .  .  . .  . . .  . 2  . . . .
3301 LKM       02608 N2890 E2819 3  4513 2.3 0.8 101 423 1  .  12   5  31   6  11 .  2 .   1  3  .  .  1 .  . . . 10 2  . . . .
3330 LKM       02607 N2890 E2819 3  4404 2.3 1.0 101 420 1  .   9  17   7   2   3 .  . .   2  1  .  2  1 .  . . .  . 2  . . . 1
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 C L         C   N S       C D        O L    P   T        U          T      L         T S         P
 O A         A  S I I Z Z  A O  P     E S    O   R        N          W      L C  W    R O   B  L  S   E
U M U B K U J U R U O C S E E  C P M  O O U N O U U R U I C C    I      W W   G    A U  I  L I R F O  R  M  U D B U
N P N I A N U N Y N L O Y A A  O S L C L X N O L N N T N T A A    D T    O O   B S    M Y  R  E T T A X  G  L P N U O N C
K O K A I K N K O K A T R K E  B I E R Y A K T A K K U K H C R    S U    O O   R T  D A D  A  A R T U S Y  L  L H K N R K D
2 S 2 T N 2 C 2 P 2 N I I E M  C C G D G L 2 H N 2 2 L 2 O T D    E B    D D   N A  U D U  K  V A Y N I E  U  U A 2 C A 3 N
4 I 6 A Y 6 U 4 H 6 A A N R B  U U U N O I O E A 7 3 A O R U N    E E    C W   C L  N N N  O  E C P A Z A  M  M S 7 L G O U
2 T 5 E A 1 S 8 L 6 C N C N R  P M M O N S 2 R C 1 5 C 1 D S O    D R    T T   H K  G G G  A  S H E L E R  P  P E 9 E E 5 M

. . 1 . . . . . . . . . . . .  1 . . 3 . . . . . . . . . . . . 4  37 .   7 0.1  . .   3 . . .  . . 2 1 M 86  4  35  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4  14 .   4 0.1  . .   9 . . 1  . . 1 1 M 86  3  38  . . . . .
. . . . . . . . . . . . . . 1  . . . 3 . . . . . . . . . . . . 4  30 .   6 0.1  . .  10 . . .  1 . 1 . S 86  1  35  . . . . .
. . 1 . . . . . . . . . . . .  . . . 3 . . . . . . 4 . . . . . 4  38 .  85 0.9 65 .  16 . . .  . . 2 1 M 86  1  10  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4  11 .   9 0.1  . .   3 . . .  . . 1 1 S 86  0  30  . . . . .
. . . . . . . 1 . . . . . . .  . . . 3 . . . . . . . . . . . . 4  25 .  21 0.2  8 .   1 . . 3  . . 1 1 M 86  0  11  . . . . .
. . . . . . . . . . . . . . .  1 . . 3 2 4 . . . . . . . . . . 4 339 .  39 0.4 15 .  83 . . .  . . 2 1 L 87  0 104  . . . . .
1 . . . . . . . . . . 2 . . .  . . . 3 . . . . . . . . . . . . 4  30 .   5 0.1  1 .   5 . . 5  . . 1 1 S 87  2  27  . . . . .
. . . . . . . 8 . . . 2 . . .  . . . 3 . . . . . . . . . . . . 4   1 .   . .    3 . 200 . . .  . . 2 1 L 87  0   3  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   . .   2 0.1  1 .   . . . .  . . 1 1 S 87  0  15  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   . .   1 0.1  . .   . . . .  . . 1 1 S 86  0   3  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   3 . 372 5.8  . .   . . . .  . . 1 1 L 86  0  19  . . . . .
. . 1 . 5 . . . . . . . . . .  . . . 3 . . . . . . . 8 . . . . 4 400 5 117 0.5 54 . 594 . . .  24 . 2 . L 87  0 510  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4 124 .   . .   80 . 265 . . 42  . 8 2 . M 87 33 423  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   . .   1 0.1  . .   . . . .  . . 1 1 S 87  0   0  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   1 .   5 0.2  . 1   . . . .  . . 1 1 M 87  0  10  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4   2 .   7 0.2  4 .   . . . 1  . . 1 1 M 87  2 120  . . . . .
. . 1 . . . . . . . . . . . .  . . . 3 . . . . . . . . . . . . 4  15 .  14 0.2  . .   2 . . .  . . 1 1 S 86  0   5  . . . . .
. . . . . . . . . . . . . . .  . . . 3 . . 2 . . . . . . . . . 4  10 .   2 0.1  . .   . . . .  . . 1 1 S 86  2  15  . . . . .
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IDNO	SITE	CUADRA	NIVEL	SPECIMEN	UNIDAD1	UNIDAD2	RASGO	FLOTNUM	FLOTVOL	LFPICK	COLLTYPE	CULTCONT	CARD	LRGCHENO	SMLCHENO	LUMP	SPOACEAE	LPOACEAE	WILDLEG	SCIRPUS	VERBENA
3303	LKM			02674	N2890	E2821	1	4475	1.3	1.3	101	423	1	1	49	5	18	3	2	.	2
3300	LKM	006		02605	N2890	E2823	1	4099	1.6	2.5	101	499	1	7	176	20	176	349	34	4	30
3302	LKM	006		02608	N2890	E2823	1	4430	0.5	.	101	.	1	3	55	9	8	10	22	.	18
3325	LKM			01436	N2892	E2823	3	4154	0.3	0.1	101	594	1	.	1	2	.	.	.	.	1
3344	LKM			06458	N2892	E2907	1	4042	0.8	1.1	101	.	1	.	8	4	2	.	1	.	1
3332	LKM			04132	N2892	E2915	3	4506	0.3	0.3	101	.	1	.	1	4	1	1	.	.	1
3398	LKM	001		04166	N2892	E2915		4512	2.6	1.0	101	.	1	.	18	40	9	1	7	.	1
3318	LKM	033		09432	N2892	E2917		4458	3.0	0.6	101	.	1	.	3	6	6	2	.	.	.
3359	LKM			08607	N2894	E2715	5	4220	0.3	0.4	101	.	1	.	5	13	5	.	2	.	1

PLANTAGO	MALVACEA	RELBUN	MPOACEAE	RUBUS	CYPERAC	CRUCIFER	UNK224	POTAMOG	CEREUS	UNK264	CRD	MODPOPPY	MODUMBEL	AMARANTH	UNK270	UNK242	COMPOSIT	UNK265	LABIATAE	KAINYA	UNK261	JUNCUS	UNK248	CARYOPHL	UNK266	SOLANAC	NICOTIAN	SISYRINC	ZEAKERN	ZEAEMBR	COBCUP	CAPSICUM	DOMLEGUM	CRDNO	POLYGON	OXALIS
.	3	1	.	.	.	.	.	.	.	2	2	47	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	187	10	.	4	.	3	6	.	.	.	2	46	.	.	4	.	.	.	.	1	.	.	.	.	.	.	.	.	2	.	11	.	.	3	.	.
.	10	.	.	.	2	.	1	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	1	.	.	1	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	1	.	.	1	.	.	.	.	1	.	2	49	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	3	.	.
.	1	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.
.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.

UNK202	OENOTHER	LSOLANAC	UNK271	UNK235	PORTULAC	UNK201	TRITHORD	CACTUS	CARDON	UNIDSEED	TUBER	WOODCT	WOODWT	TWGBRNCH	STALK	DUNG	LLAMADNG	CUYDUNG	WIRAKOA	LEAVES	TRITRACH	SORTTYPE	FAUNAL	BOXSIZE	YEAR	LRGLUMP	SMLLUMP	PHASE	UNK279	PEDUNCLE	BORAGE	UNK305	CDNUM
.	.	.	.	.	.	.	.	.	4	20	.	.	.	3	.	4	.	.	1	.	.	2	1	M	86	0	5	.	.	.	.	.	.
1	.	.	.	.	.	.	.	.	4	35	.	25	0.2	7	.	13	.	.	.	.	.	2	1	M	86	0	20	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	27	.	3	0.1	2	.	98	.	.	.	.	.	1	.	S	86	1	8	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	1	1	S	86	0	2	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	6	.	5	0.2	.	.	.	.	.	.	.	.	1	1	S	87	1	3	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	1	1	S	87	0	4	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	11	.	7	0.1	.	.	.	.	.	.	.	.	1	1	M	87	0	40	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	.	.	2	0.1	.	.	.	.	.	.	.	.	1	1	M	87	0	6	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	4	3	.	.	.	.	.	.	.	.	.	.	.	1	1	S	.	0	13	.	.	.	.	.	.

IDNO	SITE	CUADRA	NIVEL	SPECIMEN	UNIDAD1	UNIDAD2	RASGO	FLOTNUM	FLOTVOL	LFPICK	COLLTYPE	CULTCONT	CARD	LRGCHENO	SMLCHENO	LUMP	SPOACEAE	LPOACEAE	WILDLEG	SCIRPUS
423	LKM			08642	N2894	E2911	5	4081	1.8	4.1	101	.	1	24	825	61	700	27	300	.
320	LKM		034	09978	N2894	E2915		4129	1.8	2.4	101	.	1	12	102	126	60	141	20	.
402	LKM		024	09348	N2894	E2915		4448	0.3	0.4	101	498	1	.	6	2	2	1	.	.
310	LKM			06804	N2894	E2917	3	4176	2.1	1.9	101	410	1	3	17	25	23	6	34	.
825	LKM		20	06803	N2894	E2917	3	4016	1.8	2.6	101	410	1	3	20	2	2	2	21	1
366	LKM		031	09567	N2894	E2919		4076	0.3	1.4	101	.	1	1	31	13	1	3	1	.
360	LKM		022	08841	N2894	E2923		4208	0.3	1.6	101	498	1	1	55	15	35	11	28	.
361	LKM		022	08861	N2894	E2925		4120	2.3	0.4	101	.	1	.	6	4	2	.	.	.
362	LKM		023	09158	N2894	E2925		4113	0.3	0.7	101	.	1	.	6	8	1	.	.	1

[illegible]	PLANTAGO	MALVACEA	RELBUN	MPOACEAE	RUBUS	CYPERAC	CRUCIFER	UNK224	POTAMOG	CEREUS	UNK264	CRD	MODPOPPY	MODUMBEL	AMARANTH	UNK270	UNK242	COMPOSIT	UNK265	LABIATAE	KAINYA	UNK261	JUNCUS	UNK248	CARYOPHL	UNK266	SOLANAC	NICOTIAN	SISYRINC	ZEAKERN	ZEAEMBR	COBCUP	CAPSICUM	DOMLEGUM	CRDNO
34	.	502	32	.	120	200	40	12	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.	.	154	2	.	.	6	.	.	.	.	2	2	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.	.	.	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.0	.	1	.	.	1	2	.	2	.	.	4	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.	.	.	.	.	1	.	.	2	.	1	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
3	.	1	3	.	.	2	.	1	1	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
1	.	19	6	.	.	20	.	3	.	.	1	2	.	.	.	5	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
.	.	.	1	.	.	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3

[illegible]	OXALIS	UNK202	OENOTHER	LSOLANAC	UNK271	UNK235	PORTULAC	UNK201	TRITHORD	CACTUS	CARDNO	UNIDSEED	TUBER	WOODCT	WOODWT	TWGBRNCH	STALK	DUNG	LLAMADNG	CUYDUNG	WIRAKOA	LEAVES	TRITRACH	SORTTYPE	FAUNAL	BOXSIZE	YEAR	LRGLUMP	SMLLUMP	PHASE	UNK279	PEDUNCLE	BORAGE	UNK305	CDNUM
.	.	.	.	.	.	.	.	.	.	.	4	804	.	9	0.3	97	.	207	.	.	25	.	.	2	1	M	87	4	57		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	40	.	84	0.9	7	.	2	.	.	.	.	.	2	1	M	87	25	101		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	2	.	.	.	.	.	1	1	S	87	0	2		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	5	.	41	0.4	54	.	.	.	.	.	4	.	2	1	M	87	0	25		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	.	.	14	0.2	27	.	1	.	.	.	.	.	1	1	M	87	0	2		.	.	.	.	.
.	.	.	.	.	1	.	.	.	.	.	4	3	.	1	0.1	.	.	2	.	.	.	.	.	1	1	S	87	0	13		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	40	.	5	0.2	10	.	9	.	.	.	.	.	1	1	S	87	0	15		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	.	.	5	0.2	.	.	.	.	.	.	.	.	1	1	S	87	0	4		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	4	.	.	1	0.1	1	.	.	.	.	.	.	.	1	1	S	87	1	7		.	.	.	.	.

IDNO	SITE	CUADRA	NIVEL	SPECIMEN	UNIDAD1	UNIDAD2	RASGO	FLOTNUM	FLOTVOL	LFPICK	COLLTYPE	CULTCONT	CARD	LRGCHENO	SMLCHENO	LUMP	SPOACEAE	LPOACEAE	WILDLEG	SCIRPUS
317	LKM		021	08500	N2896	E2913		4138	4.4	2.6	101	497	1	2	42	56	80	1	4	.
357	LKM		021	08499	N2896	E2913		4121	2.1	1.2	101	497	1	1	24	14	18	3	1	.
358	LKM		021	08501	N2896	E2913		4021	1.0	2.6	101	497	1	2	69	6	8	2	4	.
321	LKM		029	10177	N2896	E2915		4057	1.6	1.1	101	297	1	2	76	11	117	17	8	.
319	LKM		034	09954	N2896	E2917		4078	1.8	2.3	101	342	1	14	1100	244	324	37	36	28
367	LKM		029	09814	N2896	E2917		4111	0.3	0.6	101	342	1	.	12	24	8	.	.	1
368	LKM		029	09815	N2896	E2917		4122	2.6	1.0	101	342	1	2	51	62	67	.	2	1
369	LKM		031	09824	N2896	E2917		4173	1.8	4.5	101	.	1	5	281	51	18	455	5	.
322	LKM		020	10931	N2899	E2999		4128	2.3	2.3	101	.	1	.	18	15	28	.	4	.

VERBENA	PLANTAGO	MALVACEA	RELBUN	MPOACEAE	RUBUS	CYPERAC	CRUCIFER	PUNK224	OTAMOG	CEREUS	UNK264	CRD	MODPOPPY	MODUMBEL	AMARANTH	UNK270	UNK242	COMPOSIT	UNK265	LABIATAE	KAINYA	UNK261	JUNCUS	UNK248	CARYOPHL	UNK266	SOLANAC	NICOTIAN	SISYRINC	ZEAKER	ZEAEMB	COBCUR	CAPSICUP	DOMLEGUM	CRDNO	POLYGON
.	.	6	.	.	.	4	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	3	.
.	.	3	.	.	1	3	.	.	.	.	.	2	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	.
.	.	3	.	.	.	.	.	1	.	.	.	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
.	.	13	8	.	.	12	.	.	.	.	5	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
12	.	52	28	.	4	28	.	.	.	.	6	2	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
.	.	.	.	.	.	1	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
.	.	2	1	.	.	4	.	.	1	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.
2	.	107	3	.	21	90	10	.	.	.	517	2	.	.	.	6	2	.	.	.	.	.	.	.	.	1	14	.	.	.	.	.	.	.	3	.
1	.	.	1	.	1	.	.	.	.	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.

DXALIS	UNK202	OENOTHER	LSOLANAC	UNK271	UNK235	PORTULAC	UNK201	TRITHORD	CTCTUS	CARDNO	UNIDSEED	TUBER	WOODCT	WOODWT	TWGBRNCH	STALK	DUNG	LLAMADNG	CUYDNG	WIRAKOA	LEAVES	TRITRACH	SORTTYPE	FAUNAL	BOXSIZE	YEAR	LRGLUMP	SMLLUMP	PHASE	UNK279	PEDUNCLE	BORAGE	UNK305	CDNUM
.	.	.	.	.	.	.	.	.	.	4	16	.	138	1.1	10	.	.	.	.	270	.	.	2	1	M	87	16	40		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	.	.	41	0.2	1	.	.	.	.	38	.	.	1	1	S	87	0	14		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	36	1	239	1.1	3	.	29	.	.	253	.	.	1	1	M	87	6	0		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	10	.	8	0.1	.	.	24	10	.	.	.	.	1	1	S	87	11	0		.	.	.	.	.
.	.	.	1	.	.	.	.	.	.	4	650	.	4	0.1	25	.	125	.	.	28	.	.	2	1	M	87	14	230		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	2	.	.	.	.	.	.	.	.	.	.	.	1	1	S	87	3	21		.	.	.	.	.
.	1	.	.	.	.	.	.	.	.	4	19	.	14	0.2	1	.	.	.	.	.	.	.	1	1	M	87	1	61		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	84	.	20	0.3	20	1	303	.	.	.	.	.	2	1	M	87	22	29		.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	4	6	.	16	0.2	2	.	1	.	.	.	.	.	1	1	M	87	0	15		.	.	.	.	.

```
                  S                         C    C    L  S        S  L          P M    M     C           M  M A
                  P    U    U     F    F    O    U    R  M        P  P W  S V   L A    P   C R   P        O  O M
        C         E    N    N     L    L  L L    L    G  L        O  O I  C E   A L  R O  Y U U O C U     D  D A   U
        U    N    C    I    I  R  O    O  F L    T    C  C        A  A L  I R   N V  E A R P C N T E N    P  U R   N
I   S   A    I    I    D    D  A  T    T  P T    C C  H  H    L   C  C D  R B   T A  L C U E I K A R K    O  M A   K
D   I   D    V    M    A    A  S  N    V  I Y    O A  E  E    U   E  E L  P E   A C  B E B R F 2 M E 2 C  P  B N   2
N   T   R    E    E    D    D  G  U    O  C P    N R  N  N    M   A  A E  U N   G E  U A U A E 2 O U 6 R  P  E T   7
O   E   A    L    N    1    2  O  M    L  K E    T D  O  O    P   E  E G  S A   O A  N E S C R 4 G S 4 D  Y  L H   0

3370 LKM      020 10916 N2899 E2999    4104 2.3 2.2 101    . 1  3 116  44  51  8 14 2 13 . 13  4 1 6 19 . 5 . 1 3 2 . . . .   .
3371 LKM      020 10918 N2899 E2999    4133 2.1 1.1 101    . 1  .  32  32   4  6  4 .  1 .  1  3 . 2  3 . 2 . . 1 2 . . . .   .
3372 LKM      020 10922 N2899 E2999    4101 0.5 0.6 101    . 1  .  29  80   4  3  . .  . .  1  . . . . . 2 1 . . 2 . . . .   .
3324 LKM S2   007 01094 N2964 E3092    4408 0.8 0.0 101    . 1  .   .   0   .  .  . .  . .  .  . . . . . . . . . 2 . . . .   .
3421 LKM          05796 N2965 E3105    4190 1.8 0.1 101 498 1  .   1   4   .  .  . .  . .  .  . . . . . . . . . 2 . . . . 160
3323 LKM      007 00189 N3039 E3120 1  4023 0.5 1.7 101 298 1  1  24  20  17  8 24 .  1 .  2  . . 2  1 . 1 . . . 2 . . . .   .
3345 LKM NORT 004 06583 N3277 E3226 2  4025 1.8 1.0 101 342 1  1  24   7  12  .  . 1  . .  2  . . . . . . . . . 2 46 30 .   .
3403 LKM NORT 004       N3277 E3226 1  4051 2.1 1.3 101 310 1  1  76  16  14  4  6 .  1 .  3  1 . 1 . . 2 . 1 1 2 . . . .   .
3823 LKM NORT 7   06586 N3277 E3226 1  4000 2.1 1.4 101 342 1  1  46  15  51  2  5 1  . .  6  3 . 1 1 . . . 1 1 2 . . . .   1
3824 LKM NORT 7   06587 N3277 E3226 1  4015 1.8 1.4 101 342 1  4 155  26  78  2  . .  1 .  4  . . . 6 . . . 4 2 2 . . . 1   2
3433 LKM NORT 005 05367 N3281 E3219 3  4064 2.1 0.9 101 342 1  .  68   5  70  .  2 .  . . 13  2 . . . . . . . . 2 49 30 .   .
3411 LKM NORT 004 05693 N3281 E3223    4039 1.6 1.9 101 342 1 10 258  49  64 53  . .  4 . 24  8 . . . . . . . . 2 . . . .   .
3435 LKM NORT 006 05685 N3281 E3228 1  4053 2.3 1.6 101 342 1 39 200  13 180 28 22 .  4 . 24 20 . . 4 . . . . . 2 . . . .   .
3419 LKM NORT 007 05637 N3281 E3230 21 4046 2.1 3.4 101 412 1 19 680 197 192  1 20 .  . .  8  8 . . . . 8 . 8 . 2 . . . .  16
3430 LKM NORT 005 04940 N3281 E3230    4059 2.3 1.0 101 330 1  .  90  18  45  2  3 .  . . 11  4 . . . . . . . . 2 . . . .   4
3431 LKM NORT 006 04994 N3281 E3230    4050 2.3 1.0 101 626 1  7 376  19 168  .  . .  . .  .  . . . . . . . . . 2 . . . .   .
3399 LKM NORT 014 06719 N3283 E3228    4142 0.8 0.5 101    . 1  .   .   3   3  .  2 .  1 .  1  . . . . . 1 . . . 2 . . . .   .
3412 LKM NORT 004 04829 N3287 E3221 1  4061 2.3 1.8 101    . 1  7 112 135  96  8  4 .  . . 52  4 . 4 9 . . . . . 2 . . . .   8
3409 LKM NORT 004 04252 N3287 E3225    4520 2.1 1.2 101 342 1  .  95  34  75  2  5 .  . .  9  2 . . 12 1 . . 1 . 2 . . . .   2

 C   L         C     N S     C D       O L     P   T       U           T      L       T S              P
 O   A         A   S I I Z Z A O   P   E S     O   R       N           W      L C  W  R O  B     L  S  E
JM U B K U J U R U O C S E E C P M  O O U N O U U R U I C C I   W  W   G      A U  I L I R F O   R  M  U D B U
NP N I A N U N Y N L O Y A A O S L C L X N O L N N T N T A A D T O  O   B S  M Y  R E T T A X   G  L P N U O N C
KO K A I K N K O K A T R K E B I E R Y A K T A K K U K H C R S U O  O   R T D A D A A R T U S Y L  L H K N R K D
2S 2 T N 2 C 2 P 2 N I I E M C C G D G L 2 H N 2 2 L 2 O T D E B D  D   N A U D U K V A Y N I E U  U A 2 C A 3 N
4I 6 A Y 6 U 4 H 6 A A N R B U U U N O I O E A 7 3 A O R U N E E C  W   C L N N N O E C P A Z A M  M S 7 L G O U
2T 5 E A 1 S 8 L 6 C N C N R P M M O N S 2 R C 1 5 C 1 D S O D R T  T   H K G G G A S H E L E R P  P E 9 E E 5 M

. 1 . 1 1 1 . . 1 . . . 3 . . . . . 3 . . . . . . . . . . . . 4  96 . 12 0.2  3 . 1 . . . . . 1 1 M 87  1  43 . . . . .
. . 2 . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   2 .  1 0.1  . . 1 . . . . . 1 1 S 87  2  30 . . . . .
. . . . . . 1 . . . . . . . . . . . 3 . . . . . . . . . . . . 4  10 .  .   .  . . . . . . . . 1 1 S 87  0  80 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .  . . . . . . . . 1 . M 86  0   0 . . . . .
4 . 3 . 3 . . . . . 64 . . . . . . . 3 . . . . . . . . . . . . 4   . .  .   .  . . . . . . . . 1 . S 87  0   4 . . . . .
. 1 . 1 6 . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  17 . 13 0.2  . . 16 1 . . . . 1 1 S 86  0  20 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   1 .  1 0.1  . . 2 . . . . . 1 1 S 87  0   7 . . . . .
. . 1 . 1 . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  11 .  .   .  2 . . . . . . . 1 1 S 87  1  15 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  32 .  .   .  3 . . . . . . . 1 1 M 87  1  14 . . . . .
. . . . . . 1 . . . . . . . . . . . 3 . . . . . . . . . . . . 4  30 .  .   .  . . . . . . . . 1 1 S 87  1  25 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  17 .  1 0.1  1 . . . . . . . 1 1 S 87  0   5 . . . . .
. . 1 . . . . . . . . . . . . . . . 3 . . . . 1 . . . . . . . 4 102 .  3 0.1 23 . 17 1 . . . . 1 . M 87  5  44 . . . . .
. . 12 . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  52 .  2 0.1  8 . 5 . . . . . 2 1 M 87  3  10 . . . . .
. . 3 . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  65 . 37 0.4 150 . 6 . . . . . 2 1 L 87 11 186 . . . . .
. . . . . . . . . . 2 . . . . . . . 3 . . . . . . . . . . . . 4   3 .  6 0.1  3 . 1 . . 13 . . 1 . M 87  2  16 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  34 . 10 0.1 25 . . . . . . . 2 1 M 87  4  15 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4   3 .  .   .  . . . . . . . . 1 . S 87  0   3 . . . . .
. 4 1 . 1 . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  20 .  9 0.1  6 . 1 . . . . . 2 . M 87  2 133 . . . . .
. . . . . . . . . . . . . . . . . . 3 . . . . . . . . . . . . 4  25 .  8 0.1  5 . 1 . . . . . 1 1 M 87  9  25 . . . . .
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